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## Part II

# Early Childhood and Childhood



## Abuse During Early Childhood

Preston A. Britner<sup>1</sup>, Samantha A. Goodrich<sup>1</sup> and Sharon G. Portwood<sup>2</sup>

<sup>1</sup>Department of Human Development & Family Studies, University of Connecticut, Storrs, CT, USA

<sup>2</sup>Department of Public Health Sciences, The University of North Carolina at Charlotte, Charlotte, NC, USA

### Introduction

Previously, child abuse prevention research was fraught with problems of defining maltreatment and its subcategories as well as a lack of strong research studies documenting the effectiveness of prevention efforts. Many strides have been made in both of these areas, and, in the past decade, the field of child abuse prevention has focused on the risk factors associated with the occurrence of child maltreatment. Research suggests that there are a range of contextual and parental characteristics that put families at an increased risk for child maltreatment and involvement in the child welfare system (e.g., Begle, Dumas, & Hanson, 2010; Putnam-Hornstein, 2011).

This line of research has led to prevention efforts that have been concerned with creating a strong evidence base for programs that not only reduce the identified risk factors and cumulative stress experienced by parents but also promote healthy parenting behaviors. This strategy reflects a more comprehensive prevention approach, in which healthy family functioning is not viewed simply as the absence of problems or difficulties but rather an environment that allows children to thrive even as stressors are faced. Addressing parenting and family factors before their child is born or soon after birth enables parents to improve their interaction styles with their children and the trajectory of the family in the long term. A primary prevention approach is warranted because child abuse is pervasive, problematic, and preventable (American Psychological Association, 2009).

### Definitions and Scope

The US federal definition of child abuse and neglect, according to the Child Abuse Prevention and Treatment Act (1974), most recently reauthorized in 2010, is “any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation; or an act or failure to act, which presents an imminent risk of serious harm.” However, each state decides which situations and contexts constitute specific types of abuse and neglect, creating some ambiguity around where the lines of abuse are drawn.

In recent years, some states, such as California and Minnesota, have begun to adopt an alternative response or differential response system as a way to address some of the ambiguity around child maltreatment definitions (Conley & Berrick, 2010; U.S. Department of Health and Human Services, Children, Youth & Children’s Bureau, 2010). In this system, families at low-to-moderate risk for maltreatment and without substantiated maltreatment currently are screened out of the child protective services (CPS) system. These families receive community- and home-based services in order to redirect families from the system and hopefully decrease the likelihood of maltreatment occurring in the future (Conley & Berrick, 2010). In essence, a differential response system takes a preventive approach, recognizing that many families are stigmatized by the label of being involved in CPS, and yet many families could use services before that contact becomes necessary.

In terms of scope, CPS received just over three million reports of child maltreatment in the USA in 2009, showing a stable rate of reporting since 1996, and responded to over two million of the reported cases (U.S. DHHS, 2010). Over 700,000 of the reported cases (22.1 %) were substantiated, or 9.3 per 1,000 children were victims of abuse in the USA (U.S. DHHS). Furthermore, parents were the perpetrators of the maltreatment in 80 % of cases (U.S. DHHS). Whereas physical abuse rates have fallen, there has been an increase in neglect cases reported over the years, with more than 75 % of cases investigated including

neglect; in contrast, 15 % percent included physical abuse and 10 % included sexual abuse (U.S. DHHS). Notably, these numbers only refer to those cases that have been reported to the child welfare system. Self-report surveys indicate that the rates of child maltreatment reported by social service agencies underestimate the extent of the problem (Slep & Heyman, 2008).

Based on the available data, 33.4 % of victims are children aged zero to three (U.S. DHHS, 2010). The costs of physical abuse and neglect are particularly great for infants and young children because they are at greater risk of suffering brain dysfunction or death as a result of maltreatment. Boys were victims of maltreatment in 2009 almost as often as girls (48.2 % vs. 51.1 %, respectively), and about 11 % of victims were children with disabilities (U.S. DHHS).

Looking internationally, it is difficult to compare rates of child maltreatment in the USA with rates in other countries because definitions vary and data are compiled and reported differently. Nonetheless, according to a report from the Canadian Centre for Justice Statistics, in 2008, 451 of every 100,000 children under the age of 5 were the victims of violent crimes as reported by a sample of police departments (Ogrodnik, 2010). Assaults on children under the age of 3 were reported the least, but these assaults are reported the least as it is typically family members who are the perpetrators. Similar to the USA, a majority (75–80 %) of assaults reported were committed by individuals known by the child, typically a family member (Ogrodnik).

## Theories

Multiple theories exist to explain child maltreatment, many of which implicitly or explicitly underlie current prevention efforts. The broadest theories link child maltreatment to cultural and societal conditions (Miller-Perrin & Perrin, 1999). Some theorists propose that there is a spill-over effect from acceptable forms of violence (e.g., violence on television) to unacceptable forms of violence (e.g., child maltreatment).

Other research suggests those who turn to abuse or neglect tend to be more socially isolated (Coohey, 1996; Polansky, Gaudin, Ammons, & Davis, 1985).

Theories involving social inequality and injustice view child maltreatment within a social and ecological context, focusing on the resources and supports available to families (Garbarino & Crouter, 1978). According to strain theory, deviant behavior is more likely when people are denied access to resources (Miller-Perrin & Perrin, 1999). These theoretical perspectives cite the relationship between child maltreatment and societal and cultural conditions, such as poverty, social isolation, racism, sexism, and tolerance of violence (Daro, 1988). According to these theories, maltreatment would be decreased if resources (e.g., money, information) and supports (e.g., social support) for parents were increased and systemic changes were made (Daro). Examining the differences between low-income communities that have higher or lower rates of maltreatment, Garbarino and Kostelny (1992) found that, in low-socioeconomic status (SES), high-maltreatment neighborhoods, there was a greater sense of hopelessness and community members showed less positive neighboring. This finding suggests that even within the context of poverty and inequality, there may be a sense of community that is important to the prevention of violence.

Theories of child maltreatment also focus on the family and the individual. Learning and behavioral theories link child maltreatment to a caregiver's lack of knowledge of child development or lack of child care skills (Daro, 1988). These theories suggest maltreatment could be prevented if caregivers had the knowledge and skills necessary to care for children appropriately (Daro). In addition, cognitive-behavioral theories have pointed to a number of key cognitive processes that affect parenting behavior, which appear to be dysfunctional in parents who are perpetrators of maltreatment (Bugental & Johnson, 2000; Corcoran, 2000). Parents who abuse or neglect their children tend to attribute greater negative intention to their children's actions and view themselves as having less

control over their child's behavior than parents who have not engaged in maltreatment (e.g., Bradley & Peters, 1991; Bugental, Mantyla, & Lewis, 1989). In addition, maltreating parents tend to shower poorer problem-solving skills and less empathy towards their children (Corcoran, 2000; Feshbach, 1989).

The transactional model of child maltreatment views maltreatment as the result of interactions over time between the parent and the child within the family context; these interactions are the potential targets for prevention efforts (Wolfe, 1993). Research grounded in attachment theory supports the assertion that interactions between caregivers and children that involve maltreatment lead to disorganized patterns of attachment and an array of negative outcomes in family functioning (George, 1996; Solomon & George, 2011). According to this social learning theory, children who experience or witness violence are more likely to become violent themselves (Miller-Perrin & Perrin, 1999).

Currently, maltreatment is viewed from an ecological perspective and is seen as a multifaceted issue that results from the combination of risk factors (Black, Heyman, & Slep, 2001; Brown, Cohen, Johnson, & Salzinger, 1998). These factors include more distal factors, such as past history of abuse and the parents' history of interactions with his or her caregivers, as well as more proximal factors, such as parents' level of arousal and attributions. In addition, there are environmental-level factors, such as poverty and the parents' social network, as well as individual-level factors, such as parent-child interactions, that influence the likelihood of the occurrence of maltreatment. Begle et al. (2010) found that a cumulative risk model of abuse significantly predicted child abuse potential, suggesting that the risk for abuse increases as additional risk factors are present. Any one individual factor may not directly lead to abuse or neglect. Rather it is the combined effect of risk factors that leads to the occurrence of child maltreatment behaviors.

Individual- and family-oriented theories suggest prevention strategies such as parenting education classes, home visiting programs, and parent support groups to address a range of risk

factors that may be present within the family environment and to simultaneously strengthen protective factors that may buffer the effect of risk factors (Daro, 1988). According to these theories, changes within particular families or individuals will prevent child maltreatment.

## Current Research

In a prospective birth cohort study in California, Putnam-Hornstein (2011) found that, even after adjusting for other risk factors at birth, young children with a prior child protective service (CPS) allegation of maltreatment died at a rate 5.9 times greater than children without a prior CPS report. These data speak to the seriousness of maltreatment and the timeliness of prevention efforts in the first years of children's lives.

From a prevention perspective, research has documented that providing preventive services before maltreatment has occurred has not only physical and mental health benefits for children, as noted by Putnam-Hornstein (2011), but also monetary benefits for society. Those who have been maltreated in childhood have been shown to have greater socioeconomic disadvantage later in life (Wekerle, 2011). Furthermore, the cost of child protective service involvement, including court and lawyer fees and foster care, is much more costly than the prevention programs that could be offered prior to CPS involvement.

Although the need for child maltreatment prevention and intervention programs is well recognized and documented, the evaluation of these efforts has not shown clear indications of benefits for parents by participating in these programs. Initial evaluation studies typically did not include a comparison group. However, situational factors, such as barriers to participation and fidelity to the program curriculum, that influence the efficacy of these programs have begun to be identified and controlled for in more recent research.

As evaluations became more refined and rigorous, programs that showed benefits began to (1) address fidelity and logistic barriers consistently in their studies and (2) implement randomized control trials. Randomized control trials

(RCTs) examine the outcomes for families who participated in the program compared to those who did not receive services or, in some cases, compared to those who received “service as usual.” The outcomes tracked in the RCTs are based on the parenting and environmental factors targeted by the program, and these studies began to show that well-implemented and theoretically based programs could improve positive parenting and reduce the likelihood of maltreatment. Today, a strong evidence base is developing showing the utility and efficacy of particular prevention efforts.

In some cases randomized control trials are not possible because agencies and communities may not be able to randomly assign families to intervention or control. Although RCTs are often viewed as ideal, there is also a recognition that these programs are operating within communities, which often does not allow for the controlled process of randomization. In these situations, programs often carry out quasi-experimental studies or programs, using an already established community group that is not receiving services as a comparison. As a result, researchers are still able to garner some information about the added benefits of participating in the prevention program compared to parents who do not.

In addition, program evaluations have begun to examine process factors as well as outcomes in order to examine what enables or prevents parents from completing the program or engaging in changes in their behaviors. These studies go beyond outcome studies to offer possible suggestions as to why significant or nonsignificant results may be found. They also provide programs with feedback and ideas about how to engage parents who are often hard to reach. For an overview of factors that affect engagement, see McCurdy and Daro (2001).

## Overview of Strategies

Given that the perpetrators of maltreatment and in particular abuse are most often parents, the prevention of child maltreatment (i.e., abuse and neglect) in early childhood is fundamentally

about providing parents with the knowledge and skills to manage their anger, frustration, fatigue, and stress in ways that are safe for every member of the household. Indeed, the goal for many maltreatment prevention programs is to support parents to be better equipped to deal with the stressors of early parenthood, when the care burden is greatest and time and energy are taxed heavily. Families experiencing multiple stressors and lacking effective coping or self-regulation skills are at an increased risk for committing neglect and abuse.

## What Works

One of the most common approaches to child abuse prevention involves providing support and education to parents (American Psychological Association, 2009; Daro & Dodge, 2009). Although there is great variation in programs, these parent education and support programs have the common goal of seeking to affect the parent–child relationship early in the child’s life, before abuse can occur and before parents have established themselves in their parenting role. They also tend to be voluntary and targeted towards families at a higher risk for child maltreatment (Conley & Berrick, 2010; Guterman, 1997).

As noted, programs vary greatly in scope, intensity, duration, and format. There are two general formats that effective programs typically follow. First, there are home visiting programs, which may begin before birth or once the baby is born and last for a specified amount of time (Gomby, Culross, & Behrman, 1999; Russell, Britner, & Woolard, 2007). There are also more short-term, group-based parent education classes, many of which are manualized. These classes typically provide information about the effects of parents on children’s development and help parents build the skills necessary to provide a healthy environment for their children (Howard & Brooks-Gunn, 2009). Some programs provide only these educational or training sessions, whereas others are more comprehensive and include a number of services in addition to the parent education component. There are currently a few promising and/or

effective programs in each type of model, and the present discussion will focus on the evidence-based programs currently utilized.

The most widely known home visiting program that has been shown to be effective is the Nurse–Family Partnership (see Olds, 2006). This model, created by Olds and colleagues 30 years ago, utilizes the expertise of nurses to work with at-risk, first-time moms one-on-one. Nurses work with mothers before birth and through the first 2 years of the child’s life. This program has been shown to be effective in promoting many beneficial outcomes for mothers and children, including a greater sense of control in mothers and more stable relationships (e.g., Olds et al., 1999) and higher educational achievement and lower welfare utilization and criminal involvement for the mothers at a 19-year follow-up (Eckenrode et al., 2010). Additional randomized control trials have looked at the ability of the model to reduce child abuse and neglect and child injury and have seen beneficial outcomes in reducing the statewide rate of maltreatment cases and the number of children seen in health-care settings for injuries (Kitzman et al., 1997; Olds et al., 1997; Olds, Henderson, Chamberlin, & Tatelbaum, 1986).

Another effective home-based prevention program is SafeCare (SC), which targets environmental as well as behavioral risk factors for maltreatment in families with children under the age of five who are at high risk for maltreatment (Lutzker, Bigelow, Doctor, & Kessler, 1998). In terms of the household environment, SafeCare targets home safety and cleanliness, factors that are often a concern for families involved in the child welfare system (Silovsky et al., 2011). Behaviorally, it uses a skills-based approach to address the parenting skills that are most relevant to the occurrence of maltreatment, such as inappropriate or harsh parenting and parent–child bonding (Silovsky et al.). The program typically lasts about 15–20 weeks and is implemented by trained professionals (Lutzker et al., 1998). It can be offered as a stand-alone home visiting program or as a component of a larger program (Chaffin, Hecht, Bard, Silovsky, & Beasley, 2012).

Silovsky et al. (2011) conducted a randomized control trial of SC+, an augmented SafeCare

program that includes motivational interviewing and training in the identification of risk factors for home visitors, in a rural community with parents at risk for child maltreatment and who had children under the age of five. Data was collected at baseline, immediately following intervention completion, and approximately 6-months later. Significant differences were not found on self-reported parenting behaviors, which was likely due to the limited sample size. However, those who were randomized to SC+ were more likely to complete the program, and the SC+ participants had fewer child welfare reports post-intervention, and a longer average amount of time passed before child welfare reports were made (103 days for SC+ vs. 200.5 days for service as usual group).

Most recently, Chaffin and colleagues (2012) conducted a scaled-up, statewide randomized control trial of SafeCare across a 6-year period including 2,175 maltreating families, comparing home visiting programs that used SafeCare modules with families at high risk for maltreatment to home visiting services as usual. Results demonstrated significant main effects in favor of SafeCare, reducing child welfare reports among the SafeCare population by about 26 %. Larger effects were found among those families that fit the typical inclusion criteria for SafeCare. These studies suggest that SafeCare is an effective home visiting model for families who are at highest risk for child maltreatment and who are often the hardest to reach through parenting services.

Other home visiting programs use trained paraprofessionals to work with families. Healthy Families America (HFA) is one example of this type of program that has been used for 20 years and has been demonstrated to be effective (Harding, Galano, Martin, Huntington, & Schellenbach, 2007). Similar to the Nurse–Family Partnership model, it provides services to expectant and new parents and seeks to capitalize on the early years of the child’s life to change parenting behavior before it is strongly established. Sites vary in the population targeted and the number of home visits offered, but Hawaii’s Healthy Start Program (HSP) and Healthy Families New York (HFNY) are particular HFA programs that have

been subject to more rigorous evaluations. A randomized control trial of HFNY conducted by Rodriquez, Dumont, Mitchell-Herzfeld, Walden, and Greene (2010) found that parents who participated in HFNY showed more positive parenting and less harsh parenting than those in the control group. Duggan et al. (2004) also found moderate effects on child neglect among families enrolled in HSP. A review of HFA evaluations by Harding and colleagues (2007) revealed that five randomized control trials of HFA showed reductions in psychological aggression or neglect; three quasi-experimental studies also showed reductions on child maltreatment.

Parent–Child Interaction Therapy (PCIT) is a widely studied parent training program that works with parents one-on-one but in a center-based setting rather than in the home. Based on social learning theory, it works to change parent–child interactions by working with parents as they interact with their child, coaching parents to improve their behaviors to support child development and outcomes (Chaffin et al., 2004). PCIT is a performance-based rather than a time-based program and continues until the parent shows mastery of the skills and behavior management strategies targeted in the intervention. Although used with a variety of parents, a number of studies have evaluated the effectiveness of PCIT in preventing child maltreatment.

Chaffin and colleagues (2004) found that parents who participated in PCIT were less likely to experience re-reports of child maltreatment compared to a control group who did not receive PCIT. Interestingly, comparisons were also made between those who received just PCIT and those who received PCIT with additional services (focusing on parental depression, substance use, and family violence), and results showed that receiving additional services did not improve the outcomes for parents. Thomas and Zimmer-Gembeck (2011) recently reported similar results where mothers who were at risk for maltreatment or had a history of maltreatment showed increased maternal sensitivity, improved parent–child interactions, and decreased stress after receiving PCIT when compared to the waitlist mothers. Furthermore, PCIT completers

were less likely to be notified to child welfare services than non-completers, suggesting an added benefit to completing the program.

Triple P-Positive Parenting Program is an example of a group-based parent education program that has shown to be effective in numerous control trials. Triple P follows a public health model offering services that range from universal applicability (e.g., information in the media about positive parenting) to more targeted parent training (Level 5 – Enhanced Triple P; Sanders, Turner, & Markie-Dadds, 2002). More recently, Sanders and colleagues (2004) have developed Pathways Triple P, which was designed specifically to reduce child maltreatment. In a strong randomized control trial, Prinz, Sanders, Shapiro, Whitaker, and Lutzker (2009) randomized 18 counties in one state to receive Triple P or not in order to examine population-level effects on child maltreatment. The control counties were comparable to treatment counties on county size, rate of poverty, and child abuse rates. Large effects were found on substantiated rates of child maltreatment, child out-of-home placements, and emergency room and hospital visits for child maltreatment-related injuries, with those counties receiving Triple P faring significantly better on all three outcomes. Another randomized control trial of Triple P was conducted in Australia by Sanders et al. (2004). Interestingly, they compared a version of enhanced Triple P that included attributional retraining and anger management to particularly target families at risk for child maltreatment to typical group Triple P. Although both conditions showed improvements in lower levels of parent-reported dysfunctional parenting, greater parental self-efficacy, and less parental distress and relationship conflict, parents that received the enhanced program showed lower levels of negative parental attributions for children's disruptive behavior. These studies demonstrate the utility and efficacy of Triple P as a child maltreatment prevention strategy.

Finally, the Incredible Years (IY) is a widely used, group-based parent training program that uses video vignettes of appropriate parenting and discussions to help parents build on their strengths and develop effective parenting



techniques (Webster-Stratton & Reid, 2010). This program has been tested in numerous studies and has shown to be effective. In particular, research consistently shows improvements in positive parenting and reductions in coercive parent-child interactions (e.g., Webster-Stratton, 1998). Recently, this program has been adapted to be used with parents at risk for maltreatment (Webster-Stratton & Reid, 2010). Linares, Montalto, Li, and Oza (2006) used IY with biological and foster parent pairs, of children who were mostly neglected, in a randomized control trial. Biological (as well as foster) parents showed significant gains in positive parenting after the completion of the 12-week program, and these findings remained at a 1-year follow-up. In families being monitored by CPS for child neglect in Canada, Letarte, Normandeau, and Allard (2010) found that those who received IY showed improvements in parenting behavior (e.g., decrease in harsh discipline and physical punishment) and parent evaluations of the child's behavior when compared to waitlist CPS-monitored parents. A third nonrandomized study with court-mandated child welfare families looked at the parenting stress levels after receiving IY, which showed significant decreases from pre- to posttest (Webster-Stratton & Reid, 2010). However, none of these studies looked at the effect of IY on child welfare outcomes or on rates of maltreatment cases, so conclusions cannot be drawn about whether improving parenting practices leads to improved child welfare outcomes.

The research discussed here shows the advancements in child abuse prevention programs over the last two decades. Although research shows the promise of these programs, it is still critical that the programs are implemented as intended. Programs that do not address the barriers to participation and program fidelity tend to show mostly nonsignificant results. Furthermore, programs that have not been studied well are still being used in many cases. Although these programs show positive effects on parenting behaviors and competencies, clearer connections to child welfare outcomes need to be made and tracked over time.

## What Is Promising

At the broadest level, child maltreatment takes place in the context of a violent, individualistic society that devalues children. Social problems such as poverty, oppression, and inequality cause a great deal of human suffering and are related to child maltreatment. Moreover, parenting is a role for which little preparation or support is provided (Febbraro, 1994). The role of caregiver is devalued, unsupported, and unrecognized (Febbraro).

Freisthler (2004) used spatial regression to explore neighborhood-level characteristics that affect the rates of child maltreatment. Not surprisingly, results show that higher rates of poverty and a higher density of bars, among other factors, predict a higher level of maltreatment. This study points to the idea that addressing neighborhood- or community-level factors could lead to a decrease in cases of child maltreatment by affecting some of the risk factors associated with the occurrence of maltreatment. Despite substantial evidence that community-level factors affect child abuse and neglect, examples of community-based child abuse prevention programs are few and far between. One notable exception is the Prinz et al. (2009) study that implemented the Triple P program at the community level in order to see if community-level rates of maltreatment could be reduced through widespread parent intervention. Alternatively, a goal of many parent education and support programs is to enhance social support and to connect families to needed resources, based on the idea that maltreating families tend to be isolated within their social networks or communities (Gomby et al., 1999). However, these aspects of parent-focused programs tend to be underemphasized (Febbraro, 1994).

Daro and Dodge (2009) make a similar argument for an integrated neighborhood approach to preventing maltreatment. The authors discuss the fact that neighborhoods have an influence not only on child development but on parenting behavior, and the good intentions of parents can be overridden by neighborhoods that do not support their health and mental health. Changing the values, customs, and services available to the

entire community would therefore change the context in which adults are parenting. For example, greater emphasis on the well-being of the neighborhood as a whole, rather than individuals within the neighborhood, would decrease the focus being put on any one family and increase the degree to which parents feel responsible for the neighborhood environment. Parents then feel more obligated to properly support their children, and neighborhoods would be more supportive of parents in their efforts. Although this approach is beginning to be implemented to a certain degree by programs such as Triple P, it is rarely used as it is hard to implement because it requires buy-in from the entire community.

Recent efforts have instead begun to focus on reaching parents within settings from which they are already receiving services in order to provide a more integrated service system. In particular, parents are being targeted within primary care settings. Utilizing doctors and nurses as the point of access is likely more effective because they are seen as authority figures that parents tend to trust. Furthermore, health-care workers are in a unique position in that they have access to almost all families at critical time periods.

Shaken baby syndrome (SBS), or abusive head trauma, is one form of child abuse for which universal prevention strategies in health-care settings have been shown to decrease the number of SBS cases and increase parental knowledge around triggers (e.g., inconsolable crying) for shaking infants. Shaken baby syndrome occurs when parents vigorously shake their infant, typically due to an inability to regulate one's anger and frustration around the needs of the infant (Walls, 2006). SBS can result in brain bleeding and severe cognitive defects and often results in the death of the infant. However, SBS is a widely preventable form of abuse. Research shows that educational interventions, particularly videos, that provide information to parents about the causes and effects of SBS are an effective mechanism in preventing SBS. Regardless of their risk factors, information can be provided to all parents in general health-care settings, such as the hospital after birth and in pediatric visits (e.g., Barr et al., 2009; Russell,

Trudeau, & Britner, 2008; Walls, 2006). Indeed, many states have begun to implement mandatory information sessions for parents before they can be discharged from the hospital.

Because health-care providers are usually some of the first professionals parents have interactions with, they also provide a good opportunity for screenings of risk factors associated with child maltreatment, such as a parental history of abuse, substance use, and maternal depression. For example, Dubowitz, Feigelman, Lane, and Kim (2009) conducted a randomized control trial of the Safe Environment for Every Kid (SEEK) model in Baltimore. This model trained residents at community clinics to screen for risk factors associated with maltreatment, had parents of children 0–5 complete a measure that further supported this screening, and provided an on-site social worker to meet with families and make referrals where necessary. When compared to clinics that received treatment as usual, the SEEK clinics had lower rates of reported maltreatment cases, less reports in medical documents that suggested abuse, and lower scores on a measure of harsh parenting. This study provides an example of how small changes to the typical health-care approach may be an effective approach to child maltreatment.

At a more programmatic level, Child First is a newer program that was designed to be a comprehensive, home-based program to be utilized within a coordinated system of care (Lowell, Carter, Godoy, Paulicin, & Briggs-Gowan, 2011). They target families facing multiple risks by coordinating services, including health-care services, to address these risks and providing relationship skills training in order to reduce ineffective parenting and child abuse and neglect (Lowell et al., 2011). In the first randomized control trial of Child First, parents who participated in the program showed less parenting stress at 6-month follow-up and less child welfare involvement after 3 years (Lowell et al.). Although more research studies are needed, initial results suggest that this coordinated, comprehensive model may be an effective way of addressing families facing multiple risk factors who are at higher risk of maltreatment.

The development of programs and policies that seek to prevent maltreatment at the societal level has just begun. Although it is important to address the individual-level factors that leave particular families at greater risk for maltreatment, it is also important to acknowledge that these families are embedded within the larger community (Daro & Dodge, 2009). Community is also important in the idea of accessing parents where they are already receiving services in the community. By becoming part of the community environment, child maltreatment prevention services may become more integrated into the community as a whole rather than isolating particular families to receive services. As research continues, it will be important to combine the individual-level and community-level efforts to bring about change for the community and our society as a whole.

### What Does Not Work

There are approaches currently in use that do not seem to be effective. A prevention technique sometimes used with children as young as three or four involves teaching children to protect themselves from an abuser. There has been no evidence that these programs lead to a decline in victimization. Moreover, they promote the message that children are capable of protecting themselves from an abuser (Miller-Perrin & Perrin, 1999).

Even for programs that incorporate aspects of promising or model programs, evaluation results tend to be less positive when the program is implemented poorly (Guterman, 1997). Unsuccessful programs also tend to be lacking in intensity, are short term, or are not comprehensive enough to achieve results (Guterman).

### Summary

Taken as a whole, prevention efforts to address child maltreatment are improving. Child abuse provides a good example of where prevention efforts are truly required in order to minimize and eliminate the negative effects experienced by children who are maltreated and to improve

the family environment in general. New conversations and efforts are arising to begin to address child maltreatment as a community initiative, recognizing that parents are embedded within communities that support or deter their efforts in the parenting role. Over the past decade, a growing number of evidence-based programs, utilizing rigorous evaluation techniques, have demonstrated that parenting programs can reduce child maltreatment rates. Future research needs to expand such efforts and, in particular, work to engage the most difficult-to-reach populations and families.

### Cross-References

- ▶ [Abuse and Neglect of Older Adults: Social and Economic Issues](#)
- ▶ [Abuse During Childhood](#)
- ▶ [Parenting as Primary Prevention](#)
- ▶ [Resiliency During Childhood](#)
- ▶ [Violence Prevention During Early Childhood](#)

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## Abuse During Childhood

Preston A. Britner<sup>1</sup>, Jodie K. Comer<sup>1</sup> and Sharon G. Portwood<sup>2</sup>

<sup>1</sup>Department of Human Development & Family Studies, University of Connecticut, Storrs, CT, USA

<sup>2</sup>Department of Public Health Sciences, The University of North Carolina at Charlotte, Charlotte, NC, USA

### Introduction

Child maltreatment is a serious and widespread problem with well-documented negative consequences for children (e.g., Gilbert et al., 2009). Given the impact child maltreatment often has on the child, as well as the family, community, and society as a whole, it is crucial to focus research and programmatic efforts on effective methods of preventing child maltreatment. Abuse prevention strategies aimed specifically at children aged 5 through 12 years are less common than those targeting parents of children under the age of 5 (see “► Abuse During Early Childhood” entry in this volume). Nonetheless, there is a growing body of research on correlates of abuse during childhood and on promising prevention programs designed to reduce rates of maltreatment. Many of these prevention efforts are embedded within parenting interventions that are also designed to promote a variety of positive family interactions and outcomes. Other (often school-based) models are targeted to the child, and the literature on their effectiveness is less promising.

### Definitions and Scope

Child maltreatment has been defined both in terms of acts of commission (i.e., abuse) and acts of omission (i.e., neglect). According to the Child Abuse Prevention and Treatment Act (CAPTA) of 1974, child maltreatment is defined

as “any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation; or an act or failure to act which presents an imminent risk of serious harm.” This definition is general in scope, and several subcategories of child maltreatment are more specifically defined. Despite federal definitions and policies, child maltreatment is addressed on the state level resulting in each state deriving their own definition of what specifically constitutes child maltreatment and the different subcategories. Further, each state establishes through statute their own requirements in terms of the level of evidence needed to make a finding or substantiation of abuse or neglect (Portwood, 1999). Consequently, there is wide variation in terms of the specific behaviors that constitute child maltreatment.

The variation in definitions of child maltreatment throughout the United States often creates problems both in terms of research and practice. For example, it can be difficult to determine when maltreatment has occurred. Additionally, it creates complexity in defining the effectiveness of any child maltreatment prevention strategies. However, despite these definitional dilemmas, four subcategories of child maltreatment are generally recognized by states: physical abuse, psychological or emotional abuse, sexual abuse, and neglect. Physical abuse has been defined as the infliction of non-accidental physical injury. Psychological or emotional abuse has been defined as the infliction of non-accidental emotional harm or injury. Sexual abuse consists of any sexual activity with a child where consent is not or cannot be given (Finkelhor, 1979). Neglect is characterized by negligent acts or omissions that harm or threaten harm to a child. Neglect may have several subcategories, including the following: *physical neglect*, which includes failure to provide for a child’s basic physical needs, including food, shelter, or clothing; *emotional neglect*, which consists of inattention to a child’s emotional needs; *medical neglect*, which refers to a caregiver’s failure to provide prescribed medical treatment; and *educational neglect*, which has been defined as a caregivers’ failure to comply



with legal requirements for the education of children (Erickson & Egeland, 1996).

Broad definitions of child maltreatment also encompass exposure to domestic and/or community violence and sibling abuse, topics beyond the scope of this entry.

Given the difficulty with defining child maltreatment and the subjective nature of many of the subcategory definitions, it is difficult to determine the specific magnitude of child maltreatment in the United States. Further, despite efforts to increase awareness and reporting of suspected child maltreatment, there are undoubtedly incidents of child maltreatment that are left unreported. Regardless, despite these difficulties, it is clear that the magnitude of child maltreatment is substantial. According to the US Department of Health and Human Services (U.S. DHHS, 2010), in 2009, there were just over three million reports of child maltreatment in the United States. Of those three million reports of child maltreatment, child protection agencies responded to just over two million reports, and just over 700,000 (22.1 %) of the reports resulted in a finding or substantiation of child maltreatment. Thus, 9.3 per 1,000 children were victims of child maltreatment in the United States in 2009 (U.S. DHHS, 2010). However, it is important to consider this statistic in light of the defining and reporting difficulties.

Children in the age group of birth to 1 year are at the highest risk for child maltreatment, with a victimization rate at 20.6 per 1,000 (U.S. DHHS, 2010). Most data suggest that the risk of physical abuse and neglect decreases with age. For example, statistics consistently indicate that almost half of children victimized through physical abuse are age seven or younger (Miller-Perrin & Perrin, 2012). However, this decreased risk is not evidenced in self-report data, suggesting that it may not be the actual occurrence of abuse, but rather the risk of injury that dissipates as children age. Recent efforts (e.g., Leventhal, Martin, & Gaither, 2012) to monitor US hospital data on the occurrence of serious injuries due to physical abuse represent another approach to understanding the scope of the problem, monitor trends over time, and evaluate the effects of prevention programs.

Additionally, contrary to other forms of maltreatment, the risk of sexual abuse appears to increase with age. Although the majority of all sexual abuse cases, at least within the United States, occur within the 5- to 12-year age range, the majority of substantiated cases involving this age group of children were neglect cases (U.S. DHHS, 2010). For all types of child maltreatment, an adult known to the child is most likely to be the perpetrator (Miller-Perrin & Perrin, 2012).

The costs of child maltreatment are substantial, including not only treatment for physical or emotional injuries sustained as an immediate result of the abuse but also extending to chronic health and socio-emotional difficulties. Research suggests that many problems emerge in childhood and continue well into adulthood, including drug or alcohol dependence and other deviant behaviors. Accordingly, the combined annual costs to special education, public health, rehabilitation, criminal justice, and child welfare systems have been estimated to be in the billions of dollars (Daro, 1988; Fang, Brown, Florence, & Mercy, 2012).

Although a direct cross-cultural comparison of the scope of the problem is not possible due to differences in compilation and reporting procedures, child maltreatment is not unique to the United States. Mikton and Butchart (2009), in a review of 298 child maltreatment outcome evaluation studies, found that 99.4 % of the studies were conducted in high-income countries (including 83 % in the United States). Thus, we know little about the effects of maltreatment prevention in low- and middle-income countries.

## Theories

Whereas child abuse can be viewed as an aggressive act and thus informed by traditional models of aggression, the special context in which most abuse occurs (i.e., the family) has focused most theories of child maltreatment on group and family processes. Overall, theories on the causes of child maltreatment have moved from a focus on the individual to an attempt to integrate multiple levels of analysis (Azar, Povilaitis, Lauretti, & Pouquette, 1998).

One popular group of theories views abuse as one end of a parenting continuum. These *developmentally based* models are essentially models of parenting adequacy and thus have substantial import for the development of effective prevention strategies. *Perpetrator models* that, in the extreme, propose that offenders are psychotic or suffer from other psychological disorders were popular early explanations of child maltreatment (Azar et al., 1998). However, recently researchers have begun to explore perpetrator theories based on biological approaches. Some of the more promising perpetrator theories focus on parental social–cognitive disturbances, positing that such parental factors as a disturbed schema involving children, problem-solving deficits, and lack of perspective-taking ability may lead to maladaptive parenting. Other theories have focused on child victims, attempting to identify characteristics of abused children that may produce violent behavior in a vulnerable parent.

At the macrolevel, researchers have sought to identify a variety of social and cultural factors that contribute to child maltreatment. Foremost among these is a general tolerance for violent acts within the culture that may “spillover” into the home; for example, excessive exposure to violence through the media can contribute to a general acceptance of violence within the family environment. One marker of cultural standards in regard to physical violence against children is corporal punishment, leading some to suggest that a general acceptance of spanking as an appropriate form of discipline contributes, at least indirectly, to child maltreatment and to physical child abuse in particular (Miller-Perrin & Perrin, 2012).

*Strain theories* have also developed around the notion that financial inequities within the societal structure place lower-income families, unemployed families, and families receiving governmental assistance, who experience high levels of stress and frustration, at higher risk of maltreatment.

More recent theories, rather than distinguishing among perpetrator, victim, and environmental factors, have proposed *multiple trajectories* to the development of abusive behavior that link these factors. One notable model is

that proposed by Belsky (1980), who suggested that the roots of maltreatment lie in multiple ecological systems, that is, what parents bring to parenthood, family factors, factors in the larger social setting, and cultural values and beliefs. A second model was outlined by Azar and Twentyman (1986), who identified five areas of parental skill deficit that contribute to an increased risk of abuse: “parenting skills (e.g., too narrow a repertoire), cognitive dysfunctions (e.g., unrealistic expectations regarding children), and impulse control, stress management, and social skills problems” (Azar et al., 1998, p. 9).

## Current Research

Research on child maltreatment is relatively recent, with essentially all research being conducted since 1970 and vast amounts of research being conducted in the last two decades. This research indicates that the origins and consequences of child maltreatment are complex. Research on the origins of child maltreatment and different risk and/or protective factors linked with maltreatment can generally be grouped into four categories: perpetrator characteristics, child characteristics, family characteristics, and the broader social context.

### Perpetrator Characteristics

Given the high percentage of parents as the perpetrators of child maltreatment, which has been reported as over 80 % (U.S. DHHS, 2010), it is logical that much of the research on perpetrator characteristics focuses on parents. Parental characteristics associated with child maltreatment include substance abuse, involvement in a domestically violent relationship, and lack of involvement in community activities (Brown, Cohen, Johnson, & Salzinger, 1998). Poverty and a previous history of child abuse are also associated with maltreating one’s child (Ondersma, 2002). Additionally, perpetrators of child maltreatment tend to have lower self-esteem, inappropriate expectations of their children, and less empathy with their children (Milner, 1998). In general, five domains of parental disturbance can be considered: cognitive



disturbances, deficits in parenting skill, problems with impulse control, difficulties with stress management, and social skill problems (Azar & Twentyman, 1986). Each of these deficits, alone or in combination, can play a role in more systemic difficulties that heighten the risk of abuse. For example, a parent's deficits in social skills may result in a smaller support network.

With regard specifically to sexual abuse, the perpetrator tends to be male, to have interpersonal problems, and to be antisocial (Milner, 1998). However, female perpetrators are more likely to sexually abuse younger children than are male perpetrators (Peter, 2009). Regardless, much of the research on characteristics of sexual abusers has focused primarily on males and may not necessarily be generalizable to female perpetrators. The majority of this research has also been generated from a psychiatric model, assuming that the root cause of sexual abuse lies in the individual psychopathology of male abusers. As noted, there is some evidence to suggest that sexual abusers exhibit some antisocial tendencies, including a disregard for others and lack of impulse control, and/or deficits in heterosocial skills (Miller-Perrin & Perrin, 2012). Other theories center on deviant sexual arousal, which prompts offenders to solicit sexual encounters with children. The as yet undetermined origins of this deviant sexual arousal are believed to be partially biological. However, this explanation does not appear adequate to explain incest. Instead, family dysfunction models posit that either the family or one of its adult members contributes to a context in which the sexual victimization of children is permitted or even encouraged.

### **Child Characteristics**

Child characteristics that have been associated with maltreatment include having a disability. There is a relatively large and consistent body of literature suggesting the correlation between children with disabilities and increased risk of maltreatment when compared to non-disabled children (Howe, 2006). Additional child characteristics associated with maltreatment include having a difficult temperament, psychiatric symptoms, or behavioral problems (Brown et al.,

1998). However, when examining the behavior of both parents and children, the question of directionality arises, that is, to what degree and in what ways negative parenting behavior contribute to behavior from the child, and vice versa.

### **Family Characteristics**

Family characteristics are also related to the rate of child maltreatment. Situations that contribute to the level of stress within a family, including illness, death of a family member, and larger than average family size, have been established as risk factors for physical abuse (Miller-Perrin & Perrin, 2012). Other family factors associated with child maltreatment include high levels of conflict, the occurrence of partner violence, social isolation, high levels of stress, poverty, and a lack of support (Milner, 1998).

With regard to additional family characteristics, poor parent-child relationships and marital conflict have been associated specifically with sexual abuse (Finkelhor, 1984). At the macrolevel, social and community factors, particularly social attitudes toward women and child pornography, appear to contribute to sexual abuse. Family environments in which incest occurs are particularly likely to be characterized by substantial power differentials between male and female members (Miller-Perrin & Perrin, 2012). Unlike other forms of maltreatment, sexual abuse is not generally related to SES (Milner, 1998).

### **Social Context Factors**

Social context factors have also demonstrated an association with child maltreatment. Child maltreatment rates are higher in communities with certain socioeconomic characteristics (Garbarino, Kostelny, & Grady, 1993). Communities where a larger proportion of residents live in poverty tend to have higher rates of maltreatment. Communities with more female-headed households, a higher unemployment rate, a lower percentage of wealthy residents, a lower median education level, more overcrowding, and a higher percentage of new residents tend to have higher rates of maltreatment as well (Garbarino et al., 1993). However, it is important to note that child maltreatment is by no means typical of all

families that struggle financially, suggesting that other factors are at work. Notable among these is social bonding/social isolation. Abusive parents have been found to have relatively fewer contacts with peer networks, immediate family, and other relatives (Miller-Perrin & Perrin, 2012). Moreover, Emery and Laumann-Billings (1998) found that even in low-income neighborhoods, child maltreatment rates tend to be low when residents know one another, there is a sense of community pride, people are involved in community organizations, and residents feel that they can ask their neighbors for help.

## Overview of Strategies

Parenting programs that seek to reduce child maltreatment and simultaneously promote a host of positive child outcomes are consistent with recent priorities with the offices for violence prevention at the Centers for Disease Control and Prevention (CDC) and the American Psychological Association (APA) and a focus on promoting safe, stable, nurturing relationships for children through positive parenting (American Psychological Association [APA], 2009). Most of the 46 randomized trials of preventive parenting programs reviewed by Sandler, Schoenfelder, Wolchik, and MacKinnon (2011) demonstrated short-term and long-term effects on a variety of child outcomes (not focused on child maltreatment). What was less clear was the mechanism of change. Sandler et al. propose three alternative pathways to positive child effects, through program effects on parenting, through program-induced reductions in children's stressors and improvements in adaptations to stress, and through effects on contexts in which children reside and engage. Many of the strategies in the literature on child abuse prevention share these ideas about pathways, although specific tests of these mechanisms are limited.

## What Works

With the recent expansion of the literature on child maltreatment, a few approaches have

emerged as successful in preventing the occurrence of maltreatment in children aged five to twelve. Specifically, some parent education programs, home visitation programs, and systemic prevention approaches have proven effective in the prevention of child maltreatment. Although typically implemented with parents of infants and toddlers, some programs also serve parents of older children. Further, some of the programs that target parents of younger children address successful strategies to reduce risk factors and enhance protective factors in parents, which may accrue positive effects that continue beyond the earliest stages of childhood throughout the duration of childhood (Mikton & Butchart, 2009).

## Parent Education Programs

Parent education is one of the most commonly used prevention methods relative to child maltreatment (APA, 2009; Barth et al., 2005). Parent education programs aim to prevent child maltreatment by equipping parents with knowledge and skills to increase protective factors, thus reducing child maltreatment. However, parent education programs are often focused on preventing, reducing, and treating children with serious behavior problems, who only represent a portion of the entire child welfare population (Barth et al.), and some of the research on the effectiveness of parent education programs presents mixed findings (Maher, Marcynyszyn, Corwin & Hodnett, 2011). There are a number of studies on the effects of locally developed parent education programs on child maltreatment outcomes for targeted populations, such as first-time teen parents (e.g., Britner & Reppucci, 1997). However, only a few parent education programs have demonstrated their effectiveness with rigorous evaluation designs; these include Parent-Child Interaction Therapy (Eyberg & Robinson, 1982), the Nurturing Parenting Program (Maher et al., 2011), and the Incredible Years (Webster-Stratton, 2007).

Parent-Child Interaction Therapy (PCIT) aims to modify parent-child interactions to support child development and positive outcomes through coaching and direct work with the parents as they interact with their child. Participants in PCIT have been found to have increased

positive parenting interactions and decreased occurrences of re-reports of child maltreatment relative to a community-based parenting group, in a randomized trial of 110 physically abusive parents (Chaffin et al., 2004). Similarly, the Nurturing Parenting Program has demonstrated increased positive parenting among participants, especially when there was adequate program participation. Utilizing a statewide administrative child welfare database, researchers found that longer-term reductions in substantiated child maltreatment incidences (in childhood) increased as program participation by parents (when their children were infants, toddlers, and preschoolers) increased (Maher et al., 2011). The Incredible Years (IY) program is a third example of a parenting education program that has demonstrated increased positive parenting among participants through a number of rigorous studies (Webster-Stratton, 2007); however, it has not specifically been linked with any child welfare outcomes. Despite some mixed findings in the literature, it seems clear that some well-developed parent education programs are responsible for positive parenting outcomes among participants (APA, 2009).

### Home Visitation Programs

Home visitation programs entail providing support, parent education, crisis intervention, and related services to parents with the goal of promoting healthy pregnancies, healthy infants and families, and the prevention of child maltreatment (Russell, Britner, & Woolard, 2007). Initial evaluations reported mixed findings in terms of the effectiveness of home visitation programs; however, more recently support has emerged highlighting the effectiveness of certain home visitation programs in reducing future occurrences of child maltreatment. For example, the SafeCare program and the Nurse–Family Partnership program have both demonstrated documented success with factors associated with the prevention of child maltreatment.

The SafeCare program is a home-based program that targets imminent maltreatment behaviors and utilizes a skills-based approach to changing parenting behaviors. The SafeCare program has received substantial attention in the

literature (e.g., Gershater-Molko, Lutzker, & Wesch, 2003), most of which supports the notion that the program produces changes in behavioral domains directly proximal to child maltreatment (Silovsky et al., 2011). Of note, Silovsky and colleagues' (2011) randomized clinical trial of an augmented version of SafeCare is a rare example of a program tailored to – and studied with – a high-risk rural population.

The Nurse–Family Partnership program has received significant attention in the literature, as the program has been around for over 30 years. Relying on the expertise of nurses, at-risk first-time mothers receive individual intensive attention focused on parenting skills. The program has been linked with positive outcomes for mothers and children as well as a reduction in child maltreatment (Olds et al., 1997).

It is clear that both the parenting education programs and the home visitation programs are *at least* associated with producing changes that are proximal to child maltreatment, if not directly associated with prevention of child maltreatment. A universal approach to such programs may be an appropriate strategy. Additionally, implications of utilizing new technology to assist in prevention programs indicate possibilities for reducing the costs of such prevention efforts (e.g., Jabaley, Lutzker, Whitaker, & Self-Brown, 2011).

### A Systemic, Public Health Approach

The Triple P-Positive Parenting Program follows a public health model offering services that range from universal applicability (e.g., information in the media about positive parenting) to more targeted training for parents of children from birth to adolescence. Although the specifics vary by target group, the general goals are for children to develop emotional self-regulation and for parents to become competent problem-solvers. Studies to date have been supportive of the population-based model (e.g., Shapiro, Prinz, & Sanders, 2010). Prinz, Sanders, Shapiro, Whitaker, and Lutzker (2009) randomized 18 counties in one US state to receive Triple P or not in order to examine population-level effects on child maltreatment. The control counties were comparable to treatment counties

on county size, rate of poverty, and child abuse rates. Large effects were found on substantiated rates of child maltreatment, child out-of-home placements, and emergency room and hospital visits for child maltreatment-related injuries, with those counties receiving Triple P faring significantly better on all three outcomes.

### **What Is Promising**

Public awareness campaigns, media presentation, and speaker programs to voluntary organizations and civic groups may serve to increase public awareness of the problems associated with child maltreatment. Similarly, involvement of religious institutions may assist in preventing child maltreatment. Mandated reporting laws may have impacted child maltreatment, particularly in the 5- to 12-year-old age group, as parents are aware that school professionals are mandated to report any suspicion of abuse or neglect. More systematic and rigorous evaluation is needed in order to test these possibilities.

### **What Does Not Work**

There are a few child maltreatment prevention strategies that have no evidence of being effective. First, strategies focused on teaching children to protect themselves from abuse have not proven to decrease victimization (Miller-Perrin & Perrin, 2012). In the 1980s, programs aimed at teaching children to recognize, resist, and report abuse became popular for school-aged children. Such programs emphasize two goals: primary prevention of child maltreatment and detection of child maltreatment. Programs vary regarding the amount of time spent on lessons and on the details of the program content, utilizing films, skits, lectures, coloring books, songs, and/or puppet shows to convey lessons about sexual abuse, assertiveness, avoidance, and disclosure. However, these programs share the same core assumptions, specifically the following: (1) many children do not know what sexual abuse is; (2) children do not need to tolerate sexual

touching; (3) adults want to know about children who experience sexual touching by adults; and (4) disclosure of sexual touching will help to stop it (National Research Council, 1993).

Limited data suggest that child participants in such programs demonstrate increased knowledge immediately following the program; however, these gains in knowledge tend to deteriorate over time (Finkelhor & Strapko, 1992). More importantly, there is no evidence of a reduction in the actual number of victimizations as a result of participation in these school-based programs, and there is nothing to suggest that they help children resist abuse (Miller-Perrin & Perrin, 2012). Additionally, numerous concerns have emerged regarding the effect of such programs on children, including instilling feelings of fear, vulnerability, and anxiety in children (Adler & McCain, 1994) and sending the message to children that they are in some way responsible for preventing their own abuse (Melton, 1992).

Second, criminal sanctions for child maltreatment are often thought to have a deterrent effect. However, there is no evidence that current laws have any such deterrent effect. Moreover, there is some suggestion that legal procedures and sanctions that lead to children's removal from their parents may be counterproductive, especially in cases involving parental offenders and mild to moderate forms of maltreatment. Finally, any program or strategy regardless of the strength of the substance will be ineffective if not implemented properly. Many programs have promising goals and structure, yet when implemented are not comprehensive enough to achieve significant results (Guterman, 1997).

### **Summary**

It is clear that child maltreatment is a prominent and pervasive concern, and given the potential consequences of child maltreatment, future research efforts require a focus on prevention. Although relatively limited in terms of empirical support, prevention strategies for child maltreatment are becoming more widely recognized, accepted, and implemented. However, the

majority of child welfare resources continue to be allocated to intervention efforts *after* child maltreatment has occurred. In the last two decades, great strides have been made relative to the identification of risk and protective factors associated with abuse, as well as the promotion of other aspects of general health and well-being. Further program development and evaluation is needed to understand more about what works, for whom (i.e., across more varied populations) and how model programs may be brought up to scale with fidelity *and* appropriate fit to client needs and community systems.

## See Also

- ▶ [Abuse and Neglect of Older Adults: Social and Economic Issues](#)
- ▶ [Abuse During Early Childhood](#)
- ▶ [Parenting as Primary Prevention](#)
- ▶ [Resiliency During Childhood](#)
- ▶ [Violence Prevention During Early Childhood](#)

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## Aggressive Behavior Prevention During Childhood

Douglas Smith, Andrew Stuck and  
Brayton Tompkins  
Department of Psychology, Southern Oregon  
University, Ashland, OR, USA

### Introduction

Although serious acts of aggression including assaults, robberies, and even homicides involving children as perpetrators can and do occur, these are, by and large, extremely rare events (DeVoe & Bauer, 2010). Of much greater concern to teachers, parents, and others who interact with children on a regular basis are relatively low level acts of aggression such as teasing, arguing, minor physical, and verbal altercations and other forms of interpersonal conflict that are often viewed as part of normal childhood development. Research suggests that these types of minor aggressive acts occur frequently among children and if left undeterred may evolve into more serious types of aggression in later childhood and adolescence (Dodge Greenberg, Malone, & Conduct Problems Research Group, 2008; Dymnicki, Weissberg, & Henry, 2012).

The purpose of this entry is to review the status and evolution of aggressive behavior in children with an eye toward identifying both the key developmental factors in its emergence and the most successful options for preventing or reducing its occurrence and impact. We will begin with a more detailed discussion of what constitutes aggressive behavior in childhood and its prevalence as a function of certain key moderating variables including family, school, and peer influences.

### Definitions and Scope

Although children's aggression can take many forms, it typically includes relatively low-impact

transgressions such as teasing, name-calling, rumoring, and physical offenses including pushing, kicking, hitting, and biting. Evidence from a number of recent national surveys including the California Healthy Kids Survey (California Department of Education, 2010) and the Indicators of School Crime and Safety (Dinkes, Kemp, & Baum, 2009) suggests that these types of behaviors are quite common among children in preschool through elementary school years.

One particularly widespread form of aggressive behavior among elementary-age children is bullying. This occurs most frequently in school settings and is differentiated from other acts of peer aggression by an imbalance in power between the aggressor and the victim and by the fact that it tends to occur repeatedly over time. Current research suggests that between 15 % and 30 % of students report being victimized by bullies at school and almost 10 % are subjected to bullying on a regular basis (Davidson & Demaray, 2007; Nansel et al., 2001). More recently, there is widespread concern about bullying that is perpetuated via the Internet or mobile devices. "Cyberbullying" or "cyber-aggression" poses an additional threat to children and youth, particularly in more developed regions of the world (Smith, 2012). Research indicates that bullying and being bullied, whether through traditional or "cyber" modes, are associated with poorer social and emotional adjustment throughout the lifespan (Frey, Newman, Nolen, & Hirschstein, 2012).

There is also considerable evidence for the stability of aggressive behavior over time. Young children who engage in frequent acts of aggression often grow up to be aggressive adults, engaging in more serious acts of violence such as domestic abuse, assault, armed robbery, and other crimes against persons (Farrington, 1994; Haapasalo & Tremblay, 1994). Furthermore, stability of aggressive behavior occurs not only within individuals but across generations as well (Loeber & Stouthamer-Loeber, 1998).

Until fairly recently, aggressive behavior among children was primarily considered as a problem among boys. It is true that boys tend to engage in direct forms of aggression such as fighting and physical intimidation more

frequently than girls, but we now know that girls also aggress against peers, albeit in less direct ways. Nicky Crick, at the University of Minnesota, has used the term “relational aggression” to describe indirect aggression designed to harm social relationships through exclusion, gossip, and spreading of negative rumors. Studies suggest that up to 20 % of elementary school females report engaging in or being victimized by relational aggression (Crick & Bigbee, 1998).

Since relational aggression as a form of victimization is more covert than physical aggression, it often goes undetected by teachers and other adults. By increasing our awareness of the range of both direct and indirect behaviors that constitute aggressive victimization, we are in a better position to identify the perpetrators early and establish suitable prevention and intervention strategies.

## Theories

Aggressive behavior in children is the manifestation of a dynamic developmental interplay of individual dispositions and social and cultural factors within the contexts of schools, families, and communities. No single theory can account for the multiplicity of factors that contribute to childhood aggression or reduce the likelihood of its occurrence across multiple settings. In this section we will briefly discuss several theoretical models related to childhood aggression. These include *social learning theory*, *information-processing*, and *social-ecological* models.

### Social Learning Theory

The social learning theory approach to understanding aggressive behavior places primary emphasis on the reciprocal nature of parent-child and child-child interactions in the development of aggressive behavior. It is within the context of everyday social exchanges between family members and later within peer groups that verbal and physical patterns of aggression are learned.

Various researchers such as Gerald Patterson and colleagues at the Oregon Social Learning

Center (Granic & Patterson, 2006; Patterson & Yoerger, 2002) and Donald Meichenbaum at the Melissa Institute (Meichenbaum, 2009) have described the developmental trajectory and potential mechanisms through which aggressive behavior is learned in young children. Such learning can occur in the context of families through parental modeling of overly harsh, coercive, and inconsistent discipline tactics including use of physical punishment. Patterson and colleagues refer to a “coercive family process,” in which the child’s initial and subsequent noncompliance with parental demands may be met by more and more “extreme” measures to achieve compliance. As the child’s resistance to such measures increases, there is a tendency on the part of parents to use even more coercive, aggressive strategies in an effort to gain compliance or, alternatively, to give in to the child’s noncompliance. In either case, the child perceives aggression as an effective tactic for controlling others and reducing aversive events. At the same time, there is less opportunity for learning and practicing more prosocial and adaptive problem-solving skills. A major implication of the social learning theory perspective on aggression is that, once established, aggressive behavior is likely to increase in both frequency and intensity over time as a function of the positive outcomes associated with its use.

The social learning perspective also highlights the critical role of peers in the instigation and proliferation of aggressive behavior. Favorable peer reactions are powerful reinforcers of aggressive behavior in childhood, and some children learn to orchestrate aggressive opportunities in the interest of maximizing their status within the peer group. In the case of bullying, for example, bullies may achieve power and control in the eyes of some peers by dominating weaker victims.

### Information-Processing Model

The information-processing model is characterized by the work of Dodge and colleagues (Crozier et al., 2008; Dodge et al., 2008) who have studied the social-cognitive processes typical of aggressive children. Aggressive behavior is viewed as resulting from systematic biases



in the understanding and processing of social cues and behaviors. Aggressive youth are often described as having a “hostile attributional bias,” whereby they interpret the behavior of others as intentionally vengeful. Based upon this perception, aggression is justified as an appropriate response.

In addition to cognitive biases, several other social-cognitive limitations may be present among aggressive children. For example, research indicates that aggressive children are frequently insensitive to the emotional needs and reactions of others and are also limited in their ability to solve interpersonal conflicts in ways that demonstrate an understanding of others’ perspectives. These types of social-cognitive deficiencies make it more likely that aggressive actions will be employed, particularly in social conflict situations.

### **Social-Ecological Model**

The social-ecological model of children’s aggression places primary emphasis on the environments within which the child operates. In addition to family and peer influences as discussed previously, the broader environment includes the contexts of school and community. For example, school factors, such as classroom climate, play a vital role in the extent and degree of aggression expressed by young children (Wilson, 2004). Aggressive children thrive in school environments characterized by high student-teacher ratios, inadequate supervision, and lack of a school-wide policy that not only prohibits aggression but also consistently encourages and reinforces prosocial behaviors. Teachers and other school personnel can also play an important enabling role if they fail to respond to early incidents of aggression such as teasing, pushing, shoving, and other relatively innocuous forms of antisocial behavior. Tacit approval of such by adults signals that prosocial behavior is not the expected norm within the classroom.

Community factors that support and enable aggressive patterns of behavior include the ecology of the child’s neighborhood and overall degree of neighborhood safety. Students who reside in unsafe neighborhoods are more likely

to witness acts of violence by others, perhaps desensitizing them to the overall impact of violence. One study (Espelage, Bosworth, & Simon, 2000) found that students who perceived their neighborhood as less safe were significantly more likely to bully their peers than students from safer neighborhoods.

### **Current Research**

Current conceptualizations of aggressive behavior in children recognize that multiple factors operate in a cumulative and reciprocal fashion to promote aggression. These include individual dispositions and temperamental factors, family and peer influences, and factors within the broader ecology including schools and communities. A growing body of research supports a multidimensional developmental framework whereby children acquire and express aggressive behaviors as a product of social learning, information-processing deficits, and the specific environments in which they exist.

Meichenbaum’s (2009) model, for example, posits that early-onset aggressive behavior can be frequently linked to high-risk genetic as well as early environmental influences, which may promote and reinforce antisocial behavior in young children. Such vulnerabilities often include parental rejection and neglect, childhood victimization, and social and cultural norms that directly or indirectly support aggression as a means of resolving conflict. Subsequent patterns of aggression in school often result in peer rejection, discipline problems, lack of school connectedness, and increased risk for academic difficulties and school dropout.

Given the complexity and multiple pathways through which aggressive behavior develops throughout childhood, it is important that prevention and intervention efforts are comprehensive and target multiple risk and protective factors. Effective treatments must be delivered early; should target multiple contexts including home, school, and community; should be evidence based; and require substantial collaborative efforts in terms of service delivery systems.

## Overview of Intervention Strategies

Aggression is a highly stable behavioral trait, so it is important that prevention and intervention programs be developed early before these patterns are established. Most intervention programs are school and/or home based and involve both targeted and universal components. Targeted programs are often skill based and target children who are already demonstrating a propensity toward aggressive behavior or have characteristics that might place them at risk for such outcomes. Universal programs take place within the school context, are preventive, and provide opportunities for all students to acquire a repertoire of prosocial skills as an alternative to aggression. What works best are prevention programs that target early signs of aggressive behavior and programs that promote prosocial norms and behaviors across multiple settings. The effective programs described in the following section have in common the fact that they include skill-based instruction in social and emotional competencies, nonaggressive alternatives to conflict resolution, and other relevant social-cognitive skills delivered in school, home, and community settings and targeting not only children but teachers and families as well.

### What Works

In terms of what works to prevent aggression in childhood, it is clear that effective programs are comprehensive in scope and target individual, family, school, and community factors. In addition, these efforts are delivered early in the developmental trajectory and include such components as social-cognitive skills training, anger management, parent education, and efforts to promote academic success and engagement in school and the community. In this section we briefly target four exemplary approaches that have received a substantial amount of empirical support.

### Promoting Alternative Thinking Strategies (PATHS)

PATHS is a universal prevention/intervention program focused on developing social and emotional skills in children using a systematic,

developmentally based, multiyear curriculum. The program includes both preK/K (Domitrovich, Greenberg, Kusche, & Cortes, 2004) and elementary grade-level (Greenberg, Kusche, & Conduct Problems Prevention Research Group, 2011) curriculums that target domains such as self-control, relationships with others, interpersonal problem-solving strategies, self-esteem, and emotional understanding. As a primary prevention effort, PATHS is designed to be taught within a regular education classroom and includes activities to intentionally promote transfer and generalization of learned skills to the broader environment. The program focuses on building protective factors such as reflective thinking, accurate evaluation of social situations, frustration tolerance, management of difficult emotions such as anger and disappointment, and group cohesion and bonding, especially within the classroom context. Family participation is also encouraged through letters and information to parents and use of homework assignments.

The research in support of PATHS as a deterrent to aggression in young children is substantial. In a longitudinal 3-year controlled study involving 2,937 early elementary students (Conduct Problems Prevention Research Group, 2010), the PATHS curriculum was implemented at schools varying widely in socioeconomic status. According to teacher ratings at the various sites, there were decreases in conduct and behavior problems as well as increases in concentration, attention, and amount of work completed in classrooms that utilized the PATHS curriculum. There were also increases in examples of prosocial behavior and the regulation of emotional arousal. According to peer ratings, there was a decrease in the degree of aggression displayed by students in the PATHS classrooms. The program had the most impact on children with mild or minor behavioral issues rather than those who exhibited extreme forms of aggression.

A number of other controlled studies with elementary students in regular and special education settings have supported the value of PATHS for improving emotional regulation and management and the ability to resolve interpersonal

conflicts in a more socially appropriate fashion (see, e.g., Greenberg, Kusche, Cook, & Quamma (1995) and Riggs, Greenberg, Kusche, & Pentz (2006)). In addition, studies completed in the Netherlands, Germany, and England demonstrated significant reductions in aggression after children and their families received PATHS training for 1 year (Kusche & Greenberg, 2012).

### Second Step

*Second Step* is a commercially available, school-based violence prevention program that focuses on building social and emotional competencies in children from preschool through middle school (Committee for Children, 2002, 2008). As a universal or primary prevention curriculum, it aims to reduce aggressive behavior by teaching children prosocial thoughts and behaviors that lead to positive relationships with others. The curriculum is built upon evidence-based strategies that enhance social skills and thereby reduce aggression. *Second Step* has been widely used in schools in the United States and Canada and also translated for use in various countries throughout the world.

The *Second Step* program focuses on three major areas of social competence including empathy, social problem-solving, and emotional management. These skills are acquired through a variety of modalities such as discussions, role-playing, modeling, and coaching. The curricula consist of lessons delivered in scripted form for teachers and accompanied by video and other support materials. The program also includes a family component and homework activities in an effort to involve family members in the learning and use of social-cognitive skills.

The research supporting this program is substantial and enhances the notion of a universal social-emotional approach to prevention of aggressive behavior. Controlled studies have been conducted across a variety of age, racial, and socioeconomic groups in both urban and rural settings. In general, the *Second Step* curriculum has been found to result in increased prosocial knowledge and attitudes, as well as more positive social behavior.

One evaluative study by Frey, Nolen, Edstrom, and Hirschstein (2005) with second-

through fifth-grade students in several schools in the United States found that students participating in the *Second Step* program were rated as more socially competent and less antisocial by their teachers after 1 year in the program. The greatest gains were made by students who were initially rated as more antisocial by their teachers, thereby supporting *Second Step's* effectiveness as both a universal and a targeted prevention strategy for children already manifesting aggressive behavior concerns.

A randomized control group study by Grossman et al. (1997) with almost 800 second- and third-grade students demonstrated significant reductions in physical aggression for *Second Step* participants compared to controls, as well as increases in positive social behaviors. These findings were based on behavioral observations by coders blind to treatment conditions, although parent and teacher ratings of behavior did not reflect these differences.

In Germany, a randomized control group study of elementary-age children by Schick and Cierpka (2005) found significant declines in depressed, anxious, and socially withdrawn behavior among children introduced to *Second Step* for only one semester period. Parent ratings indicated more substantial effects for girls than for boys within the program.

A number of other studies conducted with children from kindergarten through middle school who participated in the *Second Step* intervention suggest that the program has a significant impact on reduction of peer conflicts and antisocial behavior at school as well as increasing prosocial knowledge and skills and overall social competence (See Fitzgerald & Van Schoiack-Edstrom, 2012 for a review).

### The Incredible Years

The *Incredible Years (IY)* is a research-based prevention program comprised of three interlocking training programs designed for children, parents, and teachers (Webster-Stratton et al., 2001). The goals of this comprehensive series are to treat children with aggressive behavior issues; prevent conduct problems and delinquency or drug abuse; promote social competence, emotional regulation,

and academic readiness; and provide children with effective problem-solving skills. Other important goals include improving the parent-child relationship, improving parental functioning by facilitating a more nurturing environment, and teaching parents more effective problem-solving skills. Since a large portion of this program also focuses on the student-teacher relationship, it provides teachers with better classroom management skills while creating a partnership between the teacher and parents.

The child program consists of a weekly small group therapy session where children learn to express the full range of emotions in socially appropriate ways. The core of the child program consists of a curriculum administered by the classroom teacher that focuses on other aspects of social-emotional development such as conflict resolution and anger management.

The teacher module of *IY* includes sections devoted to understanding the importance of teacher attention, praise and encouragement, motivation via incentives, being proactive with regard to behavioral issues, and building relationships with students in a positive manner, among other skills and information. Similarly, in the parent training module, the goal is to teach parents proactive discipline strategies as well as strategies for providing nurturance and support.

With regard to the effectiveness of this program, there is an abundance of research promoting the validity of the *IY* series. According to one review (Borden, Schultz, Herman, & Brooks, 2010), the *IY* curriculum significantly improves the relationship between the schools and the family in addition to reducing behavior problems, including aggression, among students. *IY* has been selected as an exemplary best practice program and model program by the Rand Corporation's *Promising Practices Network* and the *Center for the Study and Prevention of Violence* at the University of Colorado.

### Steps to Respect

*Steps to Respect* is a comprehensive school-based aggression prevention program targeting the dynamic and transactional nature of bullying

and other forms of aggression in the context of elementary classrooms. Rather than focusing exclusively on the aggressor or the victims of aggression, the program focuses on building a school-wide climate where aggressive behavior stands out because it violates acceptable norms. It is designed to help schools develop anti-aggression policies; enhance awareness of aggression, particularly in the form of bullying, and its impact upon students; and promote and reward prosocial behavior.

Since aggressive behavior occurs within the context of peer relations and the broader classroom environment, *Steps to Respect* seeks to assist schools by developing clear anti-aggression policies within the classroom and to educate school personnel and students about how to respond to incidents of aggression, as well as providing specific and systematic training in prosocial behavior. The classroom curriculum includes training in general social-emotional skills including emotional regulation as well as activities designed to change teacher and student attitudes toward high-frequency acts of aggression such as bullying. For example, some parts of the curriculum encourage students to consider the short- and long-term impacts of aggression on victims and to coach students in appropriate ways to respond to aggressive violations.

Numerous studies support the efficacy of *Steps to Respect* as a comprehensive intervention to reduce bullying and other forms of aggressive behavior in elementary-age children (See Frey et al., 2012 for a review). In randomized controlled outcome studies of the *Steps to Respect* curriculum, researchers have documented reductions in bullying behavior (Frey et al., 2005), declines in forms of relational aggression such as spreading rumors (Low, Frey, & Brockman, 2010), and enhanced self-efficacy on the part of bystanders to intervene in acts of aggression (Frey et al., 2005; Frey, Hirschstein, Edstrom, & Snell, 2009).

### What Is Promising

In addition to the comprehensive, multi-contextual approaches to aggression prevention

described above, there are some promising intervention strategies that promote positive behavioral alternatives to aggressive behavior by directly involving the classroom teacher or other supportive adults as models for socially appropriate behavior. Two of the more promising approaches are *Positive Behavioral Interventions and Supports* and *Big Brothers Big Sisters of America*, each of which is described in more detail below.

#### Positive Behavioral Interventions and Supports (PBIS)

*Positive Behavioral Interventions and Supports* (Simonsen, Sugai, & Negrón, 2008; Sprague & Horner, 2012) refers to a general theoretical approach to preventing aggressive behavior in children by proactively establishing expectations and incentives for nonaggressive behavior both at school and at home. The focus of *PBIS* is on establishing a social climate in which prosocial behaviors are the norm, providing instruction in the classroom and at home about how to behave in a prosocial manner, and reinforcing specific instances of those behaviors. Within the *PBIS* framework, behavioral strategies are utilized as needed depending on the level of support required by particular individuals. For example, students who are at risk of developing aggressive behavior patterns or are already on their way to such a trajectory are likely to require more intensive support in the form of skill training than their more adept peers.

Importantly, *PBIS* utilizes reliable and systematic data collection as a means for assessing the utility of specific intervention efforts. *PBIS* is a highly structured and comprehensive school-wide effort that teaches appropriate social behavior as the foundation for effective prevention of aggressive behavior in children and youth.

*PBIS* was developed at the University of Oregon in collaboration with the National Center on Positive Behavioral Interventions and Supports. Major components of *PBIS* are based on decades of research examining school discipline policies across a number of fields including psychology, education, public health, and criminology. A vast amount of literature has accumulated supporting

the use of *PBIS* as a means of deterring aggression in young children.

Sprague and Horner (2012) provide an excellent overview of much of the research conducted by groups at the University of Oregon (e.g., Horner et al., 2009; Sprague et al., 2002). In general, outcomes of these randomized controlled trials indicate reductions in problem behavior in *PBIS* classrooms, enhanced perceptions of safety by both students and teachers, and improved academic performance. In addition, many studies report reductions in specific antisocial behaviors such as aggression and vandalism as well as alcohol, tobacco, and other drug use.

#### Big Brothers Big Sisters of America

*Big Brothers Big Sisters of America (BBBS)* is a distinctive and nationwide program that uses one-on-one mentoring as a preventive aid targeting youth living with an array of disadvantages. Most children enrolled come from single-parent households or are otherwise economically disadvantaged, but *BBBS* also has specialty programs for those who come from marginalized ethnicities such as African-American, Hispanic, and Native American backgrounds, as well as children whose parent(s) is(are) in the military or have a parent who has been incarcerated. Founded in the early 1900s, Big Brothers Big Sisters has been in existence for more than a century and is composed of several hundred local agencies that serve more than 250,000 youth across the country.

The basic premise of the program is that adult mentors can serve as role models and supportive assistants in helping at-risk children to promote positive development and social responsibility. Rather than providing a specific curriculum or intervention protocol, Big Brothers Big Sisters depends on the influential impact of positive relationships to shape desirable behaviors. All mentors are volunteers ranging from teachers and seniors to firemen and police officers. The success behind *BBBS* lies within the process by which mentors and mentees develop a nurturing and influential bond that models and promotes prosocial behavior. More recently, Big Brothers Big Sisters programming has evolved to include

both community-based and school-based mentoring relationships, and research indicates that both are promising avenues for reducing aggressive behavior in children.

A recent evaluative study by Herrera, Grossman, Kauh, and McMaken (2011) examined outcomes associated with participation in Big Brothers Big Sisters within a sample of 1,139 9- to 16-year-old students in 10 cities nationwide. Results indicated that program participants, as compared to a control group, were more likely to report feeling supported by an adult at school, had more positive perceptions of school, and performed better academically. Other studies have demonstrated that Big Brothers Big Sisters participants are also less likely to engage in specific aggressive and anti-social behaviors, such as hitting, both within and outside school (Herrera, Sipe, McClanahan, Arbretton, & Pepper, 2000).

### What Does Not Work

What doesn't work to prevent or reduce aggression in childhood are primarily punitive strategies or exclusionary programs whereby aggressive students are suspended from school or otherwise removed from the normal school environment. These strategies are overly simplistic and ignore the dynamic interplay of individual and ecological factors that support aggressive behavior in children. Research indicates that punitive strategies may actually increase aggressive behavior, perhaps by modeling acts of aggression. Exclusionary strategies, based on the notion of "zero tolerance," serve to exclude the aggressive student from positive socialization experiences, while often increasing contact with other antisocial peers.

In addition, short-term interventions that do not include built in follow-up or generalization efforts are unlikely to produce significant or meaningful long-term changes in aggressive behavior.

### Summary

Clearly, there is no single strategy for eradicating children's aggression or for establishing a school,

family, and community climate that promotes prosocial actions and respect for all. The United States Department of Education in its document entitled "Preventing Bullying: A Manual for Schools and Communities" (United States Department of Education, 1998) specifies several considerations for schools, parents, and communities who are serious about the effort to prevent and/or reduce aggressive behavior, including bullying, in young children. These include (1) early intervention efforts beginning as children enter kindergarten and continuing throughout a child's formal education, (2) an ongoing commitment on the part of school and community personnel and strong leadership that will support this effort, (3) commitment to continuing staff development and training, (4) use of culturally sensitive materials that are developmentally appropriate to students, and (5) parental and community involvement in the planning and execution of programs. All of the above considerations illustrate the fact that prevention of childhood aggression requires a comprehensive and sustained effort involving multiple stakeholders including teachers and schools, families, the community, and the larger cultural context in which aggression occurs.

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## Attention Deficit Hyperactivity Disorder During Childhood

Miriam Mulrow<sup>1</sup>, Melinda Corwin<sup>2</sup>,  
Adam Schwebach<sup>3</sup> and Shu Yuan<sup>4</sup>

<sup>1</sup>Department of Human Development and Family Studies, Texas Tech University, Lubbock, TX, USA

<sup>2</sup>Department of Speech, Language, and Hearing Sciences, Texas Tech University Health Sciences Center, Lubbock, TX, USA

<sup>3</sup>The Neuropsychology Center of Utah, Clinton, UT, USA

<sup>4</sup>Department of Human Development & Family Studies, Texas Tech University, College of Human Services, Lubbock, TX, USA

### Introduction

There has been an explosion of research into various aspects of ADHD over the past several years. Even with all of this interest, however, there is still no confirmed method of preventing ADHD from occurring. There are some promising studies that suggest factors that may contribute to ADHD or its severity. Much work has been done on dietary contributions, exposure to natural environments, working memory training, mindfulness training, and rigorous physical activity.

Multimodal treatment that includes both behavioral intervention and medication, as well as neurofeedback, has been shown to help children with ADHD to function more like their peers without ADHD, when these treatments are sustained. Thus, children with ADHD who are treated with medication and behavioral interventions, with or without neurofeedback, are more likely than children with untreated ADHD to avoid some of the secondary problems that arise from living with ADHD. However, no treatment has been found, to date, that has effects that continue over the long term after treatment is terminated. Thus, treatment needs to be sustained for all but those children in whom ADHD symptoms subside on their own as children mature.

### Definitions

*Attention deficit hyperactivity disorder (ADHD)* is the most commonly diagnosed behavioral disorder of childhood. Core symptoms include developmentally inappropriate levels of attention, hyperactivity, distractibility, and impulsivity (National Institutes of Health [NIH], 2013) that appear before age 7 years, persist longer than 6 months, and create problems in multiple settings (e.g., home, school, work, peer group). Not all symptoms need to be present for a diagnosis. ADHD has also been called attention deficit disorder, hyperactive child syndrome, hyperkinesis, minimal brain dysfunction, hyperkinetic syndrome of childhood, and hyperkinetic disorder.

*Inattention* symptoms include carelessness, difficulty sustaining concentration, reluctance and difficulty organizing and completing work correctly, failure to follow through, tendency to lose things, excessive forgetfulness, and high distractibility. *Hyperactivity* refers to excessive movement, restlessness, fidgetiness, or excessive talking. *Impulsivity*, an inability to inhibit behavior, makes it difficult to stop and think before behaving or to delay gratification.

*Comorbidity* means the existence of two different conditions in the same person. ADHD is commonly comorbid with *conduct disorder (CD)* or *oppositional defiant disorder (ODD)*. These two terms are sometimes used interchangeably, although ODD may be more accurately described as an earlier, less severe disorder similar to CD.

### Scope

Prevalence estimates for ADHD range from 78–10 % to 3–10 % of the child population and 1–5 % of the adult population (NIH, 2013). Dulcan, Dunne, Ayers, Arnold, Benson, and associates (1997) report a prevalence of 10.1 % of males and 3.3 % of females aged 4–11 years in Ontario, Canada. Children with ADHD are at risk to repeat a grade, be suspended from school, exhibit conduct disorder and other behavioral problems, have delays in language development,

have memory deficits, make lower grades than they seem to be capable of making, and experience social rejection, depression, anxiety, accidental injuries, risk-taking behavior, poor sense of time, and sleep problems (Barkley, 1997; Rabiner, 2013). Family relationships are also impaired, with families of children with ADHD reporting more stress, frustration, disappointment, guilt, fatigue, marital dysfunction, divorce, apsycho-logical disorders including ADHD and depression in parents, and family therapy (Fisher, 1990). Individuals with ADHD consume numerous resources and attention from the health-care system, criminal justice system, schools, and other social service agencies (NIH, 2013). "Additional national public school expenditures on behalf of students with ADHD may have exceeded \$3 billion in 1995". Moreover, ADHD, often in conjunction with coexisting conduct disorders, contributes to societal problems such as violent crime and illegal substance abuse (NIH).

Long-term problems are common among adults with a history of ADHD in childhood. Some of these are more prevalent among adults who continue to have diagnosable levels of ADHD symptoms, but some occur even in those who no longer meet diagnostic criteria (Barkley, 1997; Rabiner, 2013). Among problems that have been reported at elevated levels in adults who have ADHD or who have a history of ADHD in childhood are occupational underachievement; substance abuse; depression; impulsivity; isolation; low educational attainment; early, unintended pregnancy; marital disruption; inadequate financial and other resources; poor coping skills; impulsive spending; arrests; gambling; accidents; impulsive aggression/violence; delayed development; poverty; excessive driving violations; failed marriages; and antisocial behavior. For example, among the children with ADHD followed prospectively into adulthood in various studies, 28 % experienced major depression, 75 % reported interpersonal problems, almost 10 % attempted suicide, 20 % committed acts of physical aggression, 36–52 % were arrested at least once, 30–32 % never completed high school, only 5 % completed a university

degree, 17 % contracted a sexually transmitted disease, and 42 % had their licenses suspended or revoked (Barkley, 1998).

## Theories

According to Barkley (1997), children with ADHD primarily lack self-control/self-regulation, and problems with attention are secondary. During development, a child's behavior gradually shifts from external to internal controls, rules, and standards, termed "self-control." Self-control requires the ability to delay response to stimuli long enough to consider those internal rules and standards and possible consequences of violating those rules and standards. Children with ADHD know the rules but lack ability to apply what they know before responding to stimuli.

In true ADHD, this lack of self-control is due to nature (biological causes) rather than nurture (parenting or other factors in the child's current environment) (Barkley, 1997). These same deficits interfere with the child's working memory, self-talk/internalized speech, sense of time, as well as ability to set and work toward goals. Lacking the ability to consider and respond to internal cues, children with these deficits respond much more readily to external, immediate consequences for their actions than to longer-term consequences. Thus, these children need a system of external prompts, cues, and feedback (Rabiner, 2013).

Attention restoration theory suggests that children with ADHD respond to natural environments because they provide an opportunity to "recharge" from situations that make high demands on their ability to direct their attention. This theory suggests that attention is either voluntary/directed or involuntary/natural. Voluntary attention requires conscious effort because it involves things to which it is not inherently easy to attend, thus leading to fatigue. Exposure to nature allows the child to use involuntary attention and rest from this fatigue (Rabiner, 2013).

## Current Research

Primary prevention involves identifying methods to prevent ADHD from occurring in the first place. ADHD has been strongly linked to genetic factors (Rabiner, 2013). A child with ADHD has a 64 % chance of having at least one parent with ADHD or a history of the disorder (Evans, Vallano, & Pelham, 1994). If researchers can identify which genes are implicated in ADHD, they may eventually be able to prevent the disorder from occurring; however, further research is needed. Secondary prevention involves identifying and treating ADHD (or risk factors for ADHD) early in hopes of eliminating problems that could occur because of the disorder. Tertiary prevention involves improving treatments for persons with ADHD so that they can function as optimally and successfully as possible throughout their lifespan. Much of the current ADHD research involves secondary and tertiary prevention, as described in the following paragraphs.

Dietary factors may contribute to ADHD symptoms in some individuals. If this is the case, then one possible way to prevent ADHD is to modify diet. Howard et al. (2011) found that a Western-style diet (i.e., foods that are high in total fat, saturated fat, refined sugars, and sodium) may be associated with ADHD. The researchers compared 1,799 adolescents regarding whether they had a “Western” or “healthy” diet pattern and whether their scores were high or low on their respective dietary type. Of those adolescents, 115 (approximately 6 %) had been diagnosed with ADHD. Findings revealed that a higher score for the Western-style dietary pattern was associated with an adolescent diagnosis of ADHD. However, because the study was cross-sectional in design, no causal conclusions could be made. One possible explanation could be that individuals who already have ADHD tend to make poorer food choices (i.e., higher score Western diets) rather than high score Western diets leading to ADHD. Additionally, this study did not examine dietary changes and their effects on ADHD symptoms. Thus, one cannot conclude that dietary changes will alter ADHD

characteristics. One other interesting finding from this study was that physical exercise at least twice per week was associated with statistically decreased odds of having ADHD.

Some studies have examined the benefits of physical activity for improving behavior and cognitive abilities in individuals with ADHD. Verret, Guay, Berthiaume, Gardiner, and Beliveau (2010) conducted an exploratory study with 21 children ages 7–12 years who had been diagnosed with ADHD. Results revealed that the group of children who participated in a 10-week fitness program involving moderate- to high-intensity physical activity demonstrated improved muscular capacities, motor skills, behavior (as reported by parents and teachers), and levels of information processing (sustained auditory attention). However, participants were not randomly assigned to the experimental versus control group, and parents and teachers were aware of the participants that received the fitness training; thus, overall conclusions are limited. Additional studies are needed that involve larger samples, random assignment to groups, and parent/teacher raters who are blind to treatment versus control group membership.

While there is no known method for preventing the onset of symptoms or diagnosis of ADHD, some studies have investigated how to prevent ADHD symptoms from worsening and/or negatively affecting the daily lives of individuals with ADHD in a detrimental way (i.e., tertiary prevention). The Multimodal Treatment Study of Children with ADHD (MTA Cooperative Group, 1999) involved 579 children from multiple sites who were carefully diagnosed with ADHD. Participants were randomly assigned to one of four group conditions as follows: (1) medication treatment only, (2) behavior treatment only, (3) combined medication and behavior therapy, or (4) routine community care (control group). The group who received combined medication and behavioral treatment showed greater benefits in terms of improved ADHD symptoms as well as decreased anxiety symptoms and slightly increased parent-child relations (as reported by parents), social skills (as report by teachers), and reading achievement. The experimental period

lasted for 14 months. However, results of a follow-up study conducted 22 months later revealed no indication that the benefits continued beyond the treatment period. Also, approximately half of the children in all four groups continued to meet the diagnostic criteria for ADHD. Three classes of children were identified, without respect to which treatment group they had been assigned, as follows: Class 1, who showed a gradual improvement over time; Class 2, who showed an initially larger improvement that was maintained over time; and Class 3, who initially showed a positive response but then returned to baseline symptom levels. It should be noted that Class 2 children came from families with a higher socioeconomic status (SES) and had higher scores on baseline measures compared to children in the other two classes.

Molina et al. and the MTA group (2009) completed a follow-up study 8 years after the initial study which revealed no significant differences on any of the 20 outcome measures based on the group to which individuals were initially assigned. Children from all four groups demonstrated improvement relative to baseline measures, and there was a decline in use of medication over time for all groups. Relative to the three different classes identified 8 years earlier, the Class 2 participants continued to demonstrate better improvements over time compared to Class 1 or Class 3 groups, indicating that initial response to treatment (regardless of the type of treatment) was a better predictor of longer-term outcomes than type of treatment. Despite overall improvement in functioning for the individuals with ADHD, these individuals still had higher incidences of antisocial behavior, delinquency, and academic struggles compared to same-age peers without any history of ADHD. Thus, additional information regarding tertiary prevention of ADHD is needed.

## Overview of Strategies

Primary prevention of ADHD is not yet possible; however, research in the area of genetics may someday allow us to prevent the disorder before it occurs. To date, no successful intervention has

been found that consistently prevents the dysfunction associated with ADHD throughout the lifespan. Promising strategies related to secondary and tertiary prevention of ADHD include diet modification, physical activity, and some combination of pharmaceutical and behavioral treatment. Individuals whose socioeconomic status (SES) is adequate may fare better compared to individuals with low SES. Additional research is warranted in these areas.

## What Works

Multimodal treatment consisting of medication plus behavioral intervention (MTA Cooperative Group, 1999) continues to be the most effective means of preventing long-term problems among children with ADHD, as long as that treatment is continued. Effects are not sustained when treatment is discontinued, for most children. There has been some concern about the abuse of medications for ADHD. Despite media attention suggesting otherwise, nonmedical use (abuse) of medications for ADHD among children decreased sharply from 2000 to 2011 (Johnston, O'Malley, Bachman, & Schulenberg, 2012), although being asked for ADHD medications by friends and family was still common. Furthermore, treatment with medication in childhood reduces the likelihood of criminal behavior and other negative outcomes in adulthood among children with ADHD who still have ADHD as adults (Lichtenstein et al., 2012).

While effect sizes are smaller than for multimodal treatment, a meta-analysis of studies of neurofeedback shows that this treatment leads to improvement in ADHD symptoms in the short term. Long-term efficacy has not been confirmed, but neither has it been confirmed for medication or behavioral treatment (Lofthouse, Arnold, Hersch, Hurt, & DeBeus, 2012).

There are credible, easily understood resources available for learning about effective treatments for ADHD, including websites for the National Institutes of Health's *The Multimodal Treatment of Attention Deficit Hyperactivity Disorder Study (MTA): Questions and Answers* (<http://www.nimh>.

[nih.gov/health/trials/practical/mta/the-multimodal-treatment-of-attention-deficit-hyperactivity-disorder-study-mta-questions-and-answers.shtml](http://nih.gov/health/trials/practical/mta/the-multimodal-treatment-of-attention-deficit-hyperactivity-disorder-study-mta-questions-and-answers.shtml)); CHADD, Children and Adults with Attention-Deficit/Hyperactivity Disorder (<http://www.chadd.org/Understanding-ADHD/Adults-with-ADHD/Evaluation-and-Treatment.aspx>); and Dr. David Rabiner's Attention Research Update Archives (<http://www.helpforadd.com/archives.htm>).

## What Is Promising

### Diet

Breastfeeding children for a minimum of six months has been found to be associated with lower levels of ADHD, when breastfed children were compared to children whose mothers did not breastfeed or breastfed for shorter periods of time (Kadziela-Olech & Piotrowska-Jastrzebska, 2005; Mimouni-Bloch et al., 2013).

Higher levels of DHEA were associated with fewer symptoms of ADHD, and treatment for ADHD increased levels of DHEA (Maayan et al., 2003; Strous et al., 2001).

Among children with low zinc levels, zinc supplementation was shown to reduce hyperactivity and impulsivity symptoms, but not inattention symptoms. Children with symptoms of hyperactivity and impulsivity should be tested for low zinc levels, but zinc supplementation by itself is not effective to treat or prevent ADHD.

Reduction in food additives for children who are sensitive to these additives has been shown to be effective in reducing ADHD-like symptoms. Meta-analysis indicates that artificial colors such as tartrazine significantly increase ADHD symptoms among some children diagnosed with ADHD (McCann et al., 2007; Schab & Trinh, 2004). Reduction of food additives has not been found to work for all or even most children who exhibit ADHD symptoms. However, it is probably worth trying with all children suspected of having ADHD. It is important to note that a child does not have to have ADHD to have a sensitivity to artificial food colors that results in behavioral or attention problems when these additives are consumed.

Essential Fatty Acids (Omega-3): Increasing omega-3 fatty acids reduces hyperactivity, and supplementation with EPA/DHA has been shown to improve inattention, hyperactivity, oppositional/defiant behavior, and conduct disorder among children with ADHD (Rabiner, 2013; Transler, Eilander, Mitchell, & Meer, 2010). These essential fatty acids can be found at high levels in fatty fish such as salmon and tuna as well as in flax seed.

### Exercise and Meditation

Mindfulness training has been shown to improve parent-child relationships in families of children with ADHD when both parents and children participate. It also was linked to reduced ADHD symptoms in parents', but not teachers' reports (van der Oord, Bögels, & Peijnenburg, 2012).

Rigorous physical activity that is done frequently and consistently is associated with improvements in neuropsychological functioning, as reported by both teachers and parents. However, this exercise alone is not enough to get children with ADHD into the range of children without ADHD (Rabiner, 2013).

### Working Memory Training

Children who participate in working memory training have fewer symptoms of ADHD as reported by their parents. However, studies have not shown significant improvements in academic performance as reported by teachers. A recent study by Green and associates (2012) reports that children with ADHD who have five weeks of working memory training in their homes score higher on a measure in the lab that predicts academic performance than controls. While promising, this study will have to be replicated, and studies using teacher reports will be needed before working memory training can be confirmed as effective for improving academic performance.

### Environment

Children who spend more time in sunlight have fewer symptoms of ADHD. This may be related to sleep disorders, which are common among children with ADHD. Places with higher solar

intensity have lower rates of diagnosis of childhood ADHD (Rabiner, 2013).

Several studies have suggested that time spent in nature reduces symptoms of ADHD. Taylor and Kuo (2011) examined this by having children take a 20-min walk in nature, then testing them on a standardized measure of attention and concentration. Those children who walked in nature exhibited higher levels of attention than those who walked in urban or suburban settings (Taylor & Kuo).

Children who are young for their grade have higher rates of diagnosis of ADHD, as reported by Evans, Morrill and Parente (2010) and Rabiner (2013). Thus, it is important to make sure that what is being observed is actually ADHD and not simply immaturity caused by the child being younger than average in his or her class. This is not a treatment or prevention strategy for ADHD, but is an important factor when considering whether or not a child actually has ADHD. In these cases, the child may need to wait a year before starting school to allow time to catch up with the rest of the class (Evans et al., 2010).

### What Does Not Work

Although there are many other reasons to restrict the amount of television a child watches, and some of these reasons (e.g., lack of exposure to sunlight, lack of exercise) are related to factors that may contribute to more severe symptoms of ADHD, eliminating television has not been shown to prevent ADHD from occurring.

*Elimination of Sugar.* The elimination of sugar from the diet has not resulted in significant improvement in ADHD symptoms. There are promising results being found from more complex dietary restrictions, but results to date suggest that most dietary restrictions may only be effective for a small subgroup of children who have both ADHD symptoms and food allergies or sensitivities (Dulcan et al., 1997).

*Severe Discipline.* Commonly, parents will initially deny the existence of a disorder in

their children with ADHD and will attempt to control their children's behavior with increasingly strict discipline. Although a highly structured environment has been shown to be effective in helping children with ADHD to manage their disorder, severe discipline has not. In fact, studies indicate that severe discipline contributes to a greater probability of negative outcomes among children with ADHD (Hoza et al., 2000).

*Medication Without Any Other Intervention.* Often, parents and teachers of children with ADHD are so relieved at the improvements seen in children's behavior after medication is introduced that they overlook the problems that still exist despite the use of medication (MTA Cooperative Group, 1999; NIH, 2013). Findings are clear that medication alone will not prevent long-term problems (Dulcan et al., 1997) among many children with ADHD.

### Summary

In summary, there is no way to prevent ADHD currently available. Multimodal treatment involving both medication and behavioral interventions, with medication continued over the long term, has shown the highest level of improvements in long-term outcomes. Neurofeedback has shown more modest levels of improvement and must also be continued in order to remain effective. A healthy diet, beginning with breastfeeding early and fatty fish or other sources of essential fatty acids and DHEA later, vigorous and frequent exercise, working memory training, mindfulness training, and spending time in nature and sunlight have all shown promise and are probably worth trying for all children with ADHD, in combination with multimodal treatment. Making sure a child actually has ADHD and not a deficiency in zinc, immaturity due to being one of the youngest children in a grade level, or sensitivity to food additives is also important. In some cases, a child who does have ADHD may need attention for both ADHD and one or more of these issues.



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### Further Reading

- CHADD: Children and Adults with Attention Deficit/Hyperactivity Disorder. <http://www.chadd.org/Understanding-ADHD/Adults-with-ADHD/Evaluation-and-Treatment.aspx>
- Dr. David Rabiner's Help for ADHD e-newsletter is a wonderful resource that summarizes research findings on ADHD for practitioners, educators, and parents. This link is to an archive of all of his newsletters. <http://www.helpforadd.com/archives.htm>
- National Institutes of Health. <http://www.nimh.nih.gov/health/trials/practical/mta/the-multimodal-treatment-of-attention-deficit-hyperactivity-disorder-study-mta-questions-and-answers.shtml>

## Bullying in Childhood

Pamela Orpinas<sup>1</sup> and Arthur M. Horne<sup>2</sup>

<sup>1</sup>Department of Health Promotion and Behavior, University of Georgia College of Public Health, Athens, GA, USA

<sup>2</sup>Department of Counseling and Human Development Services, University of Georgia, Athens, GA, USA

### Introduction

Aggression among children has been common throughout history and continues to be a major problem today. Neighborhoods and communities cannot support healthy child development, nor can schools be effective institutions of learning, if they are not first and foremost safe. Yet many young people face serious problems of bullying and victimization in their lives that could result in many missed opportunities for growing up as healthy young people. During the past decades, the problem of bullying among schoolchildren has been a major concern for many parents and educators around the world, as they have become aware of its negative, and sometimes deadly, consequences.

### Definitions, Consequences, and Scope

*Definitions.* Researchers frequently define bullying as aggressive acts that are repeated over time and directed against an individual who has less power. Thus from this definition, not all aggressive acts are bullying. The bullying behavior has three components. First, similar to all aggressive acts, the behavior is intentionally meant to hurt another person. For example, a boy injured as part of rough-and-tumble play would not be a victim of bullying or aggression. Second, the bullying acts are constant. An aggressive event that happens only once, though not desirable, would not fit the definition of bullying. Third, the perpetrator has more power than the victim (e.g., the victim is smaller, weaker, younger, or less

skilled) (Orpinas & Horne, 2006). An aggressive act that occurs between students of equal size and ability, without an imbalance of power, also would not be bullying. In spite of this definition, some researchers, educators, and policy makers use the term bullying less restrictively to refer to any act of aggression against school peers.

Bullying takes several forms. Bullying may be physical (e.g., hitting, pushing, or pulling hair), verbal (e.g., teasing, ridiculing, or threatening), gestural (e.g., making threatening or obscene gestures, giving mean looks, or rolling the eyes), or relational (e.g., leaving someone out of the group, not talking to someone, or spreading rumors). A more recent form is cyberbullying, which refers to using electronic devices to harass others (e.g., posting online rumors or embarrassing information or pictures; sending insulting or threatening messages via email, phone, or social networking sites; or impersonating someone else online). Bullying in the form of sexual harassment can take any of these forms (Orpinas & Horne, 2006).

The bullying situation frequently encompasses three persons or groups: the bully, the victim, and the bystander. Bullies can be aggressive or passive. The *aggressive bully* usually initiates the aggression and most commonly uses physical and verbal aggression. The *passive bully* does not initiate the aggression, but follows along, joins in, or encourages others to be aggressive (Newman, Horne, & Bartolomucci, 2000). Targets of bullying are often referred to as *victims*. This term is misleading, as victimization implies a lack of ability to protect oneself, which is sometimes inaccurate. Victims can be passive or provocative. *Passive victims* are singled out without provocation, because they have some characteristics that make them more vulnerable, such as not conforming to mainstream, having few friends, lacking social skills, or simply being different. *Provocative victims* are those whose inappropriate behavior continuously annoy or provoke the bully. Bystanders, those who witness the bullying, can also be categorized into two groups: those who are part of the problem and those who are part of the solution. *Bystanders who are part of the problem*

encourage others to retaliate or may pass rumors to enrage the bully. *Bystanders who are part of the solution* will try to solve or defuse the problem.

*Consequences.* The effects of bullying can be far-reaching and may have an impact long after childhood. Consequences of being the target of aggression may include depression and suicidal ideation (Hawker & Boulton, 2000), somatic complaints (Wolke, Woods, Bloomfield, & Karstadt, 2001), and low self-esteem (O'Moore & Kirkham, 2001). The targeted students are likely to have poor social skills, report feeling unhappy and lonely, and have few friends (Boulton & Underwood, 1992). Having a larger number of friends reduces the likelihood of victimization, particularly if those friends are not being victimized themselves (Fox & Boulton, 2006). Victims are also likely to avoid going to school because they fear for their safety (Berthold & Hoover, 2000). An examination of bullying in 28 countries showed that victims were significantly more likely than non-victims to report physical symptoms (headache, stomach ache, backache, dizziness) and psychological problems (bad temper, feeling nervous, feeling low, difficulties in getting to sleep, morning tiredness, feeling left out, loneliness, helplessness), and the risk of having physical or psychological symptoms increased with the frequency of bullying (Due et al., 2005).

In extreme situations, bullying may result in permanent physical injuries or even death. Dramatic events of school shootings and adolescent suicide have heightened the attention on the seriousness of the problem of aggression. In an examination of the characteristics of students who bring weapons to school and shoot others revealed that over two-thirds of the incidents had a common theme: acting out of anger or revenge for having been victimized by other students in the school (Vossekuil, Fein, Reddy, Borum, & Modzeleski, 2002).

*Scope.* While the exact number of bullying incidents in schools and communities is difficult to measure, three nationwide surveys in the United States provide a good estimate of the extent of the problem. The Division of

Adolescent Health of the Centers for Disease Control and Prevention monitors high-risk behaviors of youth, including injuries and violence, using the Youth Risk Behavior Survey (YRBS). A nationally representative sample of high school students attending public and private schools in the United States completes this biannual survey. In 2011, for the second time, the YRBS included one question on bullying victimization. Nationwide, 20 % of high school students reported being bullied on school property, ranging between 24 % in ninth grade and 15 % in twelfth grade (Centers for Disease Control and Prevention, 2012).

In the 2011 School Crime Supplement to the National Crime Victimization Survey, 28 % of students aged 12–18 years reported being bullied at school, ranging between 37 % in sixth grade and 22 % in twelfth grade. The most common form of bullying was being made fun of (18 %); being subject of rumors (18 %); being pushed, shoved, tripped, or spit on (8 %); being excluded from activities on purpose (6 %); being threatened with harm (5 %); and trying to make them do things they did not want to do or having their property destroyed on purpose (3 %). In addition, 9 % reported being the victims of cyberbullying (Robers, Kemp, & Truman, 2013).

Nansel and colleagues (2001) conducted a survey of a nationally representative sample of students in Grades 6–10 in public and private schools throughout the United States. Of this sample, 44 % reported bullying others (25 % once or twice, 11 % sometimes, and 9 % weekly), and 41 % reported being the victim of bullying (24 % once or twice, 9 % sometimes, and 8 % weekly). Among those who reported being bullied, the five most common types of bullying behaviors were being belittled about looks or speech (62 %); being the subject of rumors (60 %); being hit, slapped, or pushed (56 %); being the subject of sexual comments or gestures (52 %); and being belittled about religion or race (26 %).

Results from the three surveys conducted in the United States have a number of common elements. First, bullying was a prevalent problem among youth. Second, the prevalence of bullying

victimization was higher among girls than boys. Third, the prevalence of bullying victimization was higher among White students than students of other races or ethnicities. Fourth, middle school students reported the highest prevalence bullying, and this behavior decreased through high school.

International comparisons have shown large differences of bullying behaviors across countries. The study by Nansel and colleagues was part of the World Health Organization's Health Behavior in School-aged Children survey, which included numerous European countries and Canada. Prevalence varied greatly by country, being lowest in Sweden (13 %) and highest in Austria (74 %) (Mercy, Butchart, Farrington, & Cerdá, 2002).

## Theories

First and foremost, bullying is a learned behavior, as highlighted by *Social Cognitive Theory* (Bandura, 1986). While evidence is increasing that there is a genetic component on physical aggression, the response to anger and social aggression is learned. Similar to other behaviors, bullying is learned by observing other people's behavior but most importantly by observing which behaviors are rewarded, ignored, or punished. This theory posits that when rewards outweigh the punishment, the behavior will persist. Other relevant constructs are self-efficacy for responding with aggression and, conversely, for managing conflict in peaceful ways; outcome expectations of the consequences of behaving aggressively; and self-control over own behavior.

Not all children are equally likely to act as a bully or become a victim. Understanding bullying and victimization requires recognition that the problem, as well as the solution, may exist at different levels or, more likely, as a function of an interaction of different levels of influence. The *Ecological Model* (Bronfenbrenner, 1979) is a framework that can be used to understand these multiple factors that influence students' behavior, as well as the multiple levels of interventions that can be developed. The model can be visualized as concentric circles, in which the

child is the center, surrounded by multiple levels of influence. Most important are the family, the school (including peers, teachers, administrators, and staff, as well as school policies), the community where the child lives, and the greater society that influences cultural norms about violence. These levels provide the opportunities to observe and learn from others' behaviors and their consequences. Additional risk and protective factors at each level will influence whether the bullying behavior will be enacted (For a detailed review, see Orpinas & Horne, 2006).

More specific to bullying, Orpinas and Horne (2006) proposed the *School Social Competence Development and Bullying Prevention Model* to provide an organized, comprehensive view of the critical components necessary for preventing bullying in schools. The model has two components: the students and the school. The model highlights six interrelated areas to address with students: (1) awareness of the problem, (2) personal skills for handling emotions in social situations (e.g., impulse control, recognition of others' feelings, anger management), (3) influence of cognitions on emotions and behavior, (4) character education for acting in ethical ways, (5) social skills for solving conflicts and relating to others respectfully, and (6) mental health and learning abilities. At the school level, the model highlights eight critical areas for promoting a positive school climate and reducing bullying: (1) excellence in teaching; (2) school values that support respect for all and define bullying as unacceptable; (3) awareness, at the school level, of problems to solve and strengths to capitalize on; (4) clear policies for bullying prevention and accountability of offenders; (5) environment of caring and respect; (6) positive expectations of students; (7) support for teachers to handle the daily stress, prepare lessons, and juggle the barrage of demands placed on them; and (8) a physical environment that is safe, clean and aesthetically pleasant.

## Current Research

While the characteristics and consequences of bullying have been thoroughly investigated and

are now well known, the understanding of what constitutes an effective bullying prevention program is still in its infancy. Probably the earliest and most comprehensive school-wide program for bully reduction was the Norwegian Campaign Against Bullying (Olweus, 1994). Because of this early success, the Center for the Study and Prevention of Violence at the University of Colorado identified it as meeting a high scientific standard of program effectiveness. However, this program was implemented in the 1980s in Norway, a very homogenous society and quite different from the other European countries and from the United States. So far, independent researchers have not published a replication of its positive original results in the United States. In a nonrandomized study of middle schools, researchers from the University of Washington (Seattle, WA) found no overall effect of the Olweus program, but pointed to a reduction in relational and physical victimization among White students. Thus, the authors warn about the importance of understanding the roles of culture, poverty, and race on program development (Bauer, Lozano, & Rivara, 2007). In an evaluation of the program in six public elementary and middle schools of mostly African American students in Philadelphia, the observed bullying incidents decreased in a 4-year time period, but the self-reported victimization did not change (Black & Jackson, 2007). Because the study did not include control schools, the reduction could be attributed to other external events (e.g., changes in district policies) or observer bias.

Numerous studies have shown inconsistent or no results. A peer support service to counteract bullying showed no effect on reducing bullying among a sample of boys in England (Cowie & Olafsson, 2000). The Toronto Anti-Bullying Intervention showed a decrease in the number of children who had been victimized, but an increase in the number of children who reported bullying (Pepler, Craig, Ziegler, & Charach, 1994). The Sheffield Anti-Bullying Project, implemented in England in the early 1990s, is a comprehensive school-wide program that included anti-bullying policies, a curriculum, environmental changes, and individual work

with bullies and victims. Results were inconsistent among participating schools, and the reduction of bullying was only observed among boys and, in several schools, bullying among girls increased (Eslea & Smith, 1998). The Flemish anti-bullying intervention, based on the principles of the Olweus program, showed no intervention effect on secondary schools and a mixed pattern of effects in primary school: a small, albeit significant, reduction of bullying but no change in reported victimization. Intervention schools were divided into those with and without external support from the investigators; this external support did not affect the impact of the intervention (Stevens, Bourdeaudhuij, & Oost, 2000). The Multisite Violence Prevention Project, a large clinical trial involving 37 schools, showed a reduction of aggression among students with multiple high-risk characteristics and an increase of aggression among low-risk students (Multisite Violence Prevention Project, 2009).

In spite of these disappointing results, a large meta-analysis of mostly European bullying prevention studies showed an approximately 20 % reduction of bullying (Ttofi & Farrington, 2011). However, many studies showed no effect, and several had a positive effect on reducing perpetration or victimization, but not both. In general, effects have been stronger for younger children and for very intensive programs.

The mixed results from intervention studies call for more research to further understand which strategies have the strongest impact, under which conditions programs are effective, and how programs influence behavior. Based on current research, most researchers agree on five general educational best practices that will prevent and reduce bullying. These strategies have in common that they are a process, rather than a specific program.

*Obtain strong support from administrators and teachers.* The success of violence prevention programs partially depends on the level of support at different levels within the school and the school district, as well as the community. Particularly important is the quality of leadership that principals provide. Administrators should



embrace and model treating everyone with respect, provide clear standards for what is expected from all members of the school community, maintain high academic standards, and be abreast of successful research and practices for reducing bullying (Bosworth, 2000).

*Increase awareness.* As with any change program, being aware of the problem is a critical first step to success. In the prevention of bullying, administrators, teachers, parents, and students should be able to define bullying, identify the consequences of engaging in that behavior, and know that the school administrators will take prompt action. Most students do not believe that teachers are aware of the extent of bullying or equipped to handle it (Hoover, Oliver, & Hazler, 1992). Frequently, bullies remain unchallenged as adults do not speak with them about their behavior (O'Moore, 2000). Awareness of the characteristics of bullying is an important component of most bullying prevention programs (Fonagy et al., 2009; Frey et al., 2005).

Administrators and teachers can increase their awareness of the problem through anonymous classroom or school surveys, interviews with students and parents, and school data on absenteeism and conduct problems. As part of awareness training, teachers can analyze the extent of students' concerns and examine their own personal beliefs that impede change (e.g., a belief that bullying is a normal condition all children experience and must learn to deal with or a belief that the problem does not even exist). Examining teachers' beliefs that maintain bullying and developing efficacious approaches to addressing the problem can help motivate teachers to take action. Awareness training should emphasize all forms of aggression as adults are more likely to be aware of verbal and physical aggression but not of other forms of bullying (Boulton, 1997).

*Act promptly.* Although strategies to confront the bullies may vary (Rigby, 2010), theory, research, and practice indicate that the problem must be solved quickly and efficiently.

*Maintain a positive school and classroom climate.* A positive school climate influences behavior through several mechanisms. First, it favors

students' connectedness to school, which is related to reduced aggression. Second, in a positive environment adults are more likely to model good relationship skills and reinforce students' positive behaviors. Third, implementation of programs is extremely difficult in dysfunctional and conflict-prone schools (Bosworth, Orpinas, & Hein, 2009).

*Provide services for victims.* The school should also provide services to support children who are the targets of bullying. Although victims should not be blamed for the bullying, sometimes skills training can help the victim overcome or minimize the problem. A study conducted in Finland showed that victims' responses of counteraggression or helplessness were more likely to make bullying start or continue, while a nonchalant attitude by the targeted student was perceived as making bullying diminish or stop (Salmivalli, Karhunen, & Lagerspetz, 1996). Similarly, in a study of young children in the United States, fighting back was associated with maintained victimization among boys (Kochenderfer & Ladd, 1997).

## What Works

No bullying prevention programs meet the requirement of three successful randomized control trials.

## What Is Promising

Three small studies evaluated the impact of the BullyBusters program on students' aggressive behaviors (Newman et al., 2000). The goal of this program is to increase teachers' awareness of the role and impact of bullying in schools and to encourage them to take active steps to prevent and reduce bullying by providing learning experiences in the classroom, increasing monitoring of behaviors outside of the classroom, and developing an open-door policy for students who seek help with bullying problems in the school. Sixth grade teachers who participated in this program, compared to teachers who did not, developed

a greater knowledge of and skill in using prevention and early intervention activities, had an increased sense of self-efficacy, and had more positive expectations for students (Howard, Horne, & Jolliff, 2001). In a second study, middle school students of teachers engaged in the BullyBusters program had fewer disciplinary problems and had fewer office referrals for aggression than students in classrooms in which teachers did not participate in training (Newman-Carlson & Horne, 2004). The third study of BullyBusters examined a group training program for teachers and students and found that the intervention resulted in improved efficacy and confidence, as well as better classroom management skills (Horne, Stoddard, & Bell, 2008). Middle and high school students completed a computer-based intervention based on the transtheoretical model. Students in the intervention groups were four times more likely to progress from action to maintenance of non-bullying than students in the control condition (Evers, Prochaska, Van Marter, Johnson, & Prochaska, 2007).

Generally, the impact of bullying prevention programs in elementary schools has been more promising than those in middle school. In a single-school study, Orpinas, Horne, and Staniszewski (2003) found a strong reduction in aggression and victimization among lower elementary students and only a reduction in victimization among upper elementary students. This research differs from other studies in that the intervention was developed through a strong collaborative relationship between the school personnel and university consultants and the educators strongly embraced the program as their own. A school-wide program for upper elementary students based on increasing awareness of others thoughts and feelings showed a significant, albeit small, impact on aggression (Fonagy et al., 2009). Steps to Respect showed positive changes in students' beliefs about aggression but not self-reported aggression (Frey et al., 2005). In Australia, PEACE Pack showed promising results with elementary schools, particularly when the intervention was implemented faithfully (Slee & Mohyla, 2007).

Social Skills Group Intervention (S.S.GRIN) – a program for children who are rejected, victimized, or socially anxious – showed positive impact on social, emotional, and behavioral domains (DeRosier & Marcus, 2005).

### What Does Not Work

Several strategies do not work or may even have negative results. First, perhaps the least effective strategy is ignoring the problem, as the lack of negative consequences is likely to maintain the behaviors. Second, research from the past 20 years does not support zero tolerance policies (American Psychological Association Zero Tolerance Task Force, 2008). These extreme policies do not enhance a positive school environment and discourage the reporting of bullying. Third, because bullying is by definition an abuse of power, not a conflict, peer mediation and conflict resolution strategies do not work. Fourth, working with homogeneous groups of only bullies is not only ineffective, but may reinforce the negative behaviors. Finally, bullying prevention requires a long-term commitment from the school. Short-term activities, an isolated curriculum, or a brief conversation with the counselor are not likely to have a long-term effect. Schools need to keep an ongoing monitoring of bullying to evaluate whether or not their programs are working.

### Summary

Bullying is a prevalent problem in schools. Children who are the victims are likely to suffer severe emotional, physical, and academic consequences. In theory, a comprehensive program that involves the community, neighborhoods, families, and the school should be most effective for reducing bullying. However, most communities do not have the resources to develop such programs, and not every member of the community will support it. Schools can establish a safe haven for children by defining bullying as an unacceptable behavior and taking specific steps to curtail it.

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## Cancer During Childhood

Alyce D. Fly and James E. Klaunig  
 Indiana University, Bloomington, IN, USA

### Introduction

Cancer is a disease characterized by mutation, modified gene expression, cell proliferation, and aberrant cell growth. In the USA it ranks as the second leading cause of death with over one million new cases of cancer in adults diagnosed each year. In children (under 15) in the USA, an average of over 12,000 cases of cancer are diagnosed annually (American Cancer Society [ACS], 2012). While childhood cancer is rare compared to adult cancer incidence, its effects on the recipient as well as the family can be devastating and deadly. This entry defines cancer and reports on the major types of cancers found in children, followed by factors that have been associated with cause and increase cancer risk. In addition, potential strategies to prevent cancer are reviewed.

### Definitions and Scope

Cancer is the development of abnormal cells that proliferate with limited growth control. Cancer cells have the ability to infiltrate and destroy normal body tissue and can spread (metastasize) throughout the body (Mayo Foundation for Medical Education and Research, 2012). Neoplasia is defined as new autonomous growth of cells. A neoplasm can be either benign or malignant. Benign neoplasms are characterized by expansive growth, usually having a low but steady rate of growth that does not invade surrounding tissue or other organs. Benign neoplasms however can impair and damage the normal function of a tissue organ by affecting normal blood flow and lymphatic drainage. In contrast a malignant neoplasm (cancer) shows invasive growth characteristics and is capable of spreading through both the tissue of origin and other tissues via metastasis. Metastases are secondary growths

**Cancer During Childhood, Table 1** Neoplasm nomenclature

Tissue of origin	Benign	Malignant
Bone	Osteoma	Osteosarcoma
Fibrous tissue	Fibroma	Fibrosarcoma
Hematopoietic cells	– <sup>a</sup>	Leukemias
Lymphoid tissue	– <sup>a</sup>	Lymphoma
Renal epithelium	Renal adenoma	Renal cell carcinoma
Liver	Liver cell adenoma	Hepatocellular carcinoma
Respiratory	Bronchial adenoma	Bronchogenic carcinoma
Skin	Squamous cell papilloma	Squamous cell or carcinoma
Colon	Adenomatous polyp	Adenocarcinoma

Created by author, James Klaunig, 2012

<sup>a</sup>No benign lesion

of the malignant neoplasm. The term tumor is a general term that is used to describe the neoplastic lesion as it appears in gross examination. Neoplasms are named based on the tissue they originate from and whether they are benign or malignant. In the case of benign neoplasms, the tissue of origin is frequently followed by the suffix “oma.” For example, a benign fibrous neoplasm would be termed fibroma, and a benign glandular epithelium neoplasm would be termed an adenoma. Malignant neoplasms from epithelial origin are called carcinomas, while those derived from mesenchymal origin are referred to as sarcoma. As such a malignant neoplasm of fibrous tissue would be a fibrosarcoma and one from bone would be an osteosarcoma. A malignant neoplasm from the liver would be a hepatocellular carcinoma, while that derived from skin squamous epithelium is a squamous cell carcinoma (Table 1).

### Childhood Cancer

Childhood cancer encompasses cancers that develop between birth and 15 years of age (National Cancer Institute, 2012a). Though cancer in children is rare, it is the leading cause of death by

**Cancer During Childhood, Table 2** Leading causes of death in children from preliminary data in 2009. Data are numbers of deaths per 100,000 children

Cause of death	Children, 1–4 years	Children, 5–14 years
Unintentional injuries	8.5	4.1
Birth defects	2.8	0.9
Homicides	2.3	0.8
Cancers	2.3	2.4
Heart disease	0.9	0.5
Flu and pneumonia	0.8	0.2
Infections	0.4	–
Cerebrovascular diseases	0.4	0.2
Suicide	– <sup>a</sup>	0.7
Chronic lower respiratory diseases	–	0.3

Modified by author, Alyce Fly, 2012 from U.S. Department of Health and Human Services, Health Resources and Services Administration, Maternal and Child Health Bureau, 2011

<sup>a</sup>These causes of death are not among the leading causes for children in this age range

diseases (Table 2). The National Cancer Institute (NCI) has developed a useful fact sheet about childhood cancer (National Cancer Institute, 2012b).

This institute also works to identify the causes of cancers found in childhood, monitors the incidence of childhood cancers in the USA and worldwide, funds studies to understand the biology of childhood cancer to identify possible new treatments, conducts animal trials in search of new medications, conducts clinical trials to identify best treatments for cancer, with less toxic side effects, and conducts studies to improve knowledge of issues that affect survivors of childhood cancers.

The most prevalent forms of cancer in children are found in the blood (leukemia) or in the brain and central nervous system (National Cancer Institute, 2012b). Brain tumors are the most common solid tumor in children and are frequently in the form of gliomas (from glial cells, a supportive cell in the central nervous system) or medulloblastomas (found in the cerebellum).

Other solid tumor types seen in children include neuroblastomas (which arise from the adrenal gland near the spinal cord or the chest),

**Cancer During Childhood, Table 3** Relative distribution of types of cancer in children

Types of cancer	% of all cancers in children <sup>a</sup>
Leukemias	34
Brain and other nervous system cancers	27
Neuroblastoma	7
Wilms tumor	5
Lymphoma	8
Rhabdomyosarcoma	3
Retinoblastoma	3
Bone cancer	4

Modified by author, Alyce Fly, 2012 from ACS (2012)

<sup>a</sup>ACS (2012)

kidney tumors (Wilms tumors), and sarcomas such as rhabdomyosarcoma (from muscle cells), and osteosarcoma (bone cell derived). Lymphomas, tumors of the lymphatic system, are also found in children. The most common types of childhood cancers as a percentage of all childhood cancers are shown in Table 3. Among the major types of childhood cancers, leukemias and cancers of the brain and central nervous system account for more than half of the new cases. Over 30 % of all diagnosed childhood cancers are leukemias with the most common type being acute lymphoblastic leukemia in children. Descriptions of these cancers can be found on both the American Cancer Society website and National Cancer Institute website. The incidence of childhood cancers in 2013 was expected to be 11,630 (ACS, 2013). White and Hispanic children are more likely to develop cancer than children from other racial/ethnic groups. There has been an increase in the incidence of childhood cancers over the past 30 years, but the mortality rate has decreased dramatically due to improved treatments (Ries et al., 2006).

## Theories and Research

### Causes

Very little is known about the causes of most childhood cancers. Risk factors can be classified as environmental or genetic. The gene-environment interaction appears to be important



in the increased risk. It also remains unresolved if environmental factors contribute to the cancer development; when did the exposure occur? Exposure could occur preconception in the zygotes, in utero, or post birth. Since both the fetus and children have rapidly dividing tissues and cells during growth, they are exceptionally susceptible to agents that interact with nuclear DNA either directly or through epigenetic mechanisms. A number of environmental and extrinsic causes of childhood cancer have been suggested including ionizing radiation, nonionizing radiation, infections, drugs and medication, smoking, and occupation of parents.

### **Ionizing Radiation**

Environmental ionizing radiation has been proposed to cause an increase in childhood leukemia. The strongest support for ionizing radiation as a cause of childhood leukemia comes from studies of children with cancer who have been treated with radiation and found to have an increased risk for developing a second primary cancer as a result of the treatment. In addition, during the early second half of the twentieth century, a source of ionizing radiation was from the practice to use x-rays during obstetric examination in pregnancy (Stewart, Webb, & Hewitt, 1958). This process, which has since been replaced by ultrasound, has been linked to increase in childhood cancer. There is no evidence that ultrasound causes childhood cancer. Increases in incidence of leukemias have been attributed to nuclear power plants; however, fallout from the Chernobyl nuclear power plant accident in 1986 failed to show an increase in leukemia in children exposed to the fallout (Spix, Schmiedel, Kaatsch, Schulze-Rath, & Blettner, 2008). Studies have also examined the risk of childhood leukemia in subjects living near nuclear power reactors with inconsistent findings (Bithell, Dutton, Draper, & Neary, 1994).

Preconception exposure to ionizing radiation has also been suggested as a cause of childhood leukemia. Studies of children born to radiation workers in the UK were performed and concluded that a linkage between leukemia and occupational exposure to radiation was not evident (Draper et al., 1997). Similarly, a proposal that

indoor radon levels could cause an increased risk of childhood leukemia has been generally dismissed save for a large study in France where an increased risk of acute myeloid leukemia was reported to correlate with higher levels of radon in houses (Investigators United Kingdom Childhood Cancer Study [UKCCS], 2002; Evrard et al., 2006).

A new study showed that radiation exposure from computed tomography (CT) scans in childhood produces very small but increased risks of both leukemia and brain tumors within the first 10 years after exposure. These investigators calculated that the cumulative dose from two to three head CT scans could triple the risk of brain cancer, and the cumulative dose from five to ten head CT scans before the age of 15 could triple the risk of leukemia (Pearce et al., 2012).

### **Nonionizing Radiation**

Nonionizing radiation as a cause of childhood cancer has been studied extensively. In particular there has been extensive analysis of cancer in children, specifically leukemia, from exposure to electromagnetic fields from power lines and electrical wiring (Draper, Vincent, Kroll, & Swanson, 2005). An increased risk from high electromagnetic exposure has been suggested, although concerns about other confounding factors leave this potential cause unresolved. UV light from sunlight exposure has been linked to melanoma induction in both adults and children.

### **Drugs and Medication**

While there has been conjecture that material use of drugs and medication during pregnancy produces an increase in childhood cancer, the only strong linkage has been the study of diethylstilbestrol (DES) given to pregnant women for prevention of miscarriage and the subsequent induction of vaginal adenocarcinoma in young women and in several cases of girls under the age of 15 (Giusti, Iwamoto, & Hatch, 1995). Other drugs, specifically those used in the treatment of cancer in young children (chemotherapeutic drugs) have been linked to an increase in additional primary cancers.

### Smoking

Parental smoking, during pregnancy, has been linked to an increase in hepatoblastoma and possibly leukemia in offspring, based on four recent studies (Pang, McNally, & Birch, 2003). This risk is increased over fivefold when both parents smoke.

### Occupation of Parents

A number of studies have attempted to show associations between the occupation of the parents and the risk to childhood cancer in their offspring. However, a review of almost 50 studies on this topic showed little consistency and limited associations between occupation and the cancer risk in children (McKinney, Fear, Stockton, & Investigators UKCCS, 2003).

### Genetic Factors

Several childhood cancers have demonstrated a genetic linkage to their development. These include retinoblastoma, adrenocortical carcinoma, atypical teratoid and malignant rhabdoid tumors, optic pathway tumors, juvenile myelomonocytic leukemia, malignant peripheral nerve sheath tumors, vestibular schwannomas, hepatoblastomas, hemangioblastomas, medullary thyroid cancer, pheochromocytomas, and paragangliomas. As noted above, genetic mutations are essential for a normal cell to be a neoplasm. Genetic changes may either be inherited from the parents or acquired during gestation. Retinoblastoma is an example of a type of cancer which is known to be caused by an inherited gene in some children. The majority (90 %) of children born with the mutated *Rb1* gene develop retinoblastoma. However, having a genetic predisposition (having a mutation in a cancer-related gene present) does not necessarily lead to the induction of cancer in that individual. There is evidence that children who develop leukemia have predisposing genetic mutations apparently acquired during gestation, though for every child leukemia with the genetic predisposition for the disease, there appears to over 100 children that have the mutation but do not develop leukemia. In addition, certain genetic syndromes (e.g., Li-Fraumeni syndrome,

neurofibromatosis, and Gorlin syndrome) have been linked to an increased risk of specific childhood cancers. Children with Down syndrome have an increased risk of developing leukemia. This further supports a role for genetic modification and mutation in the development of childhood cancer. These findings also further support the role of the gene-environment interaction in the development of cancer and also point to the multistep process of cancer induction. Cancer formation is not a single damaging genetic event but requires multiple steps and modifications, some genetic and some epigenetic.

### Pesticides and Xenobiotic Chemicals

In recent years, pesticides have been suggested to be involved in the cause of certain forms of childhood cancer (Metayer & Buffler, 2008). Most of the studies to support a role for chemical and pesticide exposure are founded on interview-based epidemiological data. Interview results have been inconsistent and a linkage between physical evidence of pesticides in the child's body or environment and the induction of specific cancers has not been firmly established. This is an area of scientific inquiry that is receiving additional attention. Certainly, the role of environmental factors whether lifestyle-derived or through xenobiotic chemical exposure has been demonstrated in cancer models. However, linkage either directly or indirectly between pesticides and other xenobiotic chemicals and childhood cancer remains unresolved.

### Strategies

Early detection of childhood cancer is on the forefront to subsequent treatment and cure. In recent years treatment of children with cancer has progressed to the stage where certain cancers have a high cure and survival rate. Treatment of cancers follows the similar approach to those employed for adult cancers with the caveat that children are not small adults and require different doses and modalities for treatment. Surgery, chemotherapy, and radiation therapy remain the

prominent approaches to cancer treatment in children, as they are also for adults.

### **Surgery**

Surgery involves the removal of the neoplasm in its entirety. Of course surgery is applicable to the solid tumors and not the liquid (leukemia) neoplasms. The most successful outcome from surgery is dependent in part on finding and diagnosing the lesion early in its progress, prior to subsequent metastasis. Surgery, as with adults, is frequently followed by radiation or chemotherapy to ensure all tumor cells have been eliminated.

### **Chemotherapy**

Chemotherapy involves the use of drugs to kill neoplastic cells. These drugs are designed to specifically target rapidly growing and dividing cells (a hallmark of cancer cells). In children the dosage, type, and duration of treatment are particularly difficult since many of the child's cells are normally dividing because children are still growing (unlike adults) and the ability to specifically kill those cancer cells involves fine-tuning of the therapeutic dosing. Chemotherapy may involve a single drug or combinations of different drugs. The side effects of chemotherapy can be difficult and include fatigue, decreased appetite, increased risk of infection and bleeding, nausea, and gastrointestinal distress. Additional supportive care may be required to combat these side effects.

### **Radiation Therapy**

Radiation therapy uses x-rays or protons to selectively target and kill cancer cells. Most radiation therapy involves application through an external source of radioactivity and also requires multiple treatments over a period of time. The basis of radiation therapy is that dividing cells are usually more sensitive to the radiation effect and thus are more likely to be killed. Radiation therapy also, unlike chemotherapy, usually is targeted to the tumor itself and not the whole body and thus the nontarget normal cells are spared. As with chemotherapy side effects occur that include fatigue, nausea, and diarrhea.

## **Prevention**

### **What Works**

Unfortunately, because of the lack of specific knowledge of the cause of childhood cancer, specific guidance for the prevention of this disease is limited. As with adult cancer, lifestyle is important in the prevention of disease. Though in the case of childhood cancer, the lifestyle issues may be less oriented to the child as much as the parents both prior to conception (effects on the germ cells) and during pregnancy.

### **What Might Work**

#### **Prevention Approaches Directed to the Child**

Childhood prevention should include maintenance of a healthy diet with adequate antioxidants and vitamins and minerals. Reduction in exposure to radiation (which is linked to leukemia and possibly brain tumors in children) is preferred both from external exposure (nuclear power plants and radon) and medical diagnostic approaches (x-rays). While the linkage between these radioactive sources and childhood cancer remains uncertain, genetic predisposition, as noted above, may make selective children more susceptible to the detrimental effects.

UV light exposure and melanoma (as well as other skin tumors) have been strongly linked; however, the induction of skin tumors usually requires multiple decades to appear after the UV exposure, thereby probably not being a cause of childhood tumors. However, limited UV exposure during childhood will reduce the melanoma incidence in later life.

Exposures to chemicals such as pesticides and solvents have not been definitively linked to cancer induction in children. Pesticides have been suspected to be involved in the development of certain forms of childhood cancer based on interview data. While these results have been inconsistent and not validated since the linkage is uncertain, a minimal exposure to chemical agents is warranted.

#### **Prevention Approaches Directed to the Parent**

While not firmly established, it appears that parental exposure, prior to conception, during

gestation, and during early childhood, to environmental factors, may influence the development of cancer in children. Prevention therefore should be especially directed to parents.

Smoking cessation before conception and during pregnancy as well as secondhand smoke exposure to the child should be practiced. Tobacco smoke contains numerous carcinogens that have been linked to genetic mutations and cancer and thus should be avoided throughout the life of the child.

Decreasing in exposure to radiation is a second preventative measure, either through medical tests or occupational exposure. Radiation is capable of inducing mutation in sperm and eggs as well as effecting cells in the fetus.

Exposure to pesticides, chemicals and drugs, and alcohol should be limited. Although a linkage between these factors and childhood cancer has not been established, a role for the effects of these agents in cancer induction in animal models has been established, and exposure should be controlled especially to the mother during pregnancy and during breast-feeding.

Finally, lifestyle factors besides smoking, including proper diet, reduced UV light exposure from sunlight, proper nutrition, and exercise, are important in maintaining the proper health of the adult and thus will have important influences on the sperm and egg as well as the fetus in utero. With regard to nutrition, prenatal folic acid supplementation in mothers was shown in a case control study to protect against the development of childhood brain tumors (Milne et al., 2012).

Fortification of flours with folic acid in the USA has also helped to reduce the incidence of neural tube defects (Shaw, Schaffer, Velie, Morland, & Harris, 1995).

The distribution of most common cancers in children (0–15 years of age) and young adults (15–19 years of age) in New Jersey by age is shown in Table 4. Leukemias and CNS tumors were more frequent in children, while lymphoma and bone sarcomas seemed to be expressed in higher incidence after age 15. The reason for differences in the age of onset is not known but may point to the time and age of tumor initiation. Further studies are needed to confirm these findings of a difference in age of detection and to determine causation.

**Cancer During Childhood, Table 4** Incidence of most common cancers in 0–14 year olds and 15–19 year olds, from 1990–1997 in New Jersey

Types of cancer	Number of cases per 100,000 children <15 years old	Number of cases per 100,000 children between 15 and <19 years old
All types of cancers	141.3	206.8
Acute lymphocytic leukemia	29.3	11.5
Acute myeloid leukemia	6.6	8.8
Hodgkin's lymphoma	5.7	34.7
Non-Hodgkin's lymphoma	8.5	17.1
Central nervous system tumor	31.8	20.3
Malignant bone tumors and osteogenic and Ewing's sarcoma	7.0	15.8
Rhabdomyosarcoma	5.1	3.6
Total of top 8 types of cancers	94	111.8

Modified by author, Alyce Fly, 2013 from Task Force on Cancer Prevention, Early Detection and Treatment in New Jersey, (2002)

### What Does Not Work

It is difficult to identify those approaches that do not work in preventing childhood cancer since little is known about what the agents are that induce cancer in children.

### Summary

To date the best practice for preventing childhood cancer involves preventing exposure of the child and the mother during pregnancy to carcinogenic agents and providing them with good nutrition so that the body has the resources to maintain defense mechanisms. Thus, families and professionals should work to:

- Prevent exposure of the fetus in utero to environmental insults including but not limited to smoking and alcohol consumption by the mother during pregnancy.
- Prevent exposure of children and the mother during pregnancy to radiation from medical, natural and environmental sources.

- Prevent exposure of children to secondhand smoke.
- Provide a healthy diet to the child and the mother during pregnancy, especially one that includes a variety of fruits and vegetables; these food groups are rich sources of antioxidants.
- Prevent exposure of children to carcinogens in the home environment and also from occupational contamination that people may bring into the home.

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## Child Care: Promoting Healthy Development in Children

Andrew J. Mashburn  
Department of Psychology, Portland State  
University, Portland, OR, USA

### Introduction

Upon entering kindergarten at age 5 when the formal system of schooling begins for most children in the United States, nearly every child has had some type of child care experience provided by someone other than a parent or primary guardian. These experiences may include relative care provided by another relative in the child's home or the relative's home, nanny care provided by a nonrelative in the child's home, home-based daycare provided in the home of a nonrelative, and center-based care provided in a child care center. The provision of care for young children outside of the home by someone other than the child's mother is a relatively new approach to child rearing in the United States, and it reflects a change in beliefs about the necessity of maternal care and increased opportunities for children to receive these alternative forms of care. In particular, opportunities for young children to attend publicly funded center-based programs have rapidly expanded over the past five decades as a result of the growing recognition that early intervention can promote the well-being of children, families, and communities and prevent later difficulties that many children have adapting to formal school settings.

Despite the wide range of child care that children may experience between birth and kindergarten, nearly all of what is currently known about effective child care comes from studies conducted in publicly funded centers that serve 3- or 4-year-olds who experience social and economic risks. To realize the goals of promotion and prevention that these public programs are intended to achieve, settings must be designed and structured in ways that maximize opportunities for children to learn and develop. The current

foci of research, policy, and program improvement efforts have been to understand the ecological inputs to children's development within these contexts and to provide learning opportunities that are aligned with young children's developmental needs.

### Definitions and Scope

Child care can be broadly grouped into two setting types – home-based and center-based – and the nature of children's experiences varies within each. Home-based child care may occur within the child's home, a relative's home, or a nonrelative's home; it typically includes small numbers of children of mixed ages who are cared for by a single adult; and except for home-based childcare settings that receive licensure, there are no regulations or requirements that govern these settings. In contrast, center-based programs are highly regulated and are differentiated according to the ages of children served, the funding that supports the programs, and the economic backgrounds of children served.

With regard to the ages of children served, center-based programs that are attended by 4-year-olds the year prior to kindergarten are defined exclusively as "prekindergarten" or "pre-K" programs, and they have an explicit goal of providing early learning experiences that prepare children to enter kindergarten ready to learn. Center-based programs attended by children between birth and age 3 are defined collectively as either "child care" programs or "preschool" programs. Within these centers, rooms are often separated into age categories for infants (0–12 months), wobblers (12–23 months), toddlers (24–36 months), and preschoolers (36–48 months), as a way to accommodate the different developmental needs of children and to adhere to the varying child-to-adult ratios at each age level that is required for centers to attain licensure.

The funding sources that support center-based programs also vary. Programs for infants, wobblers, and toddlers are operated by either private for-profit or private not-for-profit entities, and



they are currently not part of publicly funded state or federal programs. Preschool programs for 3-year-olds and pre-K programs may be either privately run or publicly funded, and those that are publicly funded vary in terms of the economic backgrounds of children who are eligible to attend. Within publicly funded pre-K programs, a few state programs (e.g., Georgia, Oklahoma) are “universal” and available to any 4-year-old regardless of their social and economic background. However, most public programs are “targeted” to children from socially and/or economically disadvantaged backgrounds who may be at risk of experiencing challenges adapting to later school settings. And prekindergarteners and younger children with diagnosed disabilities may receive special education services as part of the Individuals with Disabilities Education Act (IDEA). These three types of early intervention programs (universal, targeted, and IDEA) represent primary, secondary, and tertiary prevention strategies, respectively.

The prevalence of 3- and 4-year-olds who attend center-based programs has rapidly increased over the past five decades as a result of the creation of these public programs by the federal government and most states. In 1965, the federal government established Head Start to provide comprehensive services to young children and their families (Zigler & Muenchow, 1994), and since its creation, it has enrolled over 30 million children and currently serves over 900,000 children annually (Administration for Children and Families & Department of Health and Human Services, 2012). Forty states also offer public programs for 4-year-olds, and 26 states offer public programs for 3-year-olds, which together serve 1.3 million children annually (Barnett et al., 2012). In total, in 2011–2012, 15 % of 3-year-olds and 42 % of 4-year-olds attend a publicly funded preschool or pre-K program, respectively (Head Start, state, or special education). According to the National Household Education Survey in 2007, approximately 47 % of 3-year-olds and 74 % of 4-year-olds attended either a private or public center-based program (Barnett, Epstein, Friedman, Sansanelli, & Hustedt, 2009). Among 4-year-olds, this

represents a 400 % increase since 1965 in the prevalence of children who attend a pre-K center prior to enrollment in kindergarten (Barnett & Yarosz, 2004).

## Theories

Theories applied to child care that are relevant to understanding the growth and development of children within these settings are either child-focused that describe stages and processes of young children’s cognitive development (e.g., Piaget and Vygotsky) or setting-focused that identify the ecological inputs that promote developmental outcomes. For example, Piaget (1954) described the progression of stages through which children develop cognitions during the early childhood years. The first is the sensorimotor stage from birth to age 2 that involves achieving a series of milestones related to the coordination of perceptions and sensations with actions and movements. The second is the preoperational stage lasting from age 2 to age 7 during which children first begin to mentally represent objects that are not present and later begin to develop reasoning skills. Similarly, Vygotsky’s (1962) theory focuses on how children construct knowledge and understanding, with a key determinant being the opportunities afforded to the child through interactions with adults and peers. Specifically, Vygotsky describes children’s zone of proximal development (ZPD), which identifies a range of tasks that are appropriate for a young child, the upper limit of which requires the guidance and assistance of a teacher or more-skilled peer. The social nature of young children’s cognitive development described by Vygotsky has led to the identification of the specific types of interactions in child care settings that children need to experience to promote learning and development.

Bronfenbrenner and Morris’ bioecological model of development (2006) is a setting-focused theory that elaborates the ways that features of ecological settings impact development and learning. According to this theory, learning and development for individuals of any age occurs

through direct and sustained interactions with both physical objects and other individuals that are appropriate for the ability level of the individual, become increasingly complex to meet the growing demands as the individual develops, and are used regularly and for extended periods to offer continual challenges. Furthermore, Bronfenbrenner and Morris' model postulates that the impacts of these interactions on an individual's development vary systematically as a function of the environment and the person (Bronfenbrenner & Morris, 2006).

Mashburn and Pianta (2010) applied the bioecological model of development (Bronfenbrenner & Morris, 2006) to child care settings in order to articulate the mechanisms through which child care settings act to promote children's development. Specifically, within the "microsystem" of the child care setting, a child's learning and development occurs through direct interactions with physical resources (e.g., books, manipulatives, art supplies, costumes) and social interactions with peers and adults that are appropriate to the child's ability, that become increasingly complex, and that are frequently experienced over sustained periods of time – these are the "proximal processes" through which learning and development occurs within child care settings. Bronfenbrenner and Morris also hypothesized that the extent to which these proximal processes affect children's development depends upon characteristics of the child and other characteristics of the settings.

Other characteristics of the child care setting that may impact children's learning and development include characteristics of the teacher (e.g., level of education, field of training) and characteristics of the classroom (e.g., curriculum, number of children enrolled in the classroom, and teacher-to-child ratio). However, these features of the ecological settings are part of the "macrosystem," which are more distal to the developing child than the proximal processes, and they can improve children's learning and development in child care settings to the extent that they affect these proximal processes. These hypotheses about the direct impacts of physical and social resources on development, the

moderated impacts related to characteristics of the individual child, and the indirect impacts of classroom and teacher characteristics have been extensively tested in research about effective child care.

## Research

The earliest studies of child care used experimental designs to address the question "does attending a child care program impact children's short-term and long-term outcomes?" The overwhelmingly positive results from these early studies led to the creation and rapid expansion of publicly funded, center-based programs nationwide. With the large public investment in these programs, it is not surprising that the predominant focus of current child care research occurs within these settings. These studies have been conducted both to justify the expenditure of public funding to support these programs and to better understand ways to improve their effectiveness.

The primary question driving this current research agenda is: "how should settings be designed and structured to maximize their impacts on the developmental outcomes of children who attend?" Specifically, current research has sought to identify the contributions to children's development that are attributable to malleable features of child care settings, including characteristics of caregivers (e.g., level of education, field of study), characteristics of the setting (class size, child-to-teacher ratio, curriculum), quality of the physical environment (e.g., space and furnishings, learning materials), and quality of the caregivers' interactions with children (e.g., emotional support, instructional supports). Results from these studies have the potential to inform policies and program improvement efforts that create more effective learning opportunities. However, across volumes of research conducted over the past two decades, there is mixed evidence concerning the features of child care settings that have the strongest associations with different developmental outcomes and for whom.

### Setting Characteristics

*Teacher Factors.* Although there is a widely held belief that higher levels of teacher education and specialized training in child development or early childhood education contribute to the quality of child care experiences and children's learning and development, this result has not been found in recent studies involving contemporary pre-K programs. For example, using data from seven large-scale evaluations of programs that included over 7,500 children enrolled in nearly 3,000 preschool classrooms, Early and colleagues (2007) found that teachers' level of education and field of study were not significantly associated with the quality of children's experiences in classrooms. Similarly, in a recent study that included nearly 700 state-funded pre-K classrooms in 11 states, Mashburn and colleagues (2008) found that teachers' level of education and field of study were not associated with children's development of academic, language, or literacy skills during the school year.

*Physical Environment.* Class size and child-to-teacher ratio are also commonly included in studies to identify features of impactful pre-K programs, and again, recent research has found that pre-K programs that adhered to recommended maximum standards for class sizes (20 children or fewer) and minimum standards for child-to-teacher ratio (10 to 1 or lower) did not produce greater rates of development for children who attended (Mashburn et al., 2008). Similarly, the type of curriculum used in child care settings has also been a focus of study, with the hypothesis that some curricula may better structure learning activities in ways that ensure children are given ongoing and systematic opportunities to develop the early skills that are critical for later school success. However, the evidence base on the precise effects of curricula on children's development is mixed, with results that vary from study to study (Preschool Curriculum Evaluation Research Consortium, 2008).

Recent studies commonly use observational methods to assess the quality of the physical environment (e.g., space, furnishings, and learning materials) and social interactions (e.g., nature of classroom activities and the emotional and

instructional interactions between teachers and children) to examine their associations with children's learning. Across this vast literature, there is general support that higher-quality preschool environments are positively associated with children's development (e.g., Lamb & Ahnert, 2006; Mashburn et al., 2008; NICHD Early Child Care Research Network, 1999, 2002). However, there are at least four caveats to these results. Across studies, associations between quality and outcomes tend to be small and, in some studies, nonsignificant (NICHD Early Child Care Research Network & Duncan, 2003). The correlational nature of these studies may reduce the validity of the results. The quality of the social interactions tends to have stronger positive associations with children's development than the quality of the physical environment (e.g., Mashburn, 2008). And the associations between quality and outcomes tend to be stronger for children who experience social and economic risks (e.g., Mashburn, 2008; Peisner-Feinberg & Burchinal, 1997).

In sum, the general findings across 20 years of research to identify the features of child care programs, and more specifically pre-K programs, that contribute to children's development present a complicated story about which features of these settings influence which developmental outcomes and for whom. However, taken generally, these results confirm a number of postulates from Bronfenbrenner's bioecological model (Bronfenbrenner & Morris, 2006). Specifically, the quality of physical resources and teachers' interactions with children are the proximal processes that promote development and have been found to be directly associated with children's learning; the associations between the quality of the physical and social environment on children's development depend upon characteristics of the child, with children who experience social and economic risks tending to benefit most from higher-quality settings; and characteristics of teachers and classrooms are not directly associated with children's learning and development, but they may indirectly affect these outcomes to the extent that they affect these proximal processes. The direction for future research in child care settings

should be twofold: to better articulate the specific features of the settings that are positively associated with specific developmental outcomes, and for whom, and to move beyond center-based pre-K settings to address these research questions about how to design and structure learning opportunities among the entire range of settings within which children experience child care.

## Strategies

There are at least four general types of improvement strategies that are common within child care settings: (1) policy approaches, (2) curricular strategies, (3) Quality Rating and Improvement Systems, and (4) teacher training and professional development.

### Policy Approaches

Policy changes enacted by entities that operate and regulate public and private programs are a common trigger for improving the quality of children's experiences within center-based child care settings. Features of programs that are affected by policies include the maximum class size, minimum child-to-teacher ratio, requirements for the number of hours that teachers participate in professional development activities, requirements for the minimum levels of teacher education, and requirements for teachers' specific field of study.

The policy question that currently receives the most attention by state programs and Head Start is whether to require that teachers have at least a bachelor's degree, as many public programs allow lead teachers to have an associate's degree. Although prior research about teachers' level of education questions the merits of this potentially costly policy on improving children's experiences (Early et al., 2007) and learning outcomes (Mashburn et al., 2008), advocates of this mandate consider among its potential benefits the increased "professionalization" of the field of early childhood education (Bellm & Whitebook, 2003) and better integration of pre-K teachers into the K-12 system of education (Bogard & Takanishi, 2005).

### Curricular Strategies

The second improvement strategy is the adoption of a comprehensive curriculum that structures the learning activities within a given day or adoption of a supplemental curriculum that focuses small parts of the day on activities that build specific competencies such as social-emotional (e.g., Greenberg, Kusche, & Riggs, 2004) or language and literacy (e.g., Justice, McGinty, Cabell, Knighton, & Huffman, 2010).

### Quality Rating and Improvement Systems

The third strategy to improve child care experiences that is becoming increasingly popular is participation in a Quality Rating and Improvement System (QRIS) (Zellman & Perlman, 2008). A QRIS typically has three components. First, the quality of a participating child care setting is rated using standardized observational protocols that assess the quality of the environment, including the physical setting, social interactions, number of children, and child-to-adult ratio. Next, the setting is provided resources to address the identified needs. Finally, the quality of the setting is reassessed to document improvements, and the final level of quality is communicated publicly, often through the assignment of stars denoting the level of quality of the setting.

The intention of communicating these ratings is to influence parents' decisions to choose higher-rated settings and to compel child care settings to participate in the quality enhancement activities. In 2008, over 26 states had implemented a statewide QRIS and at least 20 additional states were in the process of developing a QRIS (Zellman & Perlman, 2008), most of which involve center-based settings. Some states were in the process of piloting this approach to improve the quality of children's experiences in home-based settings.

### Teacher Training and Professional Development

The fourth strategy that is also growing in popularity in both home-based and center-based child care settings is the adoption of teacher professional development programs that involve

coaching and mentorship strategies to improve the ways that adults interact with children. Early approaches to professional development for caregivers and teachers involved day-long workshops conducted outside of the caregiving environment and used didactic instructional methods, and the effectiveness of this approach is dubious. New strategies involving coaching and mentoring are derived from the adult-learning literature (Richardson & Anders, 2005) that indicates that effective strategies to improve knowledge and skill should be active, collaborative, ongoing, and linked to the caregiving context. These approaches using coaching and mentorship are being developed, implemented, and tested in centers (e.g., Bierman et al., 2008; Chesebrough & King, 2004; Pianta, Mashburn, Downer, Hamre, & Justice, 2008) as well as home-based child care environments (e.g., Koh & Neuman, 2009).

## What Works

There is unequivocal evidence that attending a high-quality, small-scale (model) child care program that focuses on improving a comprehensive set of developmental outcomes confers short-term and long-term benefits for children. This evidence comes from three landmark experimental studies that began in the 1960s or 1970s and tracked the developmental outcomes of participants and nonparticipants into adulthood. The first is a longitudinal study of the Perry Preschool program in Ypsilanti, Michigan, that began in 1962, and results found that children who attended had improved social and economic outcomes at age 40 (e.g., greater earnings, more likely to graduate from high school, fewer arrests) compared to their counterparts who did not attend (Schweinhart et al., 2005). The experimental study of the Chicago Parent Child program that began in 1967 similarly found that children who attended this program were more likely to graduate high school and less likely to receive special education services, be retained in a grade, or be arrested (Reynolds et al., 2007). The study of the Abecedarian program in Chapel Hill, North Carolina, began in 1972,

and by age 21, children who attended the program were more likely to be employed, enrolled in higher education, and have a skilled job than children who were randomly assigned to the control group (Campbell & Ramey, 1994).

The benefit-cost ratios derived from these studies provide extraordinarily powerful evidence of the impacts of high-quality early intervention programs – with estimates ranging from approximately \$3–13 returned for every one dollar invested in these programs (e.g., Lynch, 2010). Although the arguments to provide public programs for young children who experience social and economic disadvantages are often made on moral grounds, it is the economic benefits of early intervention programs derived from these three experimental studies that fueled policy decisions by the federal government and most states to create and expand programs over the past five decades.

Experimental studies that test effects of contemporary child care programs (e.g., the Head Start Impact Study) have produced estimates of program impacts that are smaller than those found in earlier studies (Puma et al., 2010), due in part to differences in the composition of the comparison groups then and now. As a result of the dramatic increase in the prevalence of children who attend public programs, the comparison group in current studies comprises children who likely attended a program other than the one under investigation, while in earlier studies, the comparison group comprised children who likely did not attend a program at all. To estimate impacts of attending versus not attending in contemporary programs, alternative methodologies such as regression discontinuity have been used, which capitalize on the age cutoffs for enrolling children into programs. This method assesses program impacts by comparing the developmental outcomes of children who were just above the age threshold and eligible to attend the program with children who were just below the age threshold and not eligible to attend. Results from these studies also provide evidence that attending these programs produces large short-term benefits for children (e.g., Gormley, Gayer, Phillips, & Dawson, 2005).

## What Is Promising

There are at least three approaches that hold promise in improving the effectiveness of child care in home-based and center-based programs: (1) comprehensive and supplemental curricula, (2) Quality Rating and Improvement Systems (QRISs), and (3) teacher training and professional development involving coaching and mentoring. There is a mixture of scientific evidence for the efficacy of these approaches from studies within center-based child care settings, as well as theoretical support for the soundness of each method within home-based settings.

### Comprehensive and Supplemental Curricula

The theoretical justifications for the benefits of adopting a comprehensive curriculum are that the curriculum provides a scope and sequence for learning activities that promote development, and the activities target a comprehensive set of developmental outcomes, including literacy, language, social-emotional, math, and motor skills. The scientific study of the effectiveness of curricula in public, center-based child care settings was advanced by the Preschool Curriculum Evaluation Research (PCER) initiative that was funded by the U.S. Department of Education (Preschool Curriculum Evaluation Research Consortium, 2008). In 2002 and 2003, the effectiveness of 14 preschool curricula was evaluated in separate experimental trials in which center-based classrooms serving 3-, 4-, and/or 5-year-olds were randomly assigned to either adopt the curriculum under study or to continue using an existing curriculum. The impact of a given curriculum on children's learning was assessed by comparing developmental outcomes at the end of the school year for children in the treatment and comparison settings. Results indicate that across the 14 trials, there were virtually no statistically significant impacts attributed to any given curriculum – only one had any detectable effect on literacy outcomes, two had detectable effects on mathematics outcomes, and none had effects on children's social outcomes (Preschool Curriculum Evaluation Research Consortium, 2008).

However, closer review of these results indicates that the effect sizes achieved by many curricula were educationally meaningful, and the lack of statistically significant differences was due to the small numbers of settings included in each experimental study (most trials had a total of 14 settings participate).

Another promising avenue for improving children's experiences in child care settings is the adoption of curricular supplements. In contrast to adopting a comprehensive curriculum that requires a complete overhaul of the activities during a day, curricular supplements involve activities that target a very specific developmental domain, take very little time during the day to implement, and require minimal training for the implementer. For example, Read it Again! is a supplemental language and literacy program in which teachers read a book to children twice per week and provide explicit instruction to promote vocabulary, narrative, phonological awareness and print knowledge, and quasi-experimental studies find some promise of this approach in promoting early language and literacy skills (e.g., Justice et al., 2010). Promoting Alternative Thinking Strategies (PATHS) involves story books, puppets, and other materials that are used in lessons to improve children's self-control and social competence, and evidence from experimental trials find support for this approach (e.g., Domitrovich, Cortes, & Greenberg, 2007; Greenberg et al., 2004). Banking Time involves a series of one-on-one, child-led interactions with a caregiver that are designed to strengthen the teacher-child relationship, and results from an experimental test also find benefits of this approach (Driscoll & Pianta, 2010). The minimal training required, relatively low cost, and encouraging results of these curricular supplements make them particularly promising methods for use in home-based child care settings.

### Quality Rating and Improvement Systems

Quality Rating and Improvement Systems (QRISs) are another promising approach to improve children's experiences in child care settings, and they have been widely adopted by



states as a way to initiate quality improvement activities in child care settings. The promise of this approach is based on the theoretical premise that quality improvement activities that address the specific needs of a setting will improve these settings (and, to a lesser degree, the developmental outcomes of children within these settings); however, empirical studies that test the effectiveness of this approach are scant. There are a number of evaluations of the validity of states' QRIS quality standards and studies describing quality improvements before and after participating in a QRIS; however, there are no published results to date from experimental studies of the impacts of a state's QRIS on setting quality or children's development.

Most QRISs also communicate the quality of each participating center by assigning a star rating, in order to affect parents' choices about where to send their children and to influence child care settings to participate in the quality enhancement activities. However, it remains questionable that this component of the QRIS is effective. In fact, published star ratings may compel centers with the lowest quality (and greatest need for support) to avoid participating in these programs altogether, which is a major limitation with this approach. Another limitation with the QRIS is its potential applicability to home-based care settings. Although, some states are in the process of piloting home-based QRIS programs, little is known about whether implementation of quality improvement activities and communication of the quality of these settings is a feasible approach to improve quality in these settings.

### **Teacher Training and Professional Development Involving Coaching and Mentoring**

The third promising approach to improving children's experiences in child care settings is through professional development programs that use coaching and mentoring strategies. There is evidence from recently conducted rigorous studies showing these programs can improve the quality of interactions and children's development in center-based and home-based settings. For instance, using a multiple baseline design,

12 child care providers in center-based programs who participated in the coaching-based Teacher-Child Interaction Training program had significant gains in their positive interactions with children (Lyon et al., 2009). Similarly, in an experimental study of the MyTeachingPartner professional development program in a state-funded pre-K program, teachers who worked with a consultant to build knowledge and skills related to effective classroom interactions had significantly greater improvements in the quality of their classroom interactions than teachers who did not participate (Pianta et al., 2008). And children in classrooms with teachers that participated in the consultation made significantly greater gains in receptive vocabulary skills than children in classroom with teachers who did not participate (Mashburn, Downer, Hamre, Justice, & Pianta, 2010). There is also evidence of the efficacy of coaching-based approaches in home-based settings. Koh and Neuman (2009) found that home-based daycare providers who participated in a language and literacy course and received coaching had greater improvements in their literacy practices than providers who only took the course or who had neither the course nor the coaching.

### **What Does Not Work**

A search of the research literature did not uncover any strategies that consistently did not work, which may be due in part to the bias in publishing research with null findings.

### **Summary**

Prior to enrolling in kindergarten, nearly every child has received care by someone other than a parent or primary guardian in a setting other than the child's home. Among the wide range of settings within which children receive child care, publicly funded centers for 3- and 4-year-olds have served as the proving grounds for developing new knowledge about the ecological inputs to children's development and for creating new

strategies that facilitate children's acquisition of skills and competencies that prepare them to enter school ready to learn. Specifically, the current understanding about children's development in these learning contexts, derived from theories put forth by Vygotsky and Bronfenbrenner, is that children acquire knowledge and skills through frequent and sustained interactions with learning materials, adults, and peers that are appropriate for the ability of the child and that gain in complexity as the child develops. And, based on this understanding of children's development, the most promising strategies for improving the impacts of child care are those that affect children's interactions, which include curricula and curricular supplements, Quality Rating and Improvement Systems, and professional development focused on improving adults' social interaction with children. Despite the knowledge developed and innovations created to improve the impacts of center-based child care, little is known about the appropriateness and feasibility of implementing these and other strategies within the wide range of home-based and center-based child care contexts that children experience from birth until kindergarten. Future work is needed to identify usable strategies that improve the proximal processes that children experience within all of these developmental contexts.

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## Creativity in Early Childhood

Frank R. Lilly  
California State University, Sacramento,  
Sacramento, CA, USA

### Introduction

In a world that is changing dramatically, globally, environmentally, technologically, and economically, there is a great need to do our best to prepare our children to be able to adapt to a world we cannot predict. Specifically, many of the careers young children will eventually choose on exiting school have not been invented yet. What subjects are most important to teach is often the emphasis of current national and state educational standards. However, the subjects may not be the most important thing that needs to be taught. For young children to adapt, they need to be able to critically analyze and evaluate their surroundings, their options, and their consequences. To be able to critically think, students need to be encouraged to be creative and look for multiple solutions to problems they are presented with. Creativity has not always been associated with problem solving, critical thinking, or problem finding. Yet today, educators are beginning to understand that unless we teach children to think and to enjoy solving problems, there will be repercussions that will leave many unprepared to enter a workforce that demands highly skilled workers.

Over the past 62 years, the study of creativity has been valued as a research interest. Before this time, few were interested in studying creativity. The zeitgeist of psychological research during the late nineteenth and early twentieth centuries focused more on concrete observable behaviors such as learning and perception. Not until the cognitive revolution did creativity become a construct worthy of study. Yet today, the

study of creativity is well established in educational and psychological research (Reilly, Lilly, Bramwell, & Kronish, 2011). The need to understand creativity is evidenced by the ever-changing dynamics of the technological age (Lau, 2006; Prentice, 2000) and our need as humans to adapt to our environment. Genuinely creative adaptation represents the only possibility that humans can keep abreast of an evolving world (Rogers, 1954). Therefore, creativity should be cultivated in young children, particularly in an educational environment (Saracho, 2012; Starko, 1995). Yet, are young children capable of being creative? If so, in what ways are they creative? Is their creativity innate or learned? If learned, in what ways can we help to improve young children's abilities to be creative? This article discusses where, how, and when young children are creative, what promotes childhood creativity, and what constrains it. The theoretical focus is developmental, including biological, psychological, and societal systems that influence and impede creativity.

### Definitions and Scope: What Is Creativity?

Creativity has often been interpreted by society as synonymous with artistic expression (Eckhoff, 2011; Prentice, 2000; Saracho, 2012). Creativity has also been interpreted as the product of highly intelligent individuals. Similarly, other researchers have viewed creativity as an inherent characteristic only few possess and only to be studied retrospectively in famous individuals. And although research has suggested correlations with both the arts and intelligence, creativity as a construct has been agreed upon to be something unique or novel that had external value, the result of purposeful behavior, and a result of sustained duration (Csikszentmihalyi, 1996; Gardner, 1993; Gruber & Wallace, 1999; Reilly et al., 2011). This definition has often been used to evaluate the products of artists, scientists, economists, authors, and others. Yet Taylor (1975) and others have stressed that to understand the perceptual and motivational hypotheses underlying creative acts,

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we must consider the person creating in the environment, emphasizing the importance of the creator's dispositional style and goodness of fit with the domain and field. Therefore, we must study the person, the process, the product and the press of creativity in order to more fully understand the scope of creative behavior.

Creativity has been demonstrated as a sense of curiosity and wonder, inventiveness, flexibility, exploratory behavior, imagination, and originality. Creative individuals have developed a capacity to take risks, to tolerate ambiguity, and to possess openness to experience and a freshness of perception (Lilly & Bramwell-Rejskind, 2004). Creativity has been correlated with intelligence, and a vast amount of research on multiple intelligences has provided further evidence that creativity can take many forms. For example, Gardner (1993) states that intelligence can be expressed through the traditional outlets of logical spatial and linguistic expression, yet can also be expressed kinesthetically, intrapersonally, interpersonally, naturalistically, existentially, musically, and visiospatially. Multiple intelligences suggest there are multiple ways individuals can creatively learn and express solutions to novel situations.

Recently, "everyday" creativity (i.e., creativity that can be observed in humans and other animals in a variety of settings) has been the focus of great research. This research focuses on how traditionally average individuals can be viewed as creative based on how they recombine symbols, systems, and constructs in their everyday lives. As such, children are prime examples of taking recently learned concepts and applying them in novel ways (i.e., the product is novel to the child) (Starko, 1995). This has been instrumental in an argument to reintroduce creativity into the curriculum and instruction of our public schools. It is crucial for children to learn and then exhibit creativity in their future learning lives. Creativity must be included in education in order for children to practice imaginative and inventive ways of thinking and doing (Prentice, 2000).

Young children represent the purest forms of everyday creativity as they explore their environment. Children use all their senses to explore the objects and events they experience. All

experiences add to the young child's repertoire of behavioral possibilities. Observing young children as they recombine shapes, blocks, and toys in novel ways can be inspiring as they smile and wiggle with delight at their accomplishments. Or observing the intricacies with which children develop imaginary encounters demonstrates how unencumbered their ideas can be. With this unencumbered freedom to create comes the social construct of appropriateness. Parents and family, teachers, and peers all contribute to the social learning of children to fit in and be part of the group. At a very young age children are being taught what is creative and what is not.

## Theories

Learning to be creative has been studied from a learning perspective, a cognitive perspective, a humanist perspective, and an evolutionary perspective. Early theories of learning were often based on contiguity theory, also called associationist/connectivist or behaviorist perspectives. Here the learner is viewed as a passive absorber of stimuli controlled by prior stimuli (Ormrod, 2009). More contemporary learning theories view learning as a goal-oriented process. Learning as a goal-oriented process makes learning purposeful. Tying information to prior knowledge, understanding, and affect makes it meaningful. Learning ties made by each student are original and, if goal oriented, are appropriate to meet the goal, then the processes of learning themselves can be considered creative (Starko, 1995).

Learning and problem solving became associated with the study of creativity as cognitive approaches to research became more prevalent. First, approaches viewed the learner as needing to locate a difficulty, then the difficulty is defined, then possible solutions are considered, then consequences are weighed, and finally one of the solutions is accepted. Later, the creative problem solving process was viewed as, first, involving preparation, then incubation, then illumination, then verification. Later theoretical models of the creative problem solving process were also made up of logical steps resembling



the scientific method (i.e., sensing a problem, making hypotheses about the problem, evaluating the hypotheses, and communicating the results). However, the Parnes/Osborn model of Creative Problem Solving (CPS) was different in that it contained three components (i.e., understanding the problem, generating ideas, and planning for action). These components are implemented in six stages (i.e., mess finding, data finding, problem finding, idea finding, solution finding, and acceptance finding). More recent cognitive approaches take on a more technological terminology and include analyses of retrieval, synthesis, transformation, analogical transfer, and categorical reduction of mental processes (Sternberg, 1999).

A more confluent approach hypothesizes that multiple components must converge for creativity to occur. The systems approach includes the domain, the field, and the individual. Profiles emerging out of this research suggest creative individuals possess somewhat contradictory characteristics. Csikszentmihalyi (1990) describes this phenomenon as complexity of personality experienced through the concept of “flow.” Flow states are enjoyable experiences whereby the individual “loses themselves” in an activity. The activity is believed to be characterized by clear goals, immediate feedback to one’s actions, a balance between challenges and skills, action and awareness merge, distractions being excluded from consciousness, having no worry of failure, self-consciousness disappearance, the sense of time becoming distorted, and the activity becoming autotelic (i.e., doing the activity for its own sake).

Current research views creativity from a positive psychology perspective. Instead of studying behaviors and characteristics of humans involving maladies, or a select population of intelligence, positive psychology views creativity as something all humans possess to varying degrees and something that can be nurtured and developed (Linley, Harrington, & Garcea, 2010). The lens of positive psychology focuses on the positive aspects of human behaviors. This perspective focuses on how we can increase our understanding of authenticity, abundance,

optimism, appreciative inquiry, social responsibility, commitment, leadership, and resilience. Researchers in positive psychology suggest that when we identify our strengths, we feel better about ourselves and those around us. When we feel better about ourselves, we develop the competence (ability to learn) and the commitment (willingness to learn). Students who are competent to learn but not willing to learn will not perform to their full potential and thus not demonstrate creative behavior. Commitment emerges from building an individual value position that engages students to use their energy to pursue the institutional goals.

Therefore, when schools need to develop strategies to address curriculum and instruction or teacher commitment, organizational development (OD) needs to occur. Appreciative Inquiry (AI) is a creative process of discovery (an issue or perceived problem), dream (about possible solutions), design (implement a strategy), and destiny (creating the ideal solution) to address problem solving. This OD model teaches teachers, administrators, and employees to value the most positive setting possible. To use this model successfully to conduct system change, the field of demographics studies what engages each generation to commit to their full potential and what affects how they define fulfillment at school. With scarce resources in education and industry, many schools are becoming socially responsible, concerned about their carbon footprint, philanthropy, and core values. As the nature of school and work become more complex, often individuals work together in teams. High-performing teams operate with the ability to learn, clear purposes, good governance, and positive member relationships (in work and school settings). This leads to more happiness in school settings, family and community settings, and career settings. Therefore, the positive psychology approach studies how to achieve abundance in multiple settings (Linley et al., 2010; Lopez & Snyder, 2009). Positive psychology offers a new theoretical perspective for the study of creativity in children by working to increase potential in the child, the parent, the teacher, the administrator, and the school district.



## Research

### Creative Potential

According to Vygotsky, every human being is equipped with a potential for creativity (Ormrod, 2009). Children can be creative on a small personal scale relevant to their environment defined as “little c,” while the potential for “big C” (i.e., creativity on a grand scale) later in their development can be fostered and enhanced through the collaboration of parents and educators. Some theorists believe expertise is a precursor to creativity, yet experience has also been known to inhibit creativity when associated with inflexibility. Children’s lack of expertise allows them to perform creatively without being constrained to conventions and norms; however, at the same time it may keep them from making original assumptions. Those attributed with creative minds such as Piaget, Freud, and Darwin moved from studying one field to another bringing new perspectives and avoiding assumptions. In the same way, children do not have the experience to develop the same assumptions thus avoiding routines, making it easier for them to reach original ideas. One study found age to be crucial to the creative process because it affects children’s cognitive, motor, and social developments. For example, in order to estimate motor creativity through the evaluation of divergent movement ability in preschool and elementary school children, older children display a higher level of motor creativity, implying that previous knowledge and experience enhances creativity (Zachopoulou & Makri, 2005). And although young children are often creative relative to themselves, in order to promote general creativity, a greater knowledge base is required (Sternberg, 2003). Therefore, until children receive the basic skills training needed to create something truly novel and display “big C,” then creativity research should emphasize promoting the creative process rather than the product in this developmental period.

### Process Versus Product

Drawing, an activity that includes both the process and product, has become a topic for

discussion in early childhood programs, as some question the value of the activity. Drawing is a catalyst of thoughts that allows the child to create something new from previously learned themes through the direct manipulation of art materials (Faulkner, Coates, Craft, & Duffy, 2006). According to Wright (2010), in *Understanding Creativity in Early Childhood*, emphasis should be placed on promoting creativity in children by signifying the creative process of drawing rather than the end product. To dispel some of the misconceptions surrounding drawing as a “lesser practice,” 100 children between the ages 5 and 8 were studied to understand the significance of the drawing process at an early age as a vehicle for creative thought and expression. Similarly, Del Nero (2011) views drawing as a “sign-making” process that connects the child’s external real world with his/her inner imagination. Both support the idea that art is a tool for creative expression in children and stress for the continuance of art programs in early childhood education. When arguing process versus product, productivity may not always be a good indicator of creativity in young children as the characteristics of creativity must be evaluated in context to the child’s experience (Runco, 1999). When engaging in original ideas for themselves rather than a given domain or field, young students need to develop the meta-cognition and self-regulation to continuously focus on their creative process (i.e., creating and generating original ideas) which once acknowledged motivates them to generate more ideas (Saracho, 2012). However, children’s lack of expertise may limit their ability to perform creativity, yet at the same time it is this lack of experience that allows them to disregard assumptions and express more openness and originality (Runco, 1999). When young children seem uncreative, they are simply unable to express their insights. Therefore, it is essential to create this opportunity. Parents and educators are recommended to make sure children do not lose their capacity to be spontaneous and flexible and encourage children to be strategically creative by promoting originality in children while allowing them to learn important conventions (Runco).

## Parenting

Carl Roger's Humanistic Theory (1954) explaining psychological safety and freedom is paramount according to Harrington, Block and Block (1987). Their study focused on child-rearing practices that may promote the development of such factors. The Child-Rearing Practices Report (CRPR) was formed through descriptions provided by parents, which were later organized using Roger's description of a creative-fostering environment. Items in the CRPR consisted of "My child and I have warm, intimate times together" and "I encourage my child to be curious, to explore and question things." The study confirmed that children will develop a higher creative potential if raised by parents who promote psychological safety and freedom in their child-rearing practices (Harrington et al., 1987). Kemple and Nissenberg (2000) discuss the various ways in which family life can affect children's creativity, promoting a closer relationship between educators and parents in order to foster a better environment for the development of children's creativity.

## Families and Enriched Environments

Parents can promote creativity by maintaining an enriched home environment for children. Enriched environments are filled with books, toys, games, and multitudes of other intellectually stimulating resources. This also includes child-centered families in which parents spend a vast amount of time, energy, and resources on developing their children's interest and enriching their experiences by holding serious discussions with them and taking them to interesting places such as museums, zoos, and theaters (Kohanyi, 2011). Research suggests that an authoritative style of parenting characterized by the presence of both boundaries and flexibility is most common among creative achievers' parents. These parents also tend to be financially and culturally privileged allowing for a broader spectrum of resources and experiences available to the potentially creative child. While parents of high social economic status (SES) and education level can provide for these privileges to foster the creative potential in their children, it does not

predispose one to become creative (Kohanyi). In fact, research suggests creative children are likely to experience more tribulations than their equally bright but less creative peers. However, stress alone is not conducive to creativity; stress accompanied with support in the form of attentive siblings, relatives, or friends, if not parents, is the more likely contributor suggesting a balance between challenge and support is best for the development of creativity (Kohanyi).

## Mentor as Creative Facilitator

Prentice (2000) explains that in order for creativity to flourish in young children, support from creative adults is crucial. Creative mentors can help children acquire the appropriate technical skills and secure a knowledge base in order to underpin sustained creative activity. Once this is achieved, children are able to engage in a given activity with greater depth and thereby allow creativity to function. The mentor becomes the "child's instrument" in such creative episodes as storytelling where an adult takes dictation for a child who cannot write their own stories (Doyle, 2003).

## Imagination

Schaefer (1969) found implications in his study to suggest that brighter children who are inclined towards creativity were more likely to have experienced imaginary companions in childhood. Therefore, imaginary companions should be noticed as a marker of potential creativity.

## Classroom Environment

Children must feel psychologically safe and free in order to develop a creative potential demonstrated through creativity in adolescence (Harrington et al., 1987). It is important that teachers prepare their students to choose environments that are conducive to their creative success in order to nurture their development (Sternberg, 2003). Stressful environments create emotional and psychological needs in children which they try to fulfill through high levels of creativity. Students will produce higher levels of creativity and show deeper learning through the use of Universal Design for Learning (UDL).

Because students learn in a variety of ways, they need to be able to express their creativity and learning through multiple modes of representation. When given assignments or homework, students are allowed to express themselves through multiple formats to provide responses to the teacher (e.g., film, essay, skit, poetry, formula). However, first, teachers must be skilled in providing multiple modes of instruction in their classrooms and willing to accept multiple methods of evaluation for an assignment. Based on the concept of inclusion, UDL builds community in the classroom by honoring diversity. All curriculum and instruction is offered in multiple modes (e.g., lecture, film, cooperative learning, inquiry learning, discovery learning). All materials used in the classroom must be accessible to all children and complement their learning styles. As a result, students learn to explore, risk, tolerate ambiguity, generate multiple solutions to problems, and work together to solve tasks (Burgstahler & Cory, 2008).

### **Strategies: How to Promote Creativity**

As models, nurturers, and resources of children's creativity, parents and educators help facilitate creative potential by respecting and encouraging elements that are conducive to the development of creativity in their homes and classrooms. Young children that are exposed to more examples of art, mathematics, history, language, physical education, science, music, and nature will develop the knowledge base to be able to recombine ideas within any domain to produce novel and appropriate products. Although there are domains with only one correct answer to a question, most domains allow for multiple interpretations, and therefore, students need to learn to defend why they have made specific responses to questions, thus teaching critical thinking at an early age.

To nurture children's creativity in the home, parents need to work with all members of the family to discuss egalitarian and equitable exchanges of ideas and behaviors. Although

some children do learn to be highly creative within restrictive environments, most children learn best with support and guidance. Using AI as a strategy of finding the strengths in every family member and highlighting them without focusing on the weaknesses of family members will enforce positive behavior and attitudes such as respect, trust, and love. Support from loved ones helps children to be resilient and persevering. Both of these traits are necessary to promote creative behavior.

The creative educator is critical in the development of childhood creativity. Teachers must understand multiculturalism, gender and gender identity, and psychological, cognitive, and physical developments to be able to recognize the incredible variability and ability within each classroom. With that variability, responsibility to reach each child where they are is every teacher's challenge. In addition to the teacher, the classroom culture influences the curriculum and prepares children for future creativity by promoting questioning and risk taking, creative assessments, curiosity and open-endedness, collaboration and teamwork, and activities that highlight children's creative potential such as storytelling and dramatic play. The creativity of the educator is highly correlated with student creativity. The creative teacher welcomes parents into their classrooms, encourages friendships, polices bullying and discrimination, and designs cross-curricular lesson plans that not only meet standards but are exciting and fun. Creative instructors are more likely to model and encourage creativity in their students.

Further strategies for increasing childhood creativity focus on extracurricular activities. Often, teachers are not able to devote ample time for young children to learn to play a musical instrument and develop physical agility and strength through dance or athletics. As children are exposed to activities that they are curious and interested in, they develop perseverance to develop skill and confidence in an activity. The ability to transfer skills of success increases the probability that the child will be creative in the future.

## What Works

Creativity has been a research topic of interest for the past 60 years, yet no intervention or methodology has been replicated over three times.

## What Is Promising

### Creative Instructors

The more parents and teachers know about creativity and how to model it, the more they can promote creativity regardless of domain. Creative teaching is improvisational yet intentional (Bramwell, Reilly, Lilly, Kronish, & Chennabathni, 2011; Sawyer, 2003). In a study assessing the effect of creative movements during children's daily physical education on children's overall creativity, results suggest creative movement alone was insufficient in promoting creativity, and the need for a creative instructor to help develop this process among children is crucial (Cheung, 2010). Instructors initially encouraged children to learn a basic movement skill, then provided them with the opportunity to use the skill in creative ways as a means of communication and self-expression; however, without the mentors' creative guidance, many children result to imitation (Cheung). Therefore, the creative instructor becomes a crucial component in the promotion of early childhood creativity. The creative teacher has high levels of physical energy, is of above average intelligence, has a playful sense of humor, and is passionate about their interests. They appear curious, independent, complex, artistic, and open-minded with a deep motivation and drive to teach and a strong intuitive nature (Lilly & Bramwell-Rejskind, 2004).

Similar results were discovered with regard to promoting children's musical creativity. In a study exploring the (1999–2000) curriculum change in Hong Kong, Lau (2006) discovered the significant role of educators in early childhood education of creativity. Focusing on musical creativity in three case studies of Hong Kong kindergarten classrooms, fostering creativity was dependent on the understanding of the teacher of the four key areas of creativity (the environment

or press, person, process, and product). Lau also emphasized teachers/parents setting children's creativity free when engaging in creative activities rather than directing, rehearsing, or controlling performance. Lau (2010) proposed three suggestions for educators looking to enhance the musical and overall creativity in children: make room for play, provide time and environments rich with resources, and scaffold children's musical play. Similarly, an additional ethnographic study of two kindergartens in China supports the idea that the development of creativity depends on teachers' interpretations of cognition, the relationship between culture and cognition and cultural interpretation of creativity (Ang, Waite, Gooch, Brooker, & Montgomery, 2009).

Teachers can reinforce young children's potential creativity by encouraging their belief in their ability to succeed (Sternberg, 2003). The most creative individuals are those who are intrinsically motivated, and their ability to imagine success while doing work that they love will help foster that creativity. Teachers can do this by asking children to demonstrate a special talent or ability for the class and explain it doesn't matter what they do (within reason), only that they love the activity (Sternberg). Recognizing the myths surrounding creativity is also an important step for instructors in acknowledging that all students have the capacity for creativity. Also, teachers need to be self-aware and take a careful look at the curriculum and personal preference for certain intellectual styles so they do not constrain creative potentials in children (Plucker, Waitman, & Hartley, 2011).

### Creative Curriculum

In a study exploring whether play is mutually exclusive with learning, Samuelsson and Carlsson (2008) suggest a curriculum for early childhood education that does not distinguish between learning and play in order to promote creativity for future generations. While children blend the two when they act, they distinguish them in their speech. The idea here is to foster the experience of learning as joyful and related to play in order to encourage and enhance processes such as creativity in the future. Creativity is an aspect of all

learning in preschool; therefore, a close connection (association) between learning and play will foster this process.

The results of a longitudinal cultural study of children's drawings found that intentional teaching (structured lessons) at an early age can help children display higher levels of creativity because of the development of their representational skills that allows them to be creative. Thus, creativity might be enhanced by the incorporation of intentional teaching in early childhood education in order to promote the developmental skills in young children that would give them the opportunity to express their creative ideas (Huntsinger, Jose, Krieg, & Luo, 2011).

On the other hand, Dababneh, Ihmeideh and Al-Omari (2010) found a need for improvement within teachers' classroom practices that focus on knowledge retention rather than children's creative abilities. They concluded that Jordanian teachers need more training on how to prepare creative lesson plans in the form of preservice training courses for developing creativity in children. The aim of the study was to create an awareness and motivation in teachers to pursue novel approaches in fostering creativity in children.

### Preparing for Future Creativity

Sternberg (2003) states creative thinking is characterized as "buying low and selling high" which leads to defying the crowd. In this process it is easy for children to lose sight of their motivation to endure the creative process that may take a long while before it is valued. Therefore, it is the parents' and teachers' responsibility to help prepare children for these obstacles by introducing them to stories about creative individuals who were not supported in the early stages of their development. Supporting children's efforts to "surmount an obstacle" should also be praised whether they were entirely successful or not and spotlight the correlation between creativity and resilience.

Educators and parents **must** allow room for children to make mistakes and discuss those mistakes in order to realize that creativity results from a new way of thinking that formed after

collaborators took risks and made mistakes. Children in social situations such as school often experience the negative ramifications of being an independent risk taker. Often children that think, act, and look different are disenfranchised and may learn to avoid social disapproval. Educators and parents may promote creativity in young children by inspiring their children to define and redefine problems and projects. For instance, providing children with a choice between two projects is not as beneficial as allowing children to decide on a project of their own making. This gives children the ability to develop taste and good judgment which are essential elements of creativity. The importance of reflection in creativity is important when teaching children how to recognize mistakes and in turn to redefine their choices (Sternberg, 2003).

Here again, creativity is related to the ability to delay gratification and maintain the motivation to persevere. Creativity creates an environment where hard work is not immediately rewarded. Educators and parents can help young children develop these skills by promoting long-term projects at home or in school where children have to wait for a reward (Sternberg, 2003). Suggestions for creative enhancement include the intention to be creative. Teachers should first make it a student's goal to learn knowledge/basic skills as they are essential for the development of creative potential. More knowledge allows for more opportunities to recombine information, thus helping build upon potential to secure creativity (Paulus & Brown, 2003).

### Questioning and Risk Taking

While constant questioning in a classroom is not reasonable, providing children with the opportunity to ask questions and teaching students what questions to ask and how and when to ask them is paramount in the process of creativity. This ability will help children understand that what matters is the ability to apply facts rather than memorize facts. In promoting creative thinking and critical thinking, children must learn to ask questions and develop arguments to persuade other people of the value of their ideas

demonstrating why their ideas make an important contribution. Taking internal ownership for one's ideas is the first step in self-advocating and developing the self-esteem and self-confidence to be creative. External reinforcement is also important **until** children can learn to self-advocate based on the self-evaluation of their ideas.

### **Curiosity and Open-Endedness**

Curiosity is a trait that allows children to learn to explore, ask questions, wonder, and create. Teachers and parents need to allow for situations for young children to explore within a safe environment. This practice exploring, wondering, and being exposed to a rich learning environment will become part of the child's learning mindset. Curiosity and open-ended activities that allow for multiple responses and assessments include more students in the process of creativity. For example, Yan (2005) investigated the relationship between the open-endedness of activities and creativity in early childhood among at risk (i.e., low income) students and found a positive correlation, suggesting students significantly improved in creativity when the degree of open-ended activities was increased in their curriculum. Further, Kim (2008) recognized that open-ended assignments or open-ended components in the classroom contribute to the success of highly creative students in promoting intellectual playfulness. Promoting intellectual playfulness (i.e., finding pleasure in learning) gave rise to an increase in productivity following the break compared to individual brainstorming continuously without a break.

### **Storytelling**

Child-centered storytelling and dramatization can enhance children's creativity in early childhood education when originality is preserved through effective prompts employed in the process (Wright, Bacigalupa, Black, & Burton, 2008). Prompts give students a starting place to jump off into their own direction. Having prompts such as opening prompts, continuation prompts, and closing prompts help to scaffold the creative process until students can independently create (Wright, 2008). One of the most

important skills a parent or teacher can have is patience when faced with the unsophisticated nature of children's stories because such situations are found to improve communication between teachers, parents, and children. Similar to storytelling, Gupta (2009) found that dramatic play enhances development in creativity when the activity was child-initiated and teacher-directed. Dramatization of children's original stories allowed individual development within a social context, enhancing children's, language, cognitive, socio-emotional, and creative skills (Gupta).

### **Cultural Influences**

Culture can have an influence on how creativity is promoted in education. In Chinese culture, children were expected to master basic skills before exhibiting their own creativity, while the European/American view rests on the idea that natural development of intrinsic creativity in children is not to be corrupted by strict guidance (Huntsinger et al., 2011). Findings suggested that at the same age, Chinese children exhibited higher levels of creativity in their drawings due to their development of representational skills. This study compliments the Vygotskian perspective of constructivism suggesting children benefit from adult guidance by bringing children into their zone of proximal development in learning to draw, as they do in learning to speak (Huntsinger et al.). This implies creativity might be enhanced by the incorporation of intentional teaching (structured guidance) in early childhood education in order to promote the developmental skills in young children that would give them the opportunity to express their creative ideas later in their development (Huntsinger et al.).

Europe's current dedication to foster creativity and cultural development in early childhood education introduces new perspectives and ways of thinking about young children's creative and cultural developments that challenge traditional perspectives (Faulkner et al., 2006). The authors argue children are active agents in the creation of their own cultures rather than passive recipients, demonstrated through the spontaneous songs that children engage in across cultures. Barret (cited



in Faulkner et al.) draws her conclusions from a longitudinal ethnographic case study of a young child's musical development in which she states that invented song is a dialogic tool that children use to express their identity and construct cultural meanings and understanding and therefore should be encouraged.

## What Does Not Work

### Impatience

It is important not to quash curiosity; and those who are invalidated for being curious or inquisitive will often inhibit their ability to ask future questions and explore the mysteries of the universe that provide content to promote creativity. Formalized and institutional public education systems often suppress curiosity in more ways than promote it; curiosity leads to creativity (Sternberg, 1999; Wright et al., 2008).

### Preventing Groupthink

Group interaction can significantly enhance creativity, yet group blocking can occur due to social influence that can prevent equal contribution. Group performance can be improved through the use of cooperative learning techniques and brainwriting. Brainwriting is established when each group member shares their thoughts on a piece of paper one at a time (Paulus & Brown, 2003). This process reduces blocking and reinforces writing and reading rather than speaking and listening (Paulus & Brown).

## Summary

During the past six decades, the study of creativity and creative behavior has escalated to more fully understand in what ways we can observe, measure, and nurture creativity in children and adults. Because our world is ever-changing, we must continually adapt to our environments. Our environments are changing rapidly, and the advent of technology has stimulated a cultural evolution that demands we learn to think critically and behave creatively.

Parents and teachers can nurture creative behavior in their children and students by building psychologically safe environments where children can take risks, fail, and persevere. Children must be able to explore multiple solutions to issues and problems presented to them. Parents and teachers must also know enough about how creativity can be nurtured in order to scaffold activities and develop exciting curriculum and instruction methods. Parents must be present in their children's lives and provide multiple opportunities for children to observe museums and zoos. A healthy home life where all have a voice is important to teach children to be confident. Knowledge and basic skills need to be nurtured in order for children and students to have concepts to manipulate creatively. This knowledge can be disseminated through multiple teaching strategies that support a variety of learners and engage every student. Student choice and interest are highly important in early school years to teach children that learning is play. Through play, students will imagine, risk, share, and develop rich understandings of their world. By appreciating children's unique strengths, mentors can guide children to self-reflect on how they learn best. Having a love for learning will encourage curiosity and question asking. These questions lead to more and a personality of creativity develops.

Children must be prepared by parents, teachers, and mentors to critically think and problem solve. Because the jobs of the future have not been created yet, we cannot prepare children completely. We can prepare them to be actively engaged and curious. These positive human qualities better prepare us to adapt to novel environments.

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## Dental Health During Childhood

Charlotte W. Lewis

Department of Pediatrics, School of Medicine,  
University of Washington, Seattle, WA, USA

### Introduction

Dental caries (also known as dental decay) is the most common chronic disease of childhood – five times as common as asthma (U.S. Department of Health and Human Services, 2000). Caries is painful, expensive to treat, and can lead to tooth loss, as well as serious complications. Although almost entirely preventable on a primary level, by the end of childhood, two-thirds of individuals have experienced caries (Beltran-Aguilar et al., 2005). Caries disproportionately affects certain children, leaving other children minimally affected. This fact points to the importance of accurately identifying high-caries-risk children before they develop caries so that they can then be targeted for intensive preventive efforts. Unfortunately, in the United States, we are not yet at a point, either from the perspective of caries-risk prediction or prioritizing the oral health of vulnerable populations, that we are effectively implementing caries-preventive programs for children at high risk for caries. This is the case despite the fact that we have highly effective, evidence-based modalities for prevention of caries, of which fluoride and dental sealants are the most important.

### Definitions and Scope

#### Definitions

Dental caries results from bacterial action on teeth. Bacteria within biofilm (also called plaque) coat the teeth. Certain oral bacteria, *Streptococcus mutans* and *Lactobacillus* species among others, produce acid as the end product of carbohydrate metabolism. These acids dissolve the calcium phosphate mineral of the tooth's enamel ("demineralization"). If not reversed

through remineralization, the tooth structure continues to erode until the demineralized area collapses resulting in a "cavity" (Drury et al., 1999). Caries is a transmissible infection, passed vertically, usually from mother to child (Caufield, Li, & Dasanayake, 2005).

Primary prevention of caries refers to interventions that precede development of caries and, as such, avoid initiation of the dental decay process. For example, regular consumption of fluoridated water can provide sufficient topical fluoride exposure to tip the caries balance in the direction of remineralization of the teeth's enamel, thus preventing the onset of a carious lesion. Secondary prevention involves early identification of caries so that the decay process can be arrested or reversed. An example of secondary prevention is found in fluoride varnish, which when applied to "white spot lesions," the first visible evidence of dental decay, promotes remineralization and reversal of the decay process.

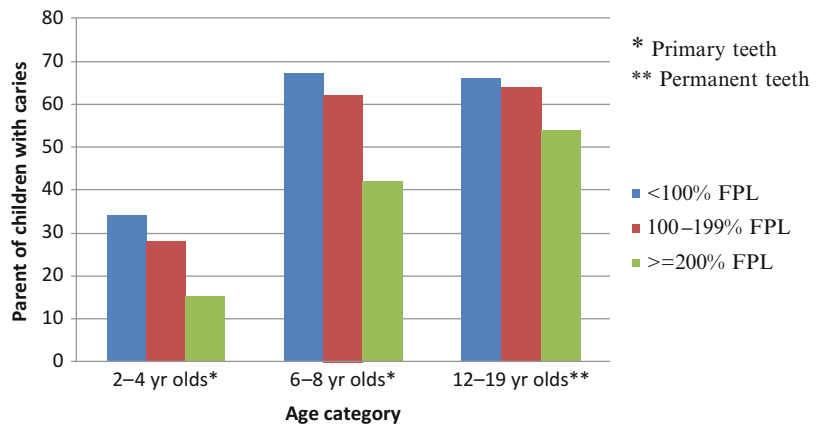
Caries may affect the primary (deciduous or "baby" teeth) or permanent dentition or both. Patterns of dental decay differ depending on the age of the individual when the decay process is first apparent. When children under the age of 6 years develop caries, this is referred to as "early childhood caries" (ECC). ECC may initially present as caries on the smooth surfaces of their primary mandibular (upper jaw) incisors (front teeth) and then progress quickly to involve most of the remaining primary dentition. This pattern of decay is different from that seen in the permanent teeth of older children and adults in whom the occlusal (pit-and-fissure) surfaces of the posterior teeth are most often affected. Older adults may experience caries in the crown or root surfaces of their teeth, which become susceptible to decay if gum tissue regresses.

#### Scope

Results of the third National Health and Nutrition Examination Survey (NHANES III) during 1999–2004 indicated that 24 % of 2- to 4-year-olds and 51 % of 6- to 8-year-olds had caries in primary teeth (Tomar & Reeves, 2009). Among 12- to 19-year-olds, 59 % had caries in permanent

### Dental Health During Childhood,

**Fig. 1** Prevalence of dental caries by age group and income category (Tomar & Reeves, 2009. Adapted by author, Charlotte Lewis, 2013)



teeth. Children living below 200 % federal poverty level (FPL) had significantly more caries relative to children at/above 200 % FPL (Fig. 1) (Tomar & Reeves, 2009). Until NHANES III, caries prevalence had declined over time in all age categories, but this trend reversed for 2- to 4-year-olds in 1999–2004, with a 5 % increase (from 19 % to 24 %) since 1988–1994 (Tomar & Reeves, 2009). The reasons for this increase are unclear.

The proportion of US children with *untreated* caries remained approximately the same in NHANES II and III. During 1999–2004, 16 % of 2- to 4-year-olds and 28 % of 6- to 8-year-olds had untreated caries in primary teeth, and 20 % of children 12- to 19-year-olds had untreated caries in permanent teeth (Beltran-Aguilar et al., 2005). Children living below 100 % FPL have two to three times as many untreated caries as children at/above 200 % FPL (Beltran-Aguilar et al., 2005). Insurance and income-based disparities in access to dental care are important contributors to differences in untreated caries by income. Despite mandated dental care coverage for low-income children under EPSDT (Early and Periodic Screening, Diagnosis, and Treatment) legislation, and more recently, S-CHIP (State Children’s Health Insurance Program) and CHIPRA (Children’s Health Insurance Program Reauthorization Act), it remains difficult for publicly insured children to access professional dental care. In 2005, just 37 % of Medicaid-enrolled children, ages 2–18 years, received dental care in the previous year (General Accounting Office, 2008).

Untreated caries can lead to toothache and other more serious complications. In 2008, approximately 15,000 US children presented to emergency departments with toothaches (Lee, Lewis, Saltzman, & Starks, 2012). Some of these children required hospital admission and/or surgery. A small number of children die from complications resulting from caries (Otto, 2007). Analysis of the 2007 National Survey of Children’s Health documented that 14 % of grade school children had experienced toothaches in the previous 6 months (Lewis & Stout, 2010). Being low-income, minority race, or having special health-care needs independently increased risk for toothache. In a 1992 study, 51 million hours of school were missed because of dental problems or treatment (Gift, Reisine, & Larach, 1992).

## Theory

### Cariogenesis

Dental caries begins with demineralization of a tooth’s outer structure. This in turn, allows the infection to potentially erode further into the tooth and invade the pulp (inner chamber of the tooth where the blood supply and nerve are located) and then into the surrounding tissues resulting in an abscess or draining fistula. An infection that begins as dental caries may spread beyond the mouth to cause a facial infection or brain abscess, among other serious complications.

Four factors – teeth, bacteria, fermentable sugars, and time – are needed for caries to

occur. Specifically, cariogenic bacteria that are present within biofilm on the teeth metabolize dietary carbohydrate to produce acid, which demineralizes the tooth structure. Saliva contains calcium, phosphorous, fluoride, antibodies, and buffering agents that can assist in remineralizing the tooth. This ongoing demineralization-remineralization dynamic can be pushed in the direction of demineralization if the biofilm pH persistently remains below 5.5, for example, with frequent snacking on carbohydrate-rich foods (and subsequent acid production by cariogenic bacteria metabolizing the carbohydrate). When snacking is less frequent, the biofilm pH has time to return to normal, which favors remineralization. Although seemingly simplistic, a complex interplay of behavioral, social, environmental, and genetic variables – some better understood than others – influences this process.

### Caries Risk Factors

In the pre-fluoride era, dental caries was a nearly universal experience. However, caries now disproportionately affects poor and low-income adults and children (Tomar & Reeves, 2009). Furthermore, caries risk factors cluster within families and communities since resources, habits, cultural and other beliefs, parental role modeling, dietary practices, and oral hygiene practices are more likely to be similar within members of a community and a family. Child-level risk factors for caries include higher levels of cariogenic bacteria (Warren et al., 2009), previous caries (Twetman & Fontana, 2009), visible plaque (Warren et al., 2008), consumption of sweetened liquids and candy (Ismail, Lim, Sohn, & Willem, 2008; Warren et al., 2008, 2009), suboptimal fluoride exposure (Wang et al., 2012), and infrequent toothbrushing (Martens, Vanobbergen, Willems, Aps, & De Maeseneer, 2006).

Colonization with cariogenic bacteria at a younger age is another key risk factor for caries (Harris, Nicoll, Adair, & Pine, 2004), and one that would be more common among family members (Caulfield et al., 2005). Studies utilizing serotyping, genotyping, or bacteriocin typing of cariogenic bacteria strongly support vertical transmission of cariogenic bacteria from

caregiver, most often the mother, to children. Caregivers who harbor more cariogenic bacterial loads (i.e., because of untreated caries and/or poor oral hygiene) may transmit these bacteria to offspring at earlier ages or to greater degrees and thus increase risk of more severe caries in their offspring (Berkowitz, 2006; Law, Seow, & Townsend, 2007).

Interrupting vertical transmission of cariogenic bacteria is a potential strategy to prevent caries in young children (Milgrom & Chi, 2011). Other parental characteristics that increase risk for caries in their children besides high levels of *Streptococcus mutans* (Ersin, Eronat, Cogulu, Uzel, & Aksit, 2006) and multiple decayed teeth (Thitasomakul et al., 2009) include a history of tooth loss from caries (Roberts, Warren & Weber-Gasparoni, 2009), poverty (Warren et al., 2008), fewer years of maternal education (Ersin et al., 2006; Nunn, Dietrich, Singh, Henshaw, & Kressin, 2009), less than twice-daily toothbrushing (Adair et al., 2004), and fatalistic oral health beliefs (Ismail et al., 2008). Less well understood but nevertheless important are the genetic factors underlying caries. Studies of twins provide evidence that genetics explains 40–65 % of caries (Vieira, Marazita, & Goldstein-McHenry, 2008).

Despite many variables associated with increased caries risk, predicting exactly which children are at higher risk for caries before they develop disease is challenging. Because high-caries-risk children develop ECC within the first few years of life, caries-risk assessment should take place before first tooth eruption, followed by implementation of a caries prevention program. However, the American Academy of Pediatric Dentistry's caries-risk assessment tool (CAT) and other screening tools rely on a history/presence of caries or predisposing dietary and/or oral health habits. Yet, if caries or habits associated with it are already present, then it is too late for optimal primary prevention. Low-income status (below 200 % FPL) is the only caries risk factor that can reasonably be ascertained at first tooth eruption and, thus, is an appropriate criterion for initial assignment to an intensive caries prevention program.



### Caries Prevention Modalities

There are four proven ways that caries can be prevented: (1) promote enamel mineralization (e.g., fluoride), (2) decrease cariogenic bacteria (e.g., antimicrobial agents and polyols), (3) decrease exposure to carbohydrate substrate (e.g., reduce sugar intake), and (4) place a barrier on the teeth to prevent demineralization and decay (e.g., sealants).

### What Works

#### Fluoride

Fluoride is a mineral found in small amounts in almost all soil, bodies of water, plants, and animals and, thus, is a normal constituent of all diets. Early fluoride researchers believed that fluoride achieved its decay inhibitory effects through incorporation into teeth prior to eruption – i.e., preeruptive. Under this assumption, fluoride was only beneficial for young children. Although fluoride does provide some preeruptive protection against caries, we now understand, based on in vitro, clinical, and epidemiologic evidence, that fluoride's effects are primarily posteruptive. Posteruptive effects mean that fluoride promotes net mineralization of the teeth after they are erupted (Beltrán-Aguilar & Burt, 1988). Demineralization and remineralization of the tooth enamel are a dynamic process. Remineralization is enhanced and demineralization is inhibited when low levels of fluoride are sustained in the saliva. When present, fluoride aids in the incorporation of calcium and phosphate ions into the enamel and is itself incorporated in the mineralization process. Fluoride-containing enamel, fluorapatite, is harder and less acid soluble than the original enamel that it replaces. Implications of fluoride's posteruptive mechanism of action are twofold: (1) fluoride continues to have beneficial effects throughout the lifespan (rather than just in early childhood as was previously believed) and (2) topical fluoride (e.g., fluoride toothpaste – FTP) is more effective and has fewer systemic side effects than oral fluoride supplements that are swallowed.

Excess fluoride intake may result in dental fluorosis, which refers to changes in the appearance of tooth enamel that are caused by increased ingestion of fluoride during the time when teeth are forming. In its mild form, fluorosis presents as white lacey markings on teeth. Teeth with very mild or mild fluorosis are more resistant to caries. More severe fluorosis manifests as enamel pitting and predisposition to staining and is rare in the United States. The degree of fluorosis is related to the timing, duration, and dose of fluoride ingested from all sources (water and other beverages, dental products, supplements) in early childhood (Adair et al., 2001). Once mineralization of the permanent teeth is complete, usually by 8 years of age, there is no longer a risk of additional fluorosis developing with future fluoride exposure. Esthetic considerations for fluorosis are most important for the permanent central incisors of the mandible, which are most susceptible to fluorosis before about 2 years of age (Adair et al., 2001; DenBesten, 1999; Hong et al., 2006). Fluorosis prevalence was assessed as part of NHANES III; during 1999–2004, 16 % of 6- to 49-year-olds in the United States had very mild fluorosis, 5 % had mild fluorosis, 2 % had moderate fluorosis, and less than 1 % has severe fluorosis (Beltrán-Aguilar, Barker & Dye, 2010).

*Sources of fluoride: community water fluoridation.* Fluoride is naturally present at varying concentrations in all bodies of water. An estimated 57.4 million people worldwide drink naturally fluoridated water in which fluoride is present at ~1 ppm (Anonymous, 2012). Community water fluoridation (CWF), in which fluoride is added to public water systems to bring the fluoride concentration up to an optimal level, is considered one of the 10 great US public health achievements of the twentieth century.

The concept of CWF was based on the observation that people living in communities supplied by naturally fluoridated water had fewer caries (Dean, 1938). This led to the landmark investigation in the early 1940s of caries and fluorosis levels in residents of 21 cities with varying levels of naturally occurring fluoride in the water. Results identified a concentration of about 1 ppm (1 part per million or 1 mg/L) of fluoride

in the water supply as that which allowed for maximal caries prevention with minimal risk of fluorosis (Dean, Arnold, & Elvove, 1942). In 1945, prospective field trials of community water fluoridation (CWF) in four pairs of treatment and control cities in the United States and Canada began. In these trials, CWF resulted in a 50–75 % reduction in caries in children from treatment cities compared to controls during sequential cross-sectional surveys over 15 years (Ast, Smith, Wachs, & Cantwell, 1956). Most studies of CWF focused on fluoride's effect among children, but it is now clear that exposure to fluoride has also decreased coronal and root caries among adults (Stamm, Banting, & Imrey, 1990; Yeung, 2007) and, thus, reduces the number of teeth that otherwise would have been lost to untreated decay.

Because bottled beverages, such as juices, are often produced with fluoridated community water, these liquids also contain fluoride. In a study of more than 500 juices and juice-flavored drinks, 43 % had a fluoride concentration above 0.6 ppm (Kiritsy et al., 1996). As Americans consume more soda and juice in place of water and milk, these beverages “diffuse” from fluoridated into non-fluoridated areas and have become increasingly important sources of dietary fluoride (Institute of Medicine, 1997). This phenomenon has two implications. First, consumption in non-fluoridated areas of beverages manufactured with fluoridated water means that dramatic differences in caries rates between cities with and without CWF, observed in original studies in the 1950s, are no longer as pronounced (Whitford, 1994). More recent CWF effectiveness studies in the United States have estimated that there are 25 % fewer caries in children who drink optimally fluoridated water compared to those who do not (Brunelle & Carlos, 1990). Second, this makes it more difficult to estimate fluoride intake for determining caries or fluorosis risk.

According to the Centers for Disease Control and Prevention (CDC) fluoridation census in 2010, 72 % of the US population on public water systems receive CWF (CDC, 2010). In 2011, the US Department of Health and Human Services announced a recommendation that the

optimal fluoride level in US CWF be decreased to 0.7 ppm (USDHHS, 2011). This recommendation was made because of increasing exposure to fluoride from sources other than CWF and concerns for increasing prevalence of dental fluorosis. Water fluoridation is not technically or financially feasible in many parts of the world, including most of Central/South America and Europe, in large part because there are not modern, centralized water systems (Gillespie & Baez, 2005). Instead, salt fluoridation (250 ppm), advocated by the World Health Organization (WHO), provides fluoride for population-based caries prevention in more than 30 countries (Marthaler & Petersen, 2005).

*Sources of fluoride: fluoride toothpaste.* The 1960s brought direct consumer marketing of fluoride toothpaste (FTP). This provided another source of fluoride in addition to supplements (drops or liquids) which had been introduced in the 1940s for children living in communities without CWF. Toothbrushing with FTP is a valuable delivery system for topical fluoride. After brushing with FTP, fluoride levels in saliva peak and then remain at low concentrations for 2–6 h, providing fluoride for enamel remineralization (Featherstone, 1999). In the United States, over-the-counter FTP, including those marketed for children, are allowed by the Food and Drug Administration (FDA) to contain either 1,000 ppm fluoride (1.0 mg fluoride/g of toothpaste, in the form of 0.76 % sodium monofluorophosphate) or 1,100 ppm fluoride (1.1 mg fluoride/g of toothpaste as 0.24 % sodium fluoride or 0.0454 % stannous fluoride). Lower concentration FTP (e.g., 250–550 ppm) is available in other countries. However, on systematic review, these toothpastes did not consistently reduce caries (Walsh et al., 2010). Lower concentration FTP is not FDA approved for sale in the United States.

FTP has many advantages over fluoride supplements. Acknowledging that fluoride works best when it is delivered topically rather than systemically (i.e., when swallowed), Canada (HealthCanada, 2010), England (Anonymous, 2009a), Australia (Anonymous, 2006), New Zealand (Anonymous, 2009b), and the European

Union (EAPD, 2009) no longer routinely recommended fluoride supplements, in favor of promoting FTP use in young children instead. Fluoride supplementation is still recommended by the American Dental Association for high-carries-risk children over 6 months old who reside in communities without CWF (Rozier et al., 2010).

Other advantages of FTP include that it is widely available in grocery and drug stores, does not require a prescription as supplements do, and is much less expensive at under 1 cent/day for FTP compared to 52 cents/day for fluoride supplements (e.g., in 2013, Colgate 360 Anticavity Fluoride Toothpaste, Dora the Explorer, 4.6 oz., costs \$2.99 on drugstore.com and would last more than 1 year at 50 mg/brushing or 100 mg of paste/day. A one-month supply of fluoride supplements (Flura-Drops 0.25 mg/drop) at Costco costs \$15.57 for a 30-day supply). Furthermore, FTP is widely used by older children and adults thus providing opportunities for modeling and instilling a lifelong habit early in life.

There is a large body of evidence about benefits of FTP in preventing caries. On systematic review and meta-analysis, daily FTP use resulted in 24 % fewer caries in permanent teeth and 13 % fewer caries in primary teeth, on average, when compared to non-fluoride toothpaste (Dos Santos, Nadanovsky, & de Oliveira, 2012). Furthermore, FTP's beneficial effects are increased with the following: (1) higher fluoride concentration toothpaste; trials indicate 6 % fewer carious lesions, on average, with every 500 ppm increase in FTP fluoride concentration above 1,000 ppm (Biesbrock et al., 2001; Twetman, 2009; Walsh et al., 2010); (2) twice-daily use, with a preventive fraction (PF) of 14 % when increasing from brushing once a day to brushing twice a day (Marinho, Higgins, Logan, & Sheiham, 2002a; Twetman, 2009); and (3) parent-supervised brushing (Hinds & Gregory, 1995; Twetman, 2009).

There are fewer data assessing the caries-preventive effects of starting FTP at younger ages, e.g., during infancy. Cross-sectional and population-based surveys in Europe have found

significantly lower prevalence of caries at 5 years of age and older when children began brushing with FTP before 1 year of age compared to those who started after 2 or 3 years of age (Hinds & Gregory, 1995; Verrips, Frencken, Kalsbeek, ter Horst, & Filedt Kok-Weimar, 1992). However, earlier FTP use is associated with increased fluorosis risk, presumably because very young children will swallow some FTP until they learn to spit out the residue. Concern over young children swallowing toothpaste has led to ongoing questions about "the right age" to start FTP. To make matters more confusing, commercial messaging about the "safety" of fluoride-free training toothpastes implies that FTP is thus unsafe for young children. Parents may attribute greater hazard to swallowing toothpaste than actually exists, potentially limiting the beneficial effects of FTP.

Empirically, using a smaller amount of FTP means less is swallowed and thus, a lower fluorosis risk. Two-year-olds ingest an average of about two-thirds of the toothpaste used in brushing (Naccache et al., 1992). Given this, if a child uses a rice-grain-size (50 mg of paste) amount of FTP during twice-daily brushing, he/she not only gains the beneficial effect of topical fluoride and ingests only ~0.08 mg of fluoride. Rinsing after brushing is contraindicated. For young children who do not know how to spit, rinsing causes more FTP to be swallowed (Naccache et al., 1992). Among older children, rinsing and spitting out the residue reduces the beneficial effect of the fluoride and results in more caries (Chestnutt, Schafer, Jacobson, & Stephen, 1998; Sjogren, Birkhed, & Rangmar, 1995).

How the balance of risks and benefits of early FTP is perceived has led countries to adopt different recommendations about the age to start FTP. One approach, currently employed in the United States, Australia, and Canada, is based on risk stratification with high-carries-risk children advised to begin FTP at first tooth eruption (MCHB, 2007), while low-carries-risk children should wait until 2 years of age (2 years is the US recommendation. It is 18 months in Australia and 3 years in Canada)

before using FTP. The other approach, used in England, recommends that *all* children, beginning in infancy, have their teeth brushed twice daily with “a smear” of at least 1,000 ppm FTP; at 3 years of age, the recommended FTP amount increases to pea size (250 mg of paste) and the concentration to 1,350–1,500 ppm (Anonymous, 2009a).

There are reasons to consider adopting England’s strategy of universal and early FTP initiation in the United States: (1) low-caries-risk young children also experience caries at not inconsequential levels; (2) caries prevalence among young children is unacceptably high and has increased (Dye et al., 2007); (3) even if a child does not spit after brushing with a rice-grain-size amount of FTP during twice-daily toothbrushing, fluoride intake from FTP is well below the fluorosis-risk level; (4) it establishes a habit early; and (5) it places appropriate emphasis on disease prevention.

*Sources of fluoride: professionally applied fluoride-containing dental products.* Dental professionals rely on a variety of fluoride-containing products, including foam, gel varnish, prescription-strength toothpaste, and mouthrinse, for caries prevention and treatment. The most thoroughly evaluated for pediatric use are fluoride gels and varnish. Applying these highly concentrated fluoride products to teeth, using a dual arch tray for gel or brush to paint on varnish, leaves a fluoride calcium compound on tooth enamel that releases fluoride whenever plaque pH decreases (Chestnutt et al., 2012). Both fluoride gel (Marinho, Higgins, Logan, & Sheiham, 2002a) and varnish (Marinho, Higgins, Logan, & Sheiham, 2002b) are effective in preventing caries, but FV has a number of advantages over gels, including that FV can be used in young children (gel is too easily swallowed), adheres better to the enamel surface, and allows for longer sustained levels of fluoride in the enamel crystal matrix. Furthermore, FV does not require special preparation of teeth, requires only brief training to become adept at its application, is generally acceptable to patients, is portable, and requires little storage space – all which make it easy to use in non-dental settings, e.g., in schools, public

health clinics, and medical providers’ offices. In most US states, physicians can be reimbursed to apply FV to children insured by Medicaid.

FV is effective in preventing caries in both primary and permanent teeth. Systematic reviews indicate that FV prevents 46 % of permanent tooth caries and 33 % of primary tooth caries (Azarpazhooh & Main, 2008; O’Keefe, 2011). FV’s impact differs depending on a population’s caries prevalence. The number-needed-to-treat to prevent one carious surface in primary dentition ranged from 3.7 children in low-caries communities to 1.6 children in high-caries communities. High-caries-risk children should be prioritized for at least twice-yearly FV beginning at first tooth eruption in order to optimize ECC prevention. An RCT in San Francisco demonstrated a PF of 58 % with twice-yearly FV in children enrolled at 20 months of age and followed for 2 years (Weintraub et al., 2006). In England, guidelines specify that all children receive FV 2 times/year and that high-caries-risk children receive FV 3–4 times/year (Anonymous, 2009a).

*Community-based delivery of fluoride dental products.* Community-based delivery of fluoride dental products to high-caries-risk population has been shown to be effective in preventing caries. Fluoride mouthrinses have been part of school-based caries prevention programs in the United States; a systematic review found that in populations with a caries increment of 2.14 caries lesions per year (i.e., high), two children will need to rinse to avoid one carious lesion (Poulsen, 2009). Children younger than about 7 years of age should not use fluoride mouthrinse because they typically are not able to spit it out and instead tend to swallow it. Supervised classroom toothbrushing with FTP is more common in Europe and results in a PF of 23 %, based on systematic review (Twetman et al., 2003). Other community-based strategies for caries prevention in young children include free or reduced cost FTP distribution. An English RCT that evaluated a free FTP mail distribution program, targeting children living in low-income communities beginning at 12 months of age, resulted in significantly fewer carious teeth at 5 or 6 years of age (Davies et al., 2002).

### Dental Sealants

Dental sealants, a thin coating applied to the occlusal surfaces of molars, are another primary prevention modality effective against caries in pit-and-fissure surfaces of permanent teeth, which is where school-aged children develop the vast majority of dental decay. Pit-and-fissure sealants can also be applied over incipient caries thus providing secondary caries prevention (Beauchamp et al., 2008).

Sealants are generally applied to permanent first and second molars when they erupt, at about 7 and 12 years of age, respectively. Children at high risk for caries may also benefit from sealant placement on their primary teeth (Beauchamp et al., 2008). There are two types of pit-and-fissure sealant materials – resin-based sealants and glass ionomer cements – and there are advantages and disadvantages to each. The effectiveness of sealants depends on how long the sealant lasts. Resin-based sealants are retained longer but require more tooth preparation and trained staff for effective placement. On the other hand, glass ionomer cements are less technique sensitive and contain fluoride, which may enhance their caries-preventive properties, but the main disadvantage to glass ionomer cements is that they do not last as long as resin-based sealants (Baseggio et al., 2010). The American Dental Association recommends resin-based sealants over glass ionomer (Beauchamp et al., 2008).

On an individual child level, a decision to place sealants may be based on characteristics of the child's pit-and-fissure surfaces and perceived susceptibility to caries (Beauchamp et al., 2008). A recent Cochrane Collaboration systematic review found that, compared to control teeth without sealants, resin-based sealants prevented caries in first permanent molars in children aged 5–10 years, at 2 years of follow-up, with an odds ratio (OR) of 0.12 and 95 % confidence interval (CI) of 0.07–0.19 (Ahovuo-Saloranta et al., 2013). Sealants can provide long-term protection against caries. One study demonstrated that, after sealants had been in place for 9 years, only 27 % of sealed tooth surfaces had caries compared to 77 % of tooth surfaces without sealants (Ahovuo-Saloranta,

Hiiri, Nordblad, Mäkelä, & Worthington, 2008). A decision to deliver sealants to a population (e.g., through school-based sealant programs) is usually based on increased risk of caries (based on lower socioeconomic status) within the population and lower likelihood that individuals within that population will have reliable access to regular professional dental care. Evaluation of school-based sealant programs directed at high-caries-risk groups of children has found such programs to be effective in lowering caries rates and reducing dental care expenditures (Chalmers, 2011; Gooch et al., 2009).

### Polyols

Polyols (sugar alcohols such as xylitol, mannitol, and sorbitol), contained in chewing gum, lozenges, syrups, and other products, have antimicrobial effects against cariogenic bacteria, and their regular use is caries protective (Lynch & Milgrom, 2003; Scheinin, Mäkinen, & Ylitalo, 1976). There are more data on xylitol's caries-preventive effects than the other polyols; xylitol appears to directly inhibit *Streptococcus mutans* metabolism (Waler, 1992). Polyols may also disrupt biofilm organization and adherence as an additional caries-inhibitory mechanism (Milgrom, Soderling, Nelson, Chi, & Nakai, 2012). A compelling example of the benefits of polyol-containing chewing gum on caries took place in a 40-month double-blind cohort study performed in 1989–1993 among 1,277 high-caries-increment, school-aged children in Belize, Central America; in comparing caries rates in children who had been assigned to no gum, sucrose, sorbitol, sorbitol-xylitol combination, or xylitol-containing chewing gums, used five times daily, the greatest caries-preventive effect occurred in the xylitol chewing gum group in whom caries rates were 73 % lower than in the no-gum controls (Mäkinen et al., 1996). Use of xylitol-sorbitol combination and sorbitol chewing gum also significantly reduced caries relative to controls but to a lesser degree than xylitol (Mäkinen et al., 1996). More recent studies of xylitol and polyol combination chewing gum in children with lower caries levels have, overall, demonstrated



significant but less dramatic reductions in caries (Deshpande & Jadad, 2008).

## What Might Work

### Flossing

It is common to promote flossing along with toothbrushing, and indeed, it makes empiric sense to use floss to remove bacteria-containing plaque from between teeth, where toothbrushing cannot reach. Yet, studies of self-performed flossing by children and adolescents have failed to show a beneficial effect in preventing interproximal caries (Hujoel, Cunha-Cruz, Banting, & Loesche, 2006). It may be the self-flossing technique or compliance is at fault. In the Dorchester Dental Flossing Study (Wright, Banting, & Feasby, 1979) conducted in Canada in the early 1970s, 6-year-olds had half of their teeth flossed (the other half of the mouth was the control) by “research assistants” (actually, mothers helping out in the classroom who were trained in flossing) every day that they were in school for 17 months (Wright et al., 1979). There were 40 % fewer interproximal caries in the teeth that were flossed, suggesting that a competent, compliant parent who flosses his/her young child’s teeth daily could potentially decrease caries between teeth. The question remains about whether competent, compliant older children could effectively decrease interproximal caries by flossing their own teeth on a daily basis.

### Oral Health Promotion

In addition to fluoride, polyols, and sealants, reducing exposure to the substrate for cariogenic bacteria – specifically, carbohydrates and, in particular, sucrose (Rekola, 1989) – lowers caries risk in efficacy trials (Loesche, 1985; Scheinin et al., 1976). Preventive oral health promotion such as counseling parents of young children about reducing intake of high-sugar foods and beverages and about the importance of twice-daily toothbrushing with FTP may be an effective caries-preventive strategy (SIGN, 2013). However, complying with such advice is more complicated when it involves behavior

change. There are a variety of strategies, underpinned in theory, for promoting change in health-related behavior although health professionals are not always well versed in effective techniques to motivate behavior change in their patients. Interventions relying on community lay educators and that use a one-on-one approach when promoting preventive oral health among parents of young children appear to be more successful (Rozier, 2001).

### Interrupting Vertical Transmission of Caries

There is evidence indicating that interruption of or delaying transmission of cariogenic bacteria from adult caregiver to young child could be an effective caries primary preventive strategy (Milgrom & Chi, 2011). Efforts to reduce cariogenic bacteria load in caregivers (so that less bacteria will be transmitted to offspring) have centered on provision of restorative dental care to excavate large reservoirs of cariogenic bacteria in the caregiver’s mouth and regular use by caregivers of topical antimicrobials such as topical iodine, chlorhexidine mouthrinse, xylitol (or other polyols), chewing gum, or a combination of these approaches (Milgrom & Chi, 2011). More studies are needed before definitive recommendations can be made about target populations and which specific therapies, in what combination, and at what dose are most effective. An even more important barrier to implementing this strategy on a larger scale is that there are few resources for lower-income and uninsured parents of young children in the United States to receive preventive or restorative dental care such that they could effectively reduce their oral burden of bacteria if they have untreated caries. Disparities in dental care access and oral health status among lower-income adults likely perpetuate high caries levels across generations.

### What Does Not Work

Ozone is toxic to certain bacteria *in vitro* and it has been suggested that ozone delivered to a susceptible tooth might prevent caries. A Cochrane review of ozone trials for caries



prevention found no sound evidence that ozone is capable of reversing or stopping the progression of tooth decay (McComb, 2005).

### Areas of Controversy

In the United States, we have yet to answer this important question: “What is the best way to deliver caries primary preventive services, particularly to those children who need it most?” Using highly trained, highly reimbursed health professionals like dentists to deliver dental caries primary prevention makes little sense either from an access or cost perspective. There are inadequate numbers of dentists to deliver primary preventive services to all children. Most pediatric dentists work in more populated and urban areas, while general dentists, who may work in smaller communities, can see young children but often do not feel comfortable doing so (Seale & Casamassimo, 2003). Thus, geography may prevent a number of young children from accessing caries-preventive care if it is relegated solely to dentists.

The bigger problem, however, is that many children in the United States are unable to access professional dental care because they do not have private dental insurance or their parents lack cash to pay out of pocket for dental care (Smith & Lewis, 2005). The result is that, in our current dental care system, low-caries-risk children (i.e., higher-income, healthy children) are easily able to access professional dental care in a dental office setting where they receive relatively expensive preventive services that they may not need, while high-caries-risk children are unable to access needed primary or secondary caries-preventive care and thus suffer a disproportionate share of more advanced dental caries.

It is unlikely that our current, predominately private practice dental care model will change in the near future, at least in such a way that would allow universal access to professional dental care. Our public health dental care system is substantially underfunded, and what little resources are available are often allocated to

treatment, leaving caries prevention to fall by the wayside. An alternative public-health-based model relying on dental hygienists and dental paraprofessionals, such as the dental therapists (Wetterhall, Burrus, Shugars, & Bader, 2011), could deliver cost-effective primary and secondary caries prevention to large groups of children in community settings. However, this model would require expanding dental therapist training programs, establishing appropriate infrastructure for these services to be delivered, as well as overcoming the resistance of organized dentistry. Nevertheless, if such a model could be further developed such that dental therapists and dental hygienists deliver primary and secondary prevention to the vast majority of US children, this would allow dentists to do exactly what they are uniquely and best trained to do: treat dental disease and restore function.

### Summary

Expanded availability of fluoride is largely acknowledged as the major factor responsible for the declining prevalence of caries in the United States over the last 40 years, saving \$39 billion (1990 dollars) in dental care expenditures in the United States from 1979 to 1989 (Brown, Beazogdlou, & Heffley, 1994). There is an overwhelming abundance of evidence that CWF and FTP are highly effective in preventing dental decay, and these two modalities should form the cornerstones of population-based strategies aimed at primary prevention of caries in all children (and adults as well). Other effective fluoride-based strategies should be considered adjuncts, which can be targeted towards individuals and groups at high risk of caries. These adjuncts include fluoride mouthrinses, gels, and varnishes.

Among non-fluoride caries-preventive agents, dental sealants are an important strategy for prevention of caries in the pit-and-fissure surfaces of permanent molars, particularly when directed towards high-caries-risk children (Chalmers, 2011). Regular use of polyols is also effective in preventing caries; a recent systematic

review by the American Dental Association found sufficient evidence to recommend three-times-daily use (after meals) of xylitol or polyol combination chewing gum or xylitol lozenges for primary prevention of caries in children older than 5 years of age.

Certain children, primarily defined by poverty, experience large number of caries, yet we are not yet effectively identifying and directing these children to intensive primary prevention programs because our current dental system does not prioritize delivery of dental care to children from high-caries-risk groups. To realize our potential to prevent virtually all dental caries will require an overhaul of our current dental care delivery model. A vision for a public-health-centered system would ensure that all children receive cost-effective primary preventive care and children at risk for more severe caries could be targeted for intensive, evidence-based primary and secondary prevention, regardless of their insurance status or ability to pay.

Consideration should be given to initiating FTP at first tooth eruption as “standard caries primary prevention” for all US children. Because poor and low-income children experience more caries, they should receive an “intensive caries primary prevention” program comprised of, in addition to twice-daily FTP use, at least twice-yearly FV, prioritization for early and regular professional dental care, dental sealants, and targeted community-/school-based caries-preventive interventions. A dual-track (standard vs. intensive) primary prevention approach emphasizes the importance of caries prevention for all children while also addressing the substantial oral health disparities that adversely affect the health and well-being of millions of US children (GAO, 2008).

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## Depression During Childhood

Clare Roberts

School of Psychology and Speech Pathology,  
Curtin University, Perth, WA, Australia

### Introduction

Until the 1970s it was widely believed that children did not get depressed (Baker, 2006). However, we now know that even preschool children are more emotionally sophisticated (Luby, 2009). Children with depression report symptoms such as sadness, irritability, tearfulness, depressed mood, loss of appetite, sleep disturbance, poor concentration, loss of energy, social withdrawal, somatic complaints, and a lack of interest in usual activities. Their suffering leads to impairments in home, school, and interpersonal contexts. While less common in childhood, preschool depression has been identified, and it can result in ongoing depression throughout primary and secondary school.

Childhood depression includes depressed mood which may be transient or ongoing and is usually identified as feeling sad or unhappy (Roberts, Bishop, & Rooney, 2008). Children younger than 7 years may not be able to describe these feelings and may express their symptoms via somatic or irritable symptoms. These symptoms can lead to poor concentration, impaired attention, social withdrawal, and sometimes hostile behavior. Childhood depression can be chronic, up to 24 months (Luby, Si, Belden, Tandon, & Spitznagel, 2009).

### Definition and Scope

Preschool and childhood depression are similar; they can be distinguished from other early-onset psychiatric disorders. Depressed preschoolers have four times the likelihood of developing major depressive disorders compared to typical preschoolers (Luby, 2009). Markers include low mood, feeling bad or blue, crying more than

usual, irritability, as well as a lack enjoyment and feeling pleasure. Cognitive markers include low self-esteem, lack of confidence, trouble making decisions, focusing, and poor concentration. Somatic symptoms may lead to changes in appetite, sleep cycle, energy levels, and weight. Costello, Mustillo, Erkanli, Keeler, and Angold (2003) reported the 3-month prevalence for any depressive disorder at 2.2 % (confidence intervals, 1.6–3.0) in children 9–13 years. The rates rise around 13 years, where 36.7 % of the children have met at least one or more criteria by 16 years. This disorder shows chronicity up to 24 months. Preschoolers with MDD are 11.3 times as likely as children with no disorders to be depressed 2 years after diagnosis (Luby et al., 2009). Eighteen percent show a chronic course, while 35 % recover. Depression in children includes functional impairment and symptoms that occur regularly for two or more weeks. Depressive diagnoses include major depressive disorder and dysthymia.

Symptoms include sad, depressed, or irritable moods and loss of pleasure on most days of the week, for at least 2 weeks. Children also experience symptoms such as suicidal ideation, loss of appetite, sleep and weight change, loss of pleasure, and irritability. If symptoms occur on most days of the week for 2 weeks, a clinical diagnosis can be made. Structured clinical interviews and questionnaires are used to assess child depressive disorders (APA Diagnostic & Statistical, American Psychiatric Association, 2010). Childhood depression is associated with comorbid axis I disorders and more negative events (Fernando et al., 2011). Preschool depression shows chronicity, recurrence, and homotypic continuity during a 24-month period (Luby et al., 2009).

Childhood depression is almost as prevalent for males and females, but the burden of depression is 50 % higher for females than males. Depression is one of the leading causes of child mental health burden. In any given time, 15 % of children and adolescents have symptoms of depression (Bhatia & Bhatia, 2007). In mental health settings, the prevalence is around 60 % of referred children reporting depression

symptoms and 25 % receiving a diagnosis of major depression (Baker, 2006). Hence, childhood depression is an important target for preventive efforts.

## Theories

Theories need to consider the impact of development on depression and the impact of depression upon emerging developmental processes. Roberts et al. (2008) summarized the theories and implications for interventions in the following four pages.

*Genetic Theories:* Twin studies show 50 % of mood disorders are genetic. However, childhood depression can be explained more by environmental factors than heritability.

*Biological Theories:* Somatic and psychological symptoms relate to biological dysfunctions, in the hypothalamic–pituitary–adrenal (HPA) axis leading to sympathetic nervous system problems, affecting emotions, guilt, and hopelessness (Sharpley, 2010). Psychomotor abnormalities, weight loss, and sleep disturbances occur, in the thyroid axis, and REM sleep can be disrupted (Maletic et al., 2007). The amygdale is also implicated via altered emotional processing in child major depression (Luking et al., 2011).

*Cognitive Theories:* Cognitive errors/schema, attribution style, personal control, and self-control theory are just a few of the diathesis–stress theories. Children’s perception and processing of adverse events leads to depression rather than aversive events alone (Roberts et al., 2008). Child depression has a more direct role compared to teens and adults (Luking et al., 2011). Interpersonal cognitions are strongly associated with child depression, while genetic influences are small (3 %), reflecting life experiences (Lau, Rijdsdijk, Gregory, McGuffin, & Eley, 2007). Beck (2011) found that depressed children make systematic errors in interpretation and negative self-talk. These become stable, internal belief systems that structure memory and guide information processing, leading to a “negative cognitive triad” of the self, the world, and the future. Peterson and Seligman’s (1984) theory

of pessimistic attribution style attributed negative outcomes to internal, global, and stable causes and positive outcomes to external, specific, and temporary causes, leading to helplessness, hopelessness, and depression in the face of negative life events.

Weisz et al.’s (1992) locus of control theory suggest low perceived competence, external locus of control, and depression are linked. Bandura, Pastorelli, Barbaranelli, and Caprara (1999) proposed that belief in one’s ability to regulate functioning and to control events that affect your life is strongly related to depression. Gladstone and Kaslow’s (1995) meta-analyses found moderate to large effect sizes for children’s pessimistic attribution style and depressive symptoms. However, the diathesis–stress effect was only found in younger children. Compas, Banez, Malcarne, and Worsham (1991) reported that children’s perceptions of contingency, competence, and control are not well developed until 11 years of age.

Weisz, Sweeney, Proffitt, and Carr (1993) found positive associations between depressive symptoms and perceived competence and contingency beliefs in late childhood only. Cognitive deficits occur in self-monitoring, self-evaluation, memory impairments related to recall of success, setting harsh standards, and negative self-cognitions, in depressed children, but positive self-evaluations can compensate (Roberts et al., 2008). This begins early with negative cognitive processes, such as worry and rumination in response to repeated environmental stressors (Topper, Emmelkamp, & Ehring, 2010). These become habitual by late childhood. Hence, the importance of targeting repetitive negative thinking and worry.

*Behavioral and Interpersonal Theories:* Lewinsohn (1974) conceptualized depression as the consequence of skills deficits that are associated with low rates of response contingent positive reinforcement. However, Hammen et al. (2011) noted an association between stressful life events and the prevalence of depression, anxiety, and PTSD, related to the childhood adversity. The effectiveness of children’s solutions moderates the relationship between negative life stress and depressive symptoms.

However, some negative self-perceptions of depressed children may be realistic.

*Environmental Stress Theories:* Cognitive and interpersonal theories of depression include stress-reactive models and stress-generation models. Rudolph et al. (2000) reported that depressed children generate stressful circumstances in the interpersonal domain, which in turn results in depression.

*Family Theories:* Insecure infant attachments contribute to the development of internal self-models and impact upon cognition, affect, and behavior (Cicchetti & Toth, 1998). Social learning occurs via the day-to-day parent-child interactions (Rapee, Wignall, Spence, Lyneham, & Cobham, 2008). While attachment difficulties include failure to attach by 6 months to 3 years, disorganized insecure attachments, separations and loss of attachment figures, and disorganized attachments can result in maltreatment or parental trauma (Main, 1996).

*Current Research:* Treating postnatal depression is important for childhood depression in particular and parental depression in general (Porter & Hsu, 2003; Rishel, 2012). Also, children who experience multiple stressful life events may benefit from targeted interventions. Cognitive and interpersonal strategies in children's depression prevention programs should target cognitive errors, pessimistic attributions, self-esteem and self-perceptions, social and friendship skills, interpersonal problem solving, personal competencies, and coping skills. Munoz, Beardslee, and Leykin (2012) report that 22–38 % of major depression episodes can be reduced if children and adolescents receive evidence-based interventions. Family models that emphasize attachment, parent-child interaction in child rearing, are also important. Family group cognitive behavioral interventions have found significant efficacy for internalizing and externalizing symptoms, and effects increase at 18- and 24-month follow-up (Compas et al., 2011).

## What Works

Depression prevention strategies have increased significantly since the last entry published

in 2001. A Cochrane Review of psychological and educational interventions for prevention of depression (Merry, McDowell, Hetrick, Bir, & Muller, 2009); a paper on evidenced-based psychosocial treatments for child and adolescent depression (David-Ferdon & Kaslow, 2008); an entry by Roberts et al. (2008) on depression disorder in childhood and adolescence; and a meta-analytic review by Stice, Shaw, Bohon, Nathan Marti, and Rohde (2009) have been published on prevention for childhood and adolescent depression.

Psychosocial treatments work for childhood depression, when conducted in community and school settings (Compton et al., 2004; Compton, Burns, Egger, & Robertson, 2002; Curry, 2001). Michael and Crowley's (2002) meta-analysis found nine controlled trials and three pre-post uncontrolled trials, with a large effect size 0.65 (95 % CI 0.34–0.94) for controlled trials with children. The effect sizes were slightly lower than those for adolescent trials (0.93), but larger than effects for psychopharmacological treatments for depressed children (mean ES = 0.15).

Cognitive behavior therapy (CBT) works for children. Five randomized controlled trials of depressive symptoms have all been based on behavior therapy or cognitive behavior therapy (Compton et al., 2002, 2004; Curry, 2001). Group-based interventions with school children with elevated symptoms work as do group CBT and individual CBT interventions (Vostanis, Feehan, & Grattan, 1996). Three additional studies were based on psychoeducational sessions for families that were adjunct to the child's intervention. These were conducted in groups in the home (Asarnow, Scott, & Mintz, 2002).

Merry et al.'s (2009) Cochrane Collaboration investigated psychological and educational interventions in reducing childhood depression, by treating it early or preventing the onset of depressive disorders in children. Of the 21 studies, 18 psychological studies related to psychological interventions and 12 psychological prevention programs were implemented universally. Six of these programs relate to children (Cardemil, Reivich, Beevers, Seligman, & James, 2007; Pattison & Lynd-Stevenson, 2001;

Quayle, Dziurawiec, Roberts, Kane, & Ebsworthy, 2001; Roberts et al., 2010; Swannell, Hand, & Martin, 2009). Eight prevention programs were targeted groups based on at-risk samples with high depression scores, four of these included children, or social disadvantage (Roberts, Kane, Thomson, Bishop, & Hart, 2003). Many of these prevention programs are derivative of the PENN Prevention program (Cardemil et al., 2007; Jaycox, Reivich, Gillham, & Seligman, 1994; Quayle et al., 2001; Roberts et al., 2003, 2010; Rooney et al., 2006). All programs are manualized and have training programs for implementation.

This review indicated that targeted programs reduced depression by a standardized mean difference of  $-0.26$  with a 95 % confident interval of  $-0.40$  to  $-0.13$ . The effect sizes were small, but they resulted in significant reduction in depressive episodes, but not depressive symptoms. Universal interventions were shown to be not effective (SMD  $-0.21$ , 95 % CI  $-0.48$ ,  $0.06$ ). However, they did prevent depressive episodes. The overall difference after intervention translated to treating ten children for one child to recover. However, this is a treatment effect, not preventative. Clarke's et al.'s (2001) targeted program is the most effective intervention, but the program treats the symptoms and is not truly preventative, with children. Stark, Hargrave, Hersh, Greenberg, Herren, and Fisher (2008) found that cognitive behavior therapy for children is efficacious for both adolescents and children. Psychoeducational interventions may also be useful. Petersen and colleagues' (1997) 16-session manualized program was delivered to 6th- and 7th-grade students, by graduate students with good efficacy.

Nine studies reported depression outcomes in children (Clarke et al., 1995, 2001). Effects were evidenced at posttest only. The targeted programs reduced depression with a SMD of  $-0.26$  at 95 % confidence interval ( $-0.40$  to  $-0.13$ ). The universal programs were not effective (SMD of  $-0.21$ , CI  $-0.48$ ,  $0.06$ ). At a follow-up there were no significant effects for targeted or universal interventions. At 12 months, two studies of targeted interventions (Clarke et al., 1995, 2001)

found a decrease in depressive disorders (RD  $-0.12$ , CI  $-0.24$ – $0.01$ ), while universal interventions did not. However, these were adolescents. Six studies of depressive disorders showed effectiveness at posttest. However, this was only for girls (RD  $-0.14$ , CI  $-0.23$ ,  $-0.04$ ) compared to boys (RD  $-0.07$ , CI  $-0.15$ ,  $0.01$ ). There was no evidence of efficacy at follow-up, but one study found a significant decrease in scores for the high-risk group (Cardemil et al., 2007). Six studies (Gwynn & Brantley, 1987; Hains & Ellmann, 1994; Pattison & Lynd-Stevenson, 2001; Roberts et al., 2011) reported effects for internalizing problems at posttest but not at follow-up. Rooney et al. (2006) reported effects up to 4 years after the intervention. Four of the six interventions reported reduction in symptoms. Various measures were used, but all were compared to either usual care conditions or no intervention.

Change in depression scores was generally small. The numbers needed to treat (NNT) was 10, encouraging for a prevention trial. Depressive diagnoses both targeted and universal interventions were viable, with an NNT of 8 for targeted interventions and NNT of 13 for universal interventions. Merry et al. (2009) indicated that the lack of placebo or comparison groups makes it difficult to ensure that the findings are due to the research procedure. Merry's Cochrane Collaboration suggests that there was not sufficient evidence to implement depression programs currently, but there is a need to compare interventions to placebo or other active comparison groups. Booster sessions could be used to prolong the effectiveness of the intervention. There may also be a place for gender-based groups, as girls and boys may respond differently to the programs.

David-Ferdon and Kaslow (2008) reviewed the evidence on child and adolescent depression. They found that for children, the school-based self-control therapy was effective with elevated depressive symptoms (Stark, Rouse, & Livingston, 1991). This intervention met criteria for a probably efficacious intervention. The program is based on cognitive behavior therapy (CBT), and the intervention includes symptoms

monitoring, cognitive restructuring, social skills training, social problem solving, coping skills, relaxation, and scheduling pleasant events. Stark et al. (2007) published *The Action Treatment Program Intervention* in 1990, following research on a comparison of the relative efficacy of self-control therapy and behavioral problem solving. This intervention has worked in three successful trials, Stark et al. (1987) and Stark et al. (1991) two randomized controlled trials and an independent open trial, conducted by Rehm and Sharp (1996). Adjunct psychoeducational sessions for families were also used in groups (Rehm & Sharp, 1996) and home settings. Six of the eight randomized control trials using school-based samples have reported reductions in depression, and effect sizes are large to moderate 1.68 (Kahn, Kehle, Jensen, & Clarke, 1990) and 0.48 (Weisz, Thurber, Sweeney, Proffitt, & LeGagnoux, 1997). Weisz and Jensen (2001) reviewed the child and adolescent psychotherapy in research and practice contexts. The efficacy of structured treatments administered under controlled conditions shows significant evidence of benefits, compared to treatment as usual. Stark et al. (2007) have developed a therapist manual, *Treating Depressed Youth: Therapist Manual for ACTION* (Stark et al., 2007).

There have been eight intervention studies with children at risk for depression because of elevated symptoms (Asarnow et al., 2002; De Cuyper, Timbremont, Braet, De Backer, & Wullaert, 2004; Gillham, Hamilton, Freres, Patton, & Gallop, 2006; Roberts et al., 2003). There have also been two studies with children who met the criteria for a clinical depressive disorder (Trowell et al., 2007) and a telemedicine intervention (Nelson, Barnard, & Cain, 2003).

Stice et al. (2009) conducted a meta-analytic review of depression prevention programs. These researchers identified 32 prevention programs. The average effect sizes for depressive symptoms were small for posttest ( $r = 0.15$ ) and follow-up ( $r = 0.11$ ). This study included more adolescents than children. Programs for high-risk children, females, and older adolescents had larger effects. Programs of shorter duration with assigned

homework delivered by professional interventionists were more effective than universal interventions. Interventions included problem solving, particularly social problem solving, and changing negative cognitions. Selective programs of short duration were more effective, and professional interventions rather than regular school teachers delivering the programs were more effective in the late primary and early secondary school years.

Two universal randomized controlled trials of the Aussie Optimism Program with children found modest effects. Fewer parents reported internalizing problems at posttest in a disadvantaged urban sample (Roberts et al., 2010). The teacher training and coaching condition reported lower levels of mental health problems, higher levels of pro-social behavior, and fewer clinical disorders at posttest assessments, compared to the Health Curriculum. An independent open trial of this intervention by Swannell et al. (2009) indicated that the program was most beneficial for indicated students experiencing emotional and behavioral difficulties. Rooney et al. (2006) used a younger version of AOP for children 8–10 years. The Positive Thinking Skills Program (PTS) reduced depressive symptoms, enhanced positive attributions, and lowered the prevalence of depressive disorders. Intervention group children had fewer depressive disorders at 9-month follow-up.

Luby, Lenze, and Tillman (2012) developed a preschool depression intervention, with three modules, over 14 sessions. Core modules included child-directed interaction and parent-directed interaction. Key elements were strengthening the child–parent bond by teaching, modelling and coaching of positive play techniques, giving effective commands, and handling child compliance and disruptive behavior. Mothers and fathers were invited as primary implementers. Group size from 2 to 6 families completed 2-h sessions over 12 weeks.

The aim is to reduce depressive mood, symptoms, and syndrome and reduce the incidence of childhood depressive disorders. Depressive disorders are relatively rare in childhood, and hence, depressive symptoms and risk factors such as



attribution style, coping skills, and other behavioral and interpersonal factors are used. Efforts have focused on children with known risk factors or elevated depressive symptoms, rather than primary prevention programs. Strategies include child-centered, school-based strategies targeting cognitive and interpersonal factors. Environment-centered programs, focus on family context where children of depressed parents live, plus school-based strategies are reviewed.

Early trials included working with elementary school children with mild to moderate depressive symptoms. Weisz, Thurber, Sweeney, Proffitt, and LeGagnoux (1997) implemented an 8-session intervention program aimed at enhancing primary control (changing the situation) and secondary control (changing one's interpretations). Children who received the intervention in small groups showed significantly greater reductions in depressive symptoms at posttest and 9-month follow-up than control group children. Intervention group children were more likely than control group children to move into the nonclinical range on depression measures. Weisz and Kazdin (2010) have now developed an evidence-based psychotherapy book.

Beardslee, Versage, and Gladstone (1998) focused on family factors, using cognitive therapy and psychoeducational approaches aimed at children whose parents have affective disorders. The 6–10-session family intervention helps families to develop a shared perspective of the depressive illness and to change parent's behavior toward their children. Resilience was promoted in children by providing information about the parent's illness, ways of coping, and encouraging supportive relationships outside the home. Following the intervention, parents reported significantly more changes in behavior and attitudes to their illness, compared to families that received an information-based intervention only (Beardslee et al., 1993). These effects were sustained at an 18-month follow-up, with the family-based intervention associated with more positive parent-reported and assessor-rated changes (Beardslee et al.). Family risk factors for childhood depression were reduced and prevented over time. However, no measures of

child functioning were reported, to determine if depression was prevented in the offspring.

Depression prevention in childhood has advanced significantly. Primary prevention programs for 4th-grade students are now common. Indicated programs with specific risk factors are effective in the short term. The programs are largely child-centered and school-based. A family-based program published by Beardslee et al. (1997) has shown efficacy in modifying the home environments of children at high risk, in the medium term. These indicate the efficacy of prevention strategies based upon cognitive, interpersonal, and family models of childhood depression. Current trials indicate that the incidence of depression can be reduced. Meta-analyses indicate that 22–38 % of major depression can be reduced if evidence-based interventions are applied by the health system (Munoz et al., 2012).

### Strategies That Might Work

Strategies that prevent depression in children include interventions with short-term effects and prevention strategies for problem disorders and comorbidity with depression, for example, anxiety. A number of primary prevention strategies target variables associated with depression, for example, social competence and social skills. Durlak, Weissberg, and Pachan (2010) conducted a meta-analysis with 213 interventions and found that SEL programs significantly improve children's skills, attitudes, and behaviors and reduced emotional problems, such as distress from anxiety and depression symptoms. The effect size was 0.15. These strategies have not measured depressive symptoms or disorders, but many have shown promising outcomes with proximal factors that place children at risk for depression or protect children from aversive life events. Durlak, Weissberg, Dymnicki, Taylor, and Schellinger (2011) meta-analysis found a similar impact of enhancing social and emotional learning in schools.

Strategies targeting risk such as low social competence and poor academic achievement in the early and middle childhood years show promise. However, as yet no long-term intervention



effects have been established. King and Kirschenbaum (1990) used a nine-session social skills and social problem-solving intervention, plus a parent and teacher consultation service for 4th-grade children who were at risk for depression because of poor social competence. The Primary Mental Health Project (Cowen et al., 1996) combined service program showed decreased depressive symptoms compared to the parent/teacher consultation service at posttest only, with social competencies improving for all groups.

Kellam et al. (1994) proposed that pessimistic attribution style in association with poor academic mastery leads to childhood depression. A universal school-based prevention strategy was designed to enhance mastery of academic skills in 1st-grade children. It included enriched reading curriculum and individualized correction procedures, implemented by teachers in the first year of school. Boys with high levels of depressive symptoms and good gains in reading achievement reported fewer symptoms at the end of grade 1. However, girls with high levels of depressive symptoms who made gains in reading achievement had lower levels of symptoms regardless of attending the intervention or not. These interventions targeted different mechanisms for childhood depression, by way of reducing depressive symptoms in younger children.

The Primary Mental Health Project (Cowen et al., 1996) involves the screening and identification of young children with early school adjustment problems. It then provides prompt and effective interventions services for high-risk youngsters. The program has been evaluated in numerous sites throughout the United States. One evaluation in California, where 50,000 children from 750 schools were involved, found effect sizes of between 0.37 and 0.49 for improvements in adjustment variables such as acting out, shyness, and anxiety.

### Strategies That Do Not Work

Interpersonal problem-solving strategies are not effective in reducing depressive problems when

implemented universally, although they are effective in increasing competence (Durlak & Wells, 1997). Brief classroom-based programs are not as effective as longer multiyear programs, producing stable effects on children's knowledge, attitudes, and behavior and social competence. School-based programs that are focused only on the child or the environment are less effective than those that focus on both (Durlak, 2000).

### Summary

Childhood depressive symptoms and disorders develop in the context of individual genetic and biological vulnerabilities, insecure early attachments, impaired parent-child interactions, and high levels of environmental stress. Early factors result in decreased behavioral and interpersonal skills and impairments in internal cognitive schema and information processing mechanisms. These deficits result in additional negative feedback from peers, teachers, and family members. Hence, when aversive life events are encountered, children are vulnerable to depression. Vulnerability may come from few coping skills or processes for accessing coping skills, cognitive distortions that promote helplessness, overly high standards or negative self-evaluations, or few supportive relationships; these vulnerability may subsequently lead to depression.

Prevention of depression in children includes school- and family-based interventions with known risk factors, such as elevated depressive symptoms, poor social competence, and parental affective disorder. This results in a lower risk for depression, fewer depressive symptoms, and family context changes. Effects have been maintained for up to 2 years. Interventions based upon cognitive, interpersonal, and family models of depression provide strategies to facilitate the process of change. School-based intervention programs have found depression prevention effects mediated by changes in attribution style for negative events. Other empirical strategies include school-based interventions targeting social skills and competence in

children, environment-centered strategies such as parent and teacher consultations, and enriched curriculum materials promoting academic mastery (Durlak et al., 2011). A recent meta-analysis (Munoz et al., 2012) indicated that 22–38 % of major depressive episodes are preventable. Hence, the health-care systems should provide access to evidence-based prevention for children and young adolescents.

Strategies not yet tested include universal interventions with enriched curriculum materials that promote academic mastery, for all children regardless of risk, multiyear interventions, and those that integrate child- and family-centered strategies. Interventions early in children's lives, which promote attachment, reduce the impact of maternal depression, promote positive parenting, and build social competencies and school readiness, are likely to have important impacts on child and family adjustment, hence reducing depression vulnerability. Randomized controlled efficacy trials have been completed but no replication trials or effectiveness studies to determine what strategies work in regular service delivery conditions, and there are no component analyses of the available programs. So, it is unclear which strategies are the active ingredients in preventing childhood depression. In addition, there has been only one trial of a strategy offered to all children regardless of risk status, and only one study that attempted to integrate child-centered and environment-centered approaches. These are all important areas for future research. Judy Garber asks (2008) "are we there yet?" The answer appears that we have effective programs, but these programs do not always get out to the children and adolescents who need them.

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## Drug Abuse Prevention Programs for Children

Adam E. Barry

Department of Health Education & Behavior,  
University of Florida, Gainesville, FL, USA

### Introduction

Today's youth are exposed to, and engage in, many health and safety risks including substance use, violence, unintentional injuries such as motor vehicle crashes, and risky sexual behaviors. These health risks become even more salient concerns when considering behavioral patterns are established during the transition from childhood to adulthood (Centers for Disease Control and Prevention [CDC], 2011). Thus, the choices made during this time of life have the potential to affect current and future health status. Among those choices, alcohol, tobacco, and other drug (ATOD) use are especially prominent. For instance, youth ATOD use has been linked to physical violence, unintentional injuries, illegal behaviors, as well as academic and occupational problems (Substance Abuse and Mental Health Services Administration, 1999). Moreover, adolescent substance use can have lasting impacts on brain development, negatively affecting motivation and emotional regulation (Zucker, 2006).

### Definition and Scope

The Centers for Disease Control's Youth Risk Behavior Survey (YRBS) monitors the foremost health risk behaviors (e.g., tobacco use, alcohol and other drug use, sexual risk behaviors, unhealthy dietary behaviors, and physical inactivity) contributing to death and disability among America's youth. Conducted biennially since 1991, YRBS provides nationally representative data on 9th to 12th grade students attending both public and private secondary schools throughout the United States using a three-stage, cluster

sample design. In the first stage, large-sized counties or groups of smaller adjacent counties are selected. Secondly, schools are then selected from the identified counties. In the third stage, a random sample of one or two entire classes is chosen from each school (CDC, 2004).

In regard to tobacco use, approximately 46 % have tried smoking cigarettes. Nearly 20 % of youth smoked cigarettes at least 1 day in the past month, while 9 % used smokeless tobacco products (i.e., dip, snuff, chewing tobacco) (CDC, 2010b). National smoking trends of school-aged youth between 1991 and 2009 indicate a marked drop in lifetime use of cigarettes. Specifically, approximately 46 % had ever smoked in 2009, compared to 70 % in 1991 (CDC, 2010a). An even greater percentage of youth have consumed at least one drink of alcohol in their lifetime (72 %). Approximately 24 % of students have binge drank (five or more drinks of alcohol in a row within a couple of hours), while nearly 5 % had consumed at least one alcoholic beverage on school property on at least 1 day (CDC, 2010a). While alcohol use (ever drank, binge drinking, and drinking on school campus) among American youth in grades 9–12 has steadily declined since 1991, there is currently no difference between national trends between 2007 and 2009 (CDC, 2010a). Nationally, approximately 37 % of students have used marijuana one or more times in their life, 6.4 % had used cocaine in any form (e.g., powder, crack, freebase), 6.7 % had used ecstasy, and 11.7 % had used an inhalant (i.e., sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high) (CDC, 2010a).

The Monitoring the Future (MTF) project also represents an excellent reference for tracking the ATOD use of students. Instituted in 1975, the University of Michigan's Institute for Social Research has continued to survey a large, nationally representative sample of adolescent students in 130 public and private secondary schools throughout the continental United States (Johnston, O'Malley, Bachman, & Schulenberg, 2004). Originally designed to survey a national sample of high school seniors, the project was



expanded in 1991 to include eighth and tenth grade students as well (Johnston et al., 2004). From its inception, the MTF project was designed with two unified factors: (1) yearly nationwide surveys of high school seniors and (2) recurrent follow-up surveys mailed to subsamples of each senior class cohort. Utilizing a multistage area probability sample, a representative cross section of eighth, tenth, and twelfth grade students is surveyed throughout the United States each year. Stage one involves selecting geographical areas to be used in the study. High schools are then selected from identified geographical areas. Stage three then elects students from the high schools identified in stage two. Eighth and tenth grade student questionnaires are completely anonymous, while senior respondents are asked to provide their name and mailing address on separate forms to provide a later opportunity for mailing follow-up surveys. These follow-up surveys afford investigators the ability to link individuals' longitudinal data to their senior-year information (Bachman, Johnston, & O'Malley, 2001). Content areas addressed by the MTF project include beliefs concerning personal lifestyle, school performance and satisfaction, intergroup and interpersonal attitudes, and behaviors, attitudes, and beliefs related to alcohol and other drug use (Bachman et al., 2001).

## Theories

Historically, many of the early prevention efforts aimed at preventing or offsetting adolescent ATOD use either were atheoretical, guided primarily by conventional wisdom, or lacked rigorous evaluative research (DeJong, 2007). Some previous (ineffective) paradigms common to ATOD prevention include the knowledge model (Kluger & Gallant, 2000), the social influence skill-building model (Shope, Copeland, Kamp, & Lang, 1998), and the affective model (Hansen & Graham, 1991). Current efforts, however, recognize the importance of environment in shaping individual behavior. Thus, prevention programs are recommended to

intervene at three levels: the intrapersonal, interpersonal, and community/institutional levels. Such approaches are grounded in the social-ecological perspective, recognizing that behavior is influenced by environmental and organizational factors in addition to personal factors (McLeroy, Bibeau, Steckler, & Glanz, 1988). For instance, the Higher Education Center for Alcohol and Other Drug Abuse and Violence Prevention has advocated for administrators to expand prevention programming beyond traditional education and treatment programs, focusing on the consideration and integration of the campus environment (DeJong, 2007). Consequently, it is clear that health practitioners and administrators have been encouraged to adopt approaches employing a social-ecological framework (DeJong, 2007; DeJong & Langford, 2002; Stokols, 1996). The social-ecological perspective emphasizes that (1) "behavior both affects, and is affected by, multiple levels of influence" (National Cancer Institute [NCI], 2005, p. 10) and (2) "individual behavior both shapes, and is shaped by, the social environment" (NCI, 2005, p. 10).

In addition to ecological perspectives, developmental perspectives are also driving current ATOD prevention efforts. Developmental changes can be classified into age-related segments (e.g., prenatal, early childhood, middle childhood, adolescence, emerging adulthood), developmental tasks and accomplishments (e.g., attachment, talking, learning to count, adjusting to school, engaging in rule-abiding behavior, achieving academic success, graduating from high school, achieving higher education or vocational training), levels of functioning (e.g., biological, cognitive, and social-emotional processes), or contextual changes (e.g., physical, social, societal/cultural, and media/virtual environments) (Masten, Faden, Zucker, & Spear, 2009). Several conceptual models outlining the relationship between developmental transitions and substance abuse have been proposed (Schulenberg & Maggs, 2002), including:

- The Overload Model: posits that health risks result from experiencing multiple developmental transitions within a short time period

- The Developmental Mismatch Model: posits that transitions alter the match between individuals and their contexts
- The Increased Heterogeneity Model: posits that difficult transitions amplify existing strengths and weaknesses
- The Transition Catalyst Model: posits that risk taking itself is an important component to navigating certain transitions
- The Heightened Vulnerability to Change Events Model: posits that many difficulties are relatively unpredictable, acknowledging the role of chance in altering one’s life course (Schulenberg & Maggs, 2002)

For a more extensive coverage of the key developmental themes relating to the etiology of substance use among adolescents and young adults, please see Schulenberg and Maggs (2001) and Schulenberg, Maggs, Steinman, and Zucker (2001).

## Research

In 2006, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) published a 5-year strategic plan, entitled *The NIAAA Strategic Plan for Research*. This strategic plan introduced a new organizing framework within which to examine the impact of drinking on people at different stages of development: the Lifespan Perspective (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2008). In terms of youth and adolescence, there are several areas of emphasis. These research areas include (a) exploring how social changes associated with adolescence contribute to alcohol use, (b) exploring how biological changes during adolescence impact drinking behaviors, (c) exploring how alcohol influences the brain of maturing young adults, and (d) the factors (i.e., social, familial, biological) which may increase risk of developing alcohol-related problems. Additionally, researchers continue to develop diagnoses and screening instruments for alcohol abuse/dependence, as well as refine current definitions of alcohol use/misuse (NIAAA, 2008).

## Strategies

Traditionally, the vast majority of prevention programs have been conducted in the school setting. However, prevention programs continue to expand not only in scope but also in setting. While most ATOD prevention programs continue to be conducted in the school, there are a growing number of prevention programs aimed at influencing the home setting. This expansion is logical considering “the critical role of the family is acknowledged in virtually every psychological theory of child development” (Kumpfer & Alvarado, 2003, p. 457). That said, there remains a paucity of practitioners implementing family-strengthening programs in comparison to school-based approaches (Kumpfer & Alvarado). As a result, some contend “family-based interventions are still in their infancy” (Fiese, 2005, p. 629). Many prevention programs are multimodal, incorporating numerous components and sites. To be considered family-based, interventions usually include a large family component such as home visits aimed at parental education (i.e., infant care, developmental milestones, nutrition), skills training (i.e., developing relationships and fostering cognitive and emotional growth), and/or counseling.

The National Institute on Drug Abuse (NIDA) proposes several guiding “prevention principles” (grounded in the findings of previously funded research projects) for ATOD programs (National Institute on Drug Abuse [NIDA], 2003). The following principles are common elements found among effective ATOD prevention programs:

### Risks and Protective Factors

1. Enhance protective factors (e.g., parental support) and reverse/reduce risk factors (e.g., deviant behaviors such as truancy):
  - (a) The impact of specific risk/protective factors changes with age. For instance, familial risk factors are more powerful among a younger child, while peer relationships are more powerful among adolescents.

- (b) The earlier one can intervene with risk factors, the greater possible impact and likelihood of altering a child's life course development and trajectory.
  - (c) The impact of risk/protective factors varies as a function of one's age, gender, ethnicity, culture, and/or environment.
2. Address all forms of drug abuse:
    - (a) Prevention programs should include the use of licit (alcohol and tobacco) and illicit (marijuana, cocaine, heroin) drugs, as well as the inappropriate use/abuse of prescription medicines and other legally obtained substances (inhalants).
  3. Address drug abuse issues pertinent to the local community, target modifiable risk factors, and strengthen protective factors.
  4. Tailor prevention programs to address specific risk factors among the population/audience at hand.

#### Prevention Planning: Family Programs

5. Enhance family bonding and relationships:
  - (a) Parental monitoring and supervision (e.g., rule setting, consistent discipline, rewards/praise for appropriate behavior) should be a focus.
  - (b) Parents should be knowledgeable on drug education issues (e.g., harmful effects) so family discussions can reinforce school-based learning.

#### Prevention Planning: School Programs

6. Intervene early (i.e., preschool or elementary school) to address drug abuse risk factors.
7. For elementary school children, prevention programs should target academic and social-emotional learning. Programmatic focus should be on improving the following skills:
  - (a) Self-control
  - (b) Emotional awareness
  - (c) Communication
  - (d) Social problem-solving
  - (e) Academic support
8. For middle, junior high, and/or high school students, programs should target academic (e.g., study habits and academic support) and social competence skills (e.g.,

communication, peer relationships, assertiveness, self-efficacy, and antidrug attitudes).

#### Prevention Planning: Community Programs

9. Prevention programs should target key life transition times, such as the transition from elementary to middle school, applicable to all risk populations.
10. Combine two or more modes (e.g., family- and school-based) of effective prevention programs. When used in combination, these can be more effective than a single program alone.
11. Present a consistent, community-wide message to populations through multiple settings/outlets (e.g., schools, faith-based organizations, media).

#### Prevention Program Delivery

12. When adapting research-based interventions for use in a new community, core elements should be retained, even though modifications will be needed to address unique needs, norms, and cultural requirements. Core elements are associated with:
  - (a) Structure (organization and construction)
  - (b) Content (information, skills, and strategies)
  - (c) Delivery (adaption, implementation, and evaluation)
13. Prevention programs should be long term in scope, supplemented with booster programs (repeated interventions to reinforce original prevention goals).
14. Include teacher training on good classroom management practices aimed at fostering academic motivation, school bonding, and achievement.
15. Employ interactive techniques that allow for active involvement.
16. For every dollar invested into prevention, a savings of ten dollars is realized in the treatment of substance abuse.

Readers specifically interested in evidence-based family approaches should consult reviews conducted by the National Institute of Justice's Office of Juvenile Justice and Delinquency Prevention (Alvarado & Kumpfer, 2000) and Center

for Substance Abuse Prevention (1998). Kumpfer and Alvarado (2003) summarize effective family-focused intervention approaches as follows:

1. Behavioral parent training: small groups of parents are guided through a curriculum ranging from 6 to 15 sessions by a skilled trainer.
2. Family skills training: a multicomponent approach including (a) the aforementioned behavioral parent training, (b) social and life skills training for children, and (c) practice sessions incorporating the entire family.
3. Family therapy: therapy session implemented by highly trained/licensed mental health practitioners who focus on individual family units, as opposed to a group of families.

## What Works

All of the programs presented below fall under the Institute of Medicine's (IOM, 1994) designation of "universal" target audience. In other words, these programs do not have specialized focus on any one "selective" or "indicated" population. Programs are presented based on the age group for whom they were designed.

### Elementary School

- *Caring School Community Program* (Formerly Known as the Child Development Project) (Battistich, Solomon, Watson, & Schaps, 1997; U.S. Department of Education, 2001). This family-plus-school program is designed to reduce risk factors and reinforce protective factors by focusing on strengthening students' core values, pro-social behavior, and school-wide feeling of community (i.e., school connectedness). By emphasizing a caring school environment, the program seeks to promote academic achievement and motivation while preventing delinquent behaviors like drug use, violence, and truancy. The four-component program is comprised of a mutually reinforcing set of classroom, school [(1) cross-age "buddies," (2) class meeting lessons, and (3) school-wide community building activities], and family involvement

[(4) "homeside activities"] approaches. Studies examining the effectiveness of the Caring School Community program include: Battistich, Schaps, Watson, Solomon, and Lewis (2000); Solomon, Battistich, Watson, Schaps, and Lewis (2000); Munoz and Vanderhaar (2006); Chang and Munoz (2006); and Marshall and Caldwell (2007).

- *Promoting Alternative Thinking Strategies (PATHS)* (Greenberg & Kusche, 1998). PATHS, a school-based prevention program, seeks to promote emotional health and social competencies, reduce aggression and behavior problems, and enhance the educational process. PATHS is designed to facilitate the development of self-control, emotional awareness, and interpersonal problem-solving skills. Program activities are various, including instruction, storytelling, and role-play. Curriculum is taught by classroom teachers roughly three times per week and encompasses 131 20- to 30-min sessions. Studies examining the effectiveness of PATHS include: Greenberg, Kusché, Cook, and Quamma (1995); Kam, Greenberg, and Kusché (2004); Riggs, Greenberg, Kusché, and Pentz (2006); and Domitrovich, Cortes, and Greenberg (2007).

### Middle School

- *Guiding Good Choices* (Formerly Known as Preparing for the Drug Free Years) (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999; Kosterman, Hawkins, Spoth, Haggerty, & Zhu, 1997). A drug use prevention program in which the curriculum seeks to strengthen family bonding and educate parents on how to reduce risk factors. Consisting of five 2-h skill-based sessions, parents of children ages 9–14 are taught how to (a) create age-appropriate family involvement/interaction opportunities, (b) apply consistent discipline and monitoring, (c) teach coping strategies, (d) apply conflict management/resolution approaches, and (e) enhance family bonding through positive expression of feelings. Studies examining the effectiveness of Guiding Good Choices include: Kosterman, Hawkins, Haggerty, Spoth, and

Redmond (2001); Mason, Kosterman, Hawkins, Haggerty, and Spoth (2003); Mason et al. (2007); Park et al. (2000); Spoth, Redmond, and Shin (2001); and Spoth, Redmond, Shin, and Azevedo (2004).

- *Life Skills Training Program* (Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995; Botvin, Epstein, Baker, Diaz, & Ifill-Williams, 1997; Botvin, Griffin, Paul, & Macaulay, 2003). This 3-year school-based prevention program seeks to prevent ATOD use and violence. The program's curriculum focuses on addressing both risk and protective factors by teaching personal and social skills, drug resistance skills, and normative education. First-year sessions (15 total) are followed by booster sessions in years two (10) and three (5). Major content areas include drug resistance, self-management, and general social skills. Session activities range from structured small-group activities to role-playing scenarios. Studies examining the effectiveness of the Life Skills Training Program include: Botvin, Griffin, Diaz, and Ifill-Williams (2001a, 2001b); Griffin, Botvin, Nichols, and Doyle (2003); Spoth, Randall, Trudeau, Shin, and Redmond (2008); Trudeau, Spoth, Lillehoj, Redmond, and Wickrama (2003); and Botvin, Griffin, and Nichols (2006).

#### High School

- *Project ALERT* (U.S. Department of Education, 2001). A school-based ATOD prevention program which seeks to prevent abstainers from initiating ATOD use and decrease use/abuse among those who have already initiated ATOD use. Encompassing 14 sessions (11 lessons in year one and 2 in year two), students participate in small-group activities, role-playing, and new skill rehearsals. Studies examining the effectiveness of Project ALERT include: Ellickson and Bell (1990); Ellickson, Bell, and Harrison (1993); Ellickson, Bell, and McGuigan (1993); Ellickson, Bell, Thomas, Robyn, and Zellman (1988); Ellickson, McCaffrey, Ghosh-Dastidar, and Longshore (2003); and Ghosh-Dastidar, Longshore, Ellickson, and McCaffrey (2004).

In addition to the aforementioned universal programs, there are many "selective" programs (focusing on one group, in particular) that have also been shown to be effective. For instance, the multicomponent *Adolescents Training and Learning to Avoid Steroids (ATLAS)* program (U.S. Department of Education, 2001) focuses on reducing risk factors for anabolic steroid use among high school male athletes. Moreover, ATLAS seeks to provide alternatives to performance-enhancing substance use, such as healthy sports nutrition and strength-training alternatives. Studies examining the effectiveness of ATLAS include: Goldberg et al. (2000); Goldberg, Elliot, Clarke, MacKinnon, Moe, et al. (1996); Goldberg, Elliot, Clarke, MacKinnon, Zoref, et al. 1996; and MacKinnon et al. (2001).

### What Is Promising

Programs are presented based on the age group for whom they were designed.

#### Elementary School

- *Linking the Interests of Families and Teachers* (Eddy, Reid, & Fetrow, 2000) is a 10-week program including 20 1-h sessions designed to improve overall social skills, preventing the development of aggressive and antisocial behavior. Overall, the program seeks to target the antecedents of youth delinquency and violence. The program itself is comprised of three primary elements: (1) classroom-based social and problem-solving skills, (2) playground-based behavior modification, and (3) group-delivered parent training. Sessions are held during the regular school day. Studies examining the effectiveness of Linking the Interests of Families and Teachers include: Reid, Eddy, Fetrow, and Stoolmiller (1999) and DeGarmo, Eddy, Reid, and Fetrow (2009).

#### Middle School

- *All Stars* (Hansen, 1996) is a multiyear character education school-based program focusing on (1) helping students identify how high-risk behaviors interfere with desired

lifestyle and positive ideals, (2) increasing norm of abstinence among peers, (3) building strong personal commitments to refrain from ATOD use, (4) developing greater bonding/attachment with school and family, and (5) increasing positive parental attentiveness and monitoring. The curriculum features 13 45-min weekly sessions aimed at modifying targeted mediating variables. Sessions employ activities ranging from interactive group activities, games, art projects, and small-group discussions. Studies examining the effectiveness of All Stars include: Harrington, Giles, Hoyle, Feeney, and Yungbluth (2001) and McNeal, Hansen, Harrington, and Giles (2004).

- *Lions-Quest Skills for Adolescence* (Eisen, Zellman, Massett, & Murray, 2002). This multicomponent 80-session (approximately 45 min each) life skills education program teaches cognitive-behavioral skills for building self-esteem, personal responsibility, communication, decision-making, resisting social influences, and increasing knowledge of the negative impacts of drug use. Overall, the program seeks to promote positive family, peer, school, and community commitment. Activities vary, including but not limited to guided practice, service learning, inquiry, and reflection. Studies examining the effectiveness of the Lions-Quest Skills for Adolescence include: Laird and Roden (1991); Laird (1992); and Eisen, Zellman, and Murray (2003).

#### High School

- *Teenage Health Teaching Modules* is a comprehensive school-based health curriculum composed of three primary elements which seek to engrain seven essential life skills: (1) adolescent health tasks (e.g., building positive relationships with peers, recognizing and managing feelings), (2) health content areas (e.g., ATOD use), and (3) health skills (e.g., risk assessment, decision-making, goal setting, self-management). The curriculum is an interactive, student-centered approach to health instruction encompassing 14 modules. Each module contains between

10 and 15 sessions, with each session lasting approximately 45 min. Studies examining the effectiveness of the Teenage Health Teaching Modules include: Errecart et al. (1991); Parcel et al. (1991); Ross, Gold, et al. (1991); and Ross, Luepker, et al. (1991).

Readers interested in searching for ATOD prevention programs are directed to the following two sources:

1. Substance Abuse and Mental Health Service Administration's National Registry of Evidence-based Programs and Practices (<http://www.nrepp.samsha.gov/>). The registry includes a searchable database of approximately 150 prevention and treatment programs that have been rated by independent reviewers.
2. Office of Juvenile Justice and Delinquency Prevention's Model Programs Guide (<http://www.ojjdp.gov/mpg/>). The database includes over 200 evidence-based programs spanning prevention to youth services.

#### What Does Not Work

Depending on the circumstances surrounding the implementation of an ATOD prevention program, it is possible for previously effective or promising programs to be ineffective. However, there are common program elements that consistently fail to produce a positive impact. These elements include:

- Personal accounts or testimonies
- One-time assemblies/events/speakers
- Fear-based (e.g., scare) tactics
- Strictly knowledge provision
- Affective curriculum promoting only self-esteem (Anderson, Aromaa, & Rosenbloom, 2007; De Haes, 1987; Drug Strategies, 1999)

#### Summary

As is evident among many of the effective drug abuse programs presented above (see the "What Works" and "What is Promising" sections), school connectedness represents a common



conceptual element. In fact, the Centers for Disease Control and Prevention's (CDC) Division of Adolescent and School Health (DASH) identifies focusing on school connectedness as a promising approach to addressing many health risk behaviors (CDC, 2009). DASH outlines the following specific strategies as ways to promote school connectedness (CDC, 2009, p. 9):

1. Create decision-making processes that facilitate student, family, and community engagement; academic achievement; and staff empowerment.
2. Provide education and opportunities to enable families to be actively involved in their children's academic and school life.
3. Provide students with the academic, emotional, and social skills necessary to be actively engaged in school.
4. Use effective classroom management and teaching methods to foster a positive learning environment.
5. Provide professional development and support for teachers and other school staff to enable them to meet the diverse cognitive, emotional, and social needs of children and adolescents.
6. Create trusting and caring relationships that promote open communication among administrators, teachers, staff, students, families, and communities.

As is evident from the aforementioned strategies, adult support, adolescent sense of belonging, commitment to education, and the school environment are salient issues directly influencing school connectedness. Interested readers are directed to the CDC's *School Connectedness: Strategies for Increasing Protective Factors Among Youth* (2009) for supporting action steps for six strategies listed above.

Considering school connectedness can be promoted through engaging students in open communication with teachers, staff, administrators, and peers, interactivity represents a key concern for school-based drug prevention programs. Tobler et al. (2000) distinguish interactive school-based drug prevention programs as those providing "contact and communication opportunities for the exchange of ideas among participants and encourage learning drug refusal skills"

(p. 287). As school-based drug prevention programs increase interactivity, students become less likely to use licit and illicit substances. In other words, maximizing communication among students and school officials increases the likelihood that students will be prevented from using alcohol, tobacco, and other drugs (Soole, Mazerolle, & Rombouts, 2008). Furthermore, student involvement in the delivery of a prevention program – a potential strategy for further enhancing school connectedness – is associated with improved efficacy of school-based drug prevention programs (Tobler et al., 2000). Overall, systematic meta-analyses indicate interactive (e.g., role-play, discussion, and student interaction) school-based drug prevention programs result in significant reductions in alcohol use, while noninteractive (e.g., structured, oral presentations) programs fail to significantly impact licit and/or illicit drug use (Cuijpers, 2003; Soole et al., 2008). Regardless of a drug abuse prevention program's format, structure, or elements, researchers and practitioners alike are encouraged to adopt the sentiments of *No Child Left Behind* – only use those educational programs and practices that have been proven effective through rigorous scientific support. If effective ATOD prevention programs are initiated nationwide, initiation into substance use would be delayed for an average of 2 years and decline for approximately 1.5 million youth (Miller & Hendrie, 2009).

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## Drug Use Prevention During Childhood

Nadra E. Lisha<sup>1</sup>, Pallav Pokhrel<sup>2</sup> and Steve Sussman<sup>3</sup>

<sup>1</sup>Psychiatry, University of California, San Francisco, San Francisco, CA, USA

<sup>2</sup>Cancer Prevention and Control Program, University of Hawaii Cancer Center, Honolulu, HI, USA

<sup>3</sup>Institute for Health Promotion and Disease Prevention Research, University of Southern California, Los Angeles, CA, USA

### Introduction

Alcohol, tobacco, and drug misuse in childhood poses a significant health concern. However, prevention programming and research generally do not begin until middle and high school. While substance use in childhood is low, it is possible that children begin generating intentions for future use as part of their developmental growth. Some of the factors that may influence children's substance use intentions include difficulties in social bonding skills and perceptions and lack of self-control, which can be modified through prevention programming. In addition, the prevention programming developed for adolescents is likely not directly applicable to younger cohorts. This entry reviews several theories implicated in substance use etiologies in children and adolescents. We also provide a review of the current research and highlight programs that have been shown to be effective in substance use prevention among children.

### Definitions and Scope

While research on substance use is prevalent for adolescents and older age groups, there is a dearth of research examining the use of substances in children younger than 13 years of age. Generally substance use in childhood is confined to alcohol, tobacco, marijuana, and inhalants; the use of

illicit drugs other than marijuana is presumed to be under 2 % (Johnston, O'Malley, Bachman, & Schulenberg, 2011).

Recent data show that substance use initiation among children might be taking place at an earlier age than in the past (Anderson & Moore, 2008; Johnston et al., 2011). According to Monitoring the Future survey (Johnston et al.), 36 % of eighth graders report having had tried alcohol, 20 % having had tried cigarettes, and 17 % and 11 % report having had tried marijuana and other illicit drugs, respectively. By the 12th grade, 50 % high school students are likely to have tried an illicit drug.

### Theories

Substance use and abuse result from a complex interplay between the individual and his or her environment. A number of theories have been used to explain substance use etiologies and are useful to inform prevention programming in children (Sussman & Ames, 2008). *Risk and protective factors* are one of the more simplistic ways to integrate influences on substance use. Such factors might include behavior, affect, temperament, peer group influences, genetics, sex, family setting, and community environment (Belcher & Shinitzky, 1998). These factors have been integrated into subsequent theoretical models such as the *Stage Modeling* (Flay, d'Avernas, Best, Kersell, & Ryan, 1983; Leventhal & Cleary, 1980; Sussman et al., 1995), which delineates stages of behavior such that various predictors function at different points in the history of an individual's substance use. Five stages are thought to exist; in the first stage, nonusers are exposed to risk factors; in the second stage, the individual may try a drug; in the third stage, an individual might experiment with a drug; and in the fourth and fifth stages, the individual becomes a regular user. Children at risk for initiation are at the initial stage. Thus, the goal of childhood substance use prevention strategies should be to keep children from initiating substance use.

Several notions or classes of theories have been developed (Flay et al., 1983). *Social factors*



such as early exposure to alcohol or drugs in the environment play an important role in the mechanism of alcohol and substance use initiation (Baric & Fisher, 1979). *Sociodemographic* variables such as socioeconomic status, school performance, and gender have also been found to be associated with onset of substance use (Kozlowski, 1979). In addition, certain *personality variables* such as sensation seeking and extroversion have also been associated with substance use (Martin et al., 2002). In addition, *psychosocial variables* (concerned with the interaction of internal variables such as personality traits and external variables such as social influences) have also been advanced as possible mechanisms underlying substance use (Jessor & Jessor, 1977). New evidence points to biological predispositions to substance use (Everitt & Robbins, 2005).

One of the most widely cited health behavior theories is the theory of planned behavior (Ajzen, 1985), which is an extension of the theory of reasoned action (Fishbein & Ajzen, 1975). The theory of reasoned action is grounded in various attitude and learning theories such as the expectancy-value theory, attitude-behavior theories, and attribution theory. According to the theory of reasoned action, an example application might be the following: individuals are likely to smoke cigarette if their perception of smoking is positive (attitude) and if people important to them approve of the behavior (subjective norm). In such a case, the motivation to smoke is high, which influences the intention to smoke, which in turn will lead to the actual behavior. Thus, intentions are thought to predict behavior (Ajzen, 1985; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). Ajzen (1985) introduced perceived behavioral control into TRA, thus developing the theory of planned behavior (TPB). According to TPB, perceived control over a behavior is also an important determinant of intention in addition to attitude and subjective norm.

Fourteen multivariate (cognitive-affective, social learning, commitment and attachment, intrapersonal, and comprehensive) theories were integrated to form *Triadic Influence Theory*

(Petraitis, Flay, & Miller, 1995). This theory classifies factors into three substantive domains (interpersonal, attitudinal/cultural, and intrapersonal) combined with “distances” from performance of the substance use behavior (ultimate, distal, and proximal). Specifically in the interpersonal domain, ultimate variables might include home stress, distal variables include drug use role models, and proximal variables include social-related drug beliefs. In the attitudinal/cultural domain, ultimate variables include community disorganization, distal variables include alienation, and proximal variables include expectancies of drug use benefits minus costs. Lastly, in the intrapersonal domain, ultimate variables might include biological underpinnings, distal variables include low self-esteem, and proximal variables include intentions to use substances.

## Current Research

There is relative dearth of research on substance use in childhood, possibly due to lower prevalence of substance use during this period. Research suggests that evidence-based prevention programming should emphasize childhood substance use prevention because age of initiation is a significant risk factor for continued use, dependence, and other health risks (Breslau & Peterson, 1996; Chassin, Presson, Pitts, & Sherman, 2000; Fergusson & Lynskey, 1996; Tennant & Detels, 1976) as well as subsequent problem substance use later on in life (Kandel & Davies, 1992; Kaplan, Martin, Johnson, & Robbins, 1986; Newcomb & Bentler, 1988). Findings from longitudinal studies indicate that cigarette and alcohol use at an early age was the strongest indicator of future marijuana and other substance use (Kandel, Yamaguchi, & Chen, 1992). In addition, research indicates that children at high risk for later drug abuse can be recognized at very early ages (Tarter & Hegedus, 1991). Such findings support prevention programming beginning at younger ages.

Prevention programming in childhood needs to be developmentally appropriate and target

behavioral irregularities that might be indicative of future substance use (Flay et al., 1983; Sussman & Ames, 2008). Careful considerations in program design are necessary. For example, while peer use and perceived peer use play a significant role in adolescent substance use, this does not seem to be an important predictor for children's use (Bush & Iannotti, 1992). On the other hand, young children who are without enduring supportive adults in their lives are at an increased risk of "acting out" and blaming others when they find themselves in conflict situations (Kellam et al., 1989; Shedler & Block, 1990; Sussman & Ames, 2008). These children feel that this is appropriate behavior, indicating a kind of "contextual distortion" (Sussman & Ames). Thus, prevention programming in childhood needs to be developmentally appropriate and target behavioral irregularities that might be indicative of future substance use (Flay et al., 1983; Sussman & Ames, 2008). Careful considerations in program design are necessary; for example, while peer use and perceived peer use play a significant role in adolescent substance use, this does not seem to be an important predictor for children's use (Bush & Iannotti, 1992).

As pointed out earlier, it is perhaps theoretically more valuable to assess future behavioral intentions for this age group rather than actual use (Andrews, Tildesley, Hops, Duncan, & Severson, 2003). Andrews et al. (2003) found in a school district in western Oregon that for first through seventh graders, alcohol and cigarette intentions to use were related to future trying of the substance. Because of the predictive influence of intentions on future use, it might be important to determine early intentions of use as a warning sign of future use. However, some research indicates that while children have strong convictions and often will indicate that they will never use drugs after having received prevention programming, but once children become adolescents, these types of pledges are often forgotten (Hawthorne, 1996). Future research should determine the optimal measures and constructs for evaluating substance use prevention programs in children.

## Overview of Strategies

Prevention programs can be classified by the three main *audiences* for which they are designed. *Universal* programs are designed for the most general audience, for example, the entire population of students at a school. *Selective* programs are designed to target subgroups of the population who are at risk, such as low-achieving students, children in high-risk schools, or children of substance users and abusers. *Targeted* programs are specifically designed for individuals who have already started experimenting with drugs. We identified 28 prevention programs that target children, using the following three primary sources: Colorado Blueprints, the National Registry of Effective Programs and Practices (NREPP), and the National Institute on Drug Abuse (NIDA) Redbook. In the following sections, we describe programs that have had three or more successful intervention trials as "what works"; programs with less than three successful trials, mixed results, or absence of research as "what is promising"; and lastly programs that do not fit into either of the first two categories as "what doesn't work."

## What Works

Eleven universal programs that "work" for children have been identified. The *Caring School Community Program* (formerly *Child Development Project*) is a program designed for elementary school children (kindergarten through sixth grade). This program focuses on children's sense of community towards their school as a means to increase academic motivation and to reduce substance use, violence, and delinquency. This program is effective when it is able to create an atmosphere at the school that embodies a caring environment. Long-term outcomes include reduction or elimination of alcohol (*Cohen's d* = 0.18), cigarette, and marijuana (*Cohen's d* = 0.22) use (Battistich, Schaps, Watson, Solomon, & Lewis, 2000). The program consists of three primary components: (1) an intensive

classroom component comprised by cooperative learning, reading/language arts, and develops discipline; (2) school-wide activities involving teachers, parents, and students in an effort to create a caring community at the school; and (3) activities for the family that encourage classroom-type activities in the home.

The *Classroom-Centered (CC) and Family-School Partnership (FSP) Intervention* is a program for first graders composed of two parts. The CC intervention is designed to target teachers' skills at managing behaviors (e.g., attention problems, aggressive and shy behavior). The FSP component of the intervention targets early risk behaviors by focusing on cultivating communicative relationships about behavior management strategies between parents and teachers (Ialongo, Poduska, Werthamer, & Kellam, 2001). In a randomized control trial with three classrooms – one with the CC intervention, another with the FSP intervention, and the last as a control (Storr, Ialongo, Kellam, & Anthony, 2002) – after 6 years, it was found that students who were in either the CC or FSP intervention were less likely to begin smoking (26 % versus 33 %). This program is intensive as it requires participation of school staff and teachers, as well as parents. Training for parents alone takes 60 h prior to implementation.

A third program, *Life Skills Training (LST)*, originally designed for middle school students, has now been developed for elementary school students. This program seeks to teach students skills on how to resist peer pressure, as well as competence skills for personal and social situations concerning tobacco and alcohol (Botvin, Griffin, Paul, & Macaulay, 2003). The program consists of 24 classes (30–45 min each), over a 3-year period (8 classes per year). The program provider is instructed to act more as a coach or skills trainer so as to ensure that personal, interpersonal, and social resistance skills are adequately acquired. One trial (Botvin et al., 2003) found that the prevalence rate of smoking was 61 % lower and the prevalence rate of alcohol was 25 % lower at posttest in schools that received the intervention compared to schools that did not receive the intervention.

The *Promoting Alternative Thinking Strategies (PATHS)* program, a universal classroom-based social and emotional learning program, was designed to reduce aggression and behavior problems in elementary school children. This program has existed for almost 30 years and has recently received the highest possible rating from the Blueprints Project of the Center for the Study and Prevention of Violence, University of Colorado. The program is designed to be implemented by classroom teachers two to three times per week (30 min each) for approximately 1 year. The program is based on the “ABCD” (affective/behavioral/cognitive/dynamic) model. The ABCD model incorporates features of various developmental theories including psychodynamic developmental theory, developmental social cognition, cognitive developmental theory, cognitive social-learning theory, and attachment theory. One study found greater inhibitory control and verbal fluency at 1-year follow-up in PATHS students compared to students in comparison classrooms ( $p < 0.01$ ) (Riggs, Greenberg, Kusché, & Pentz, 2006). Because the lessons are short, and the practitioner takes a naturalistic approach, the lessons appear to be easily integrated into normal classroom routines.

The *Strengthening Families Program: For Parents and Youth 10–14 (SFP 10–14)* has been found to reduce problem behaviors, delinquency, and drug abuse and to develop social capabilities and school performance in children. Originally developed in the early 1980s, this program has been replicated independently over 15 times with similar results. Parenting skills, life skills, and family skills are trained during 14 sessions designed for high-risk families. The program includes sessions for both parents and children, together and separate. The program has been shown to be associated with significantly lower substance use initiation than controls (Molgaard, Spoth, & Redmond, 2000). Different versions are available for other languages, cultures, and risk statuses. One study (Spoth, Gyll, & Day, 2002) found that 50 % of students who received the intervention reported having ever tried alcohol compared to 68 % of the control group students; 33 % of intervention group students report ever

having smoked cigarettes compared with 50 % of control group students, and only 7 % (compared to 17 % of control group students) reported having ever tried marijuana. At 4-year follow-up, the frequency of alcohol and cigarette use was lower among the intervention group than the control group ( $p < 0.05$ ). However, the effects were small in size (*Cohen's d* = 0.26 and 0.31, respectively). The program is not very labor intensive compared to others, so it should be possible to implement without too much difficulty.

The *All Stars* program targets youths from the late elementary school years until high school (ages 11–15). This program's key outcomes include increased commitment to avoid high-risk behaviors, increased bonding to school and peers, and positive changes in substance use and violence. The mechanisms that the All Stars program uses to promote these changes include creating accurate beliefs about peer norms, altering perceptions on how substance use affects lifestyles, creating commitments to stay substance free, and encouraging social and peer bonding. The program is taught by trained teachers in the school's classroom (specifically language arts, math, and science courses). Training can be completed in person or online and takes 8 h. The 33 student activity sessions are 20–30 min long. Evaluation results have consistently shown evidence for both the targeted mediating variables and substance use outcomes (Harrington, Giles, Hoyle, Feeney, & Yungbluth, 2001). When the program was delivered by a teacher, participants reported lower levels of alcohol use and inhalant use at posttest compared to students who did not receive the program ( $p < 0.05$ ). This program appears to be effective, training is minimal, and the program can be integrated into the normal curriculum; however, it is designed to be taught every year all the way through high school.

Next, *Project ALERT* was designed to be implemented in 11–14-year-olds. The strategies employed by this program included building school-wide norms against substance use, understanding social/health consequences of substance use, identifying prodrug pressure, developing resistance skills, and recognizing the benefits of being drug free. These outcomes are achieved

through online teacher training and 14 classroom sessions. Key outcomes include reduced marijuana use initiation, decreased current and heavy smoking, and reduced prodrug attitudes and beliefs and have helped smokers quit (Bell, Ellickson, & Harrison, 1993; Ellickson, Bell, & McGuigan, 1993). One large-scale evaluation found that the curriculum reduced cigarette and marijuana use initiation and current/regular cigarette and alcohol use. The rates of reductions ranged from 19 % to 39 % (Ellickson, McCaffrey, Ghosh-Dastidar, & Longshore, 2003). This program is one of the highest rated programs and appears to be relatively easy to implement.

Another program, *Keep a Clear Mind (KACM)*, is a take-home education program designed for older elementary school students and their parents. The material in the program consists of weekly sets of activities designed for parents and children to complete together for 4 weeks. The materials are based on social skills training. This intervention has been shown to positively influence known risk factors for later substance use (Werch et al., 1991). This study found that from pretest to posttest, children in the program were more likely than the comparison group to change their expectations of using cigarettes or snuff and to realize that alcohol has harmful effects ( $p < 0.05$ ). In addition, parents from the program were more likely than comparison group parents to change their expectations that their child would try alcohol, tobacco, or marijuana ( $p < 0.05$ ). This program is cost-effective and easy to implement but requires compliance and time from parents.

The *Positive Action (PA)* program is a multifaceted program designed to improve academic achievement, school attendance, and problem behaviors such as substance use. Curriculum kits are available for all ages from kindergarten through high school. Lessons last only 15 min and are scripted for the instructor (approximately 140 lessons per grade). The name of the program stems from its main unifying concept that one feels good about oneself when taking positive actions. One study found that students from intervention schools were less likely to have used

alcohol, to have been drunk, and to have tried illegal drugs than those without the intervention (Flay & Allred, 2003). One trial (Flay, Allred, & Ordway, 2001) found that middle schools with higher enrollment in this program had 52–71 % lower rates of problem behaviors such as substance use, violence, and property crime compared to schools with low enrollment in PA. This program appears to be effective but requires a considerable amount of time and is rather costly in comparison to some of the other programs available.

Another program, *Too Good for Drugs (TGFD)*, was designed for grades kindergarten through 12th. This program focuses on promoting six skills (sense of control, responsibility and self-efficacy, goal setting, decision-making, emotional management, and effective communication) in an effort to reduce intentions to use alcohol and drugs. For the K-8 curricula, there are 10 weekly, 30–60-min lessons. The program is also intended to be implemented with all school personnel (including teachers, secretaries, and janitors) who are expected to participate in a 10-h staff program. The program has shown differences from pre- to posttest on intentions to drink alcohol, smoke, and use marijuana ( $p < 0.05$ ), but long-term effects are still unclear (Bacon, 2000, 2001). This program appears to be effective but is rather costly, and to be properly implemented, it requires a commitment from the entire school staff and a long-term investment.

An additional program, *Guiding Good Choices (GGC)*, formerly known as *Preparing for the Drug-Free Years (PDFY)*, designed for parents of children aged 4–11, uses a social development strategy to build bonding, attachment, and commitment by providing opportunities, skills, and recognition of individual characteristics. This program was created to prevent teen alcohol, tobacco, and illegal substance use as well as to strengthen parenting skills and family bonding. One study found positive changes in norms against alcohol and other substance use, initiating alcohol use, alcohol use, and being drunk ( $p < 0.05$ ) (Park et al., 2000). While the program has been demonstrated to be effective and the cost-benefit analysis was positive

(Spath et al., 2002), it can be challenging both to recruit and retain parents for the 5 2-h sessions.

Six targeted and selected programs have also been identified. The *Functional Family Therapy (FFT)* is a selected program designed for families of juvenile offenders aged 6–18. This program averages 12 sessions over 3–4 months. The implementation typically takes place at both clinic and home settings; however, it can also take place in other settings such as schools, child welfare facilities, probation and parole offices, and mental health facilities. The focus of this intervention is on the risk and protective factors that impact the individual, stemming from environmental factors and how these factors present within the therapeutic process. Numerous research studies on substance use and other problem behaviors have demonstrated the efficacy of this program (Alexander & Parsons, 1973; Waldron, Slesnick, Brody, Turner, & Peterson, 2001). One report found that the 12-month felony recidivism rate for the control group was 19.2 % compared to 13.3 % in the intervention group (Barnoski & W. S. I. F. P. Policy, 2002). While this program has shown positive outcomes, most of the research has been on adolescents, the program requires involvement of the family and child, and the program is very expensive.

The *Early Risers “Skills for Success” Risk Prevention Program* focuses on improving academic ability, self-control, social skills, and involving parents in their child’s activities. This program is typically school based and requires only one family advocate for every 25–30 child/family participants. The program is somewhat intensive and requires 3–6 months for start-up (e.g., screening/recruiting children and families, obtaining school support). The first phase of the program is a 6-week summer program that is implemented 4 days per week; program components include social skills training, academic instruction, cultural education, and sports coaching. Next, the “Check and Connect Program” is implemented at the start of the school year and runs for the full school year for 2 and 3 years; here an advocate visits the child’s classroom on a weekly basis. The “Family Program” also begins at the same time; for this component,



biweekly meetings between the parent and child take place for about 2 h each. The “FLEX Family Support Program” begins 3 months into the school year and varies by family need; this portion includes home visits to the family. This program has a strong evaluation history and has been identified as an exemplary substance abuse prevention program. Evaluation studies typically had too low of substance use rates to evaluate that element of the program and instead focused on mediators of substance use. However, it might be difficult to implement, as it requires consistent parental involvement and a long time commitment. In addition, the program is yet to be evaluated for future outcomes, such as onset and continuation of substance use in high-risk populations.

The *Fast Track Prevention Trial for Conduct Problems* runs from preschool through sixth grade but is most intense during the early years, specifically for children identified in kindergarten showing problem behaviors. Parents are trained when their child is in the first grade on ways to foster academic achievement, communication with schools, controlling anger, and discipline strategies. Biweekly home visits supplement initial parent training. Children receive social skills training, academic tutoring, and a classroom intervention designed to enhance emotional awareness, self-control, and problem-solving skills, as well as activities to do at home with parents (McMahon & Canal, 1999). One study found that in high-risk group, intervention students had lower lifetime prevalence of conduct disorder than the control group participants, with the intervention group preventing more than 50 % of conduct disorder cases (Dodge & McCourt, 2010). Long-term follow-up evaluations are needed to ensure that the program indeed reduces substance use during childhood and adolescence.

Another targeted program, *I Can Problem Solve (ICPS)*, specifically designed for nursery school and kindergarten-age students, has also been successfully implemented with children in grades 5 and 6. This program is less intensive than some of the other programs as it runs for only 6–8 weeks. The program is taught in three

sections: (1) the first section focuses on using games to learn problem-solving vocabulary; (2) the second section focuses on having the children learn how to listen and to identify their feelings and those of others; and (3) the third section presents the children with hypothetical problems and they are asked to analyze these problems in regard to the feelings of those involved, to examine consequences, and to problem solve. Parents are also involved (this could be a challenge) and taught to think about their feelings, their children’s feelings, and how to help their child engage in effective problem solving. This program can be implemented within the regular class schedule, so it should not be very difficult to integrate in the curriculum. Evaluations have shown positive results. Multiple trials have shown effectiveness for behavioral adjustment ratings, impulsivity, and self-control (Shure, 1993). One evaluation demonstrated effective changes and large effect sizes (0.35–1.26) on five mediators of substance use: school bonding, parenting skills, social competence, family relationships, and behavioral self-regulation (Kumpfer, Alvarado, Tait, & Turner, 2002).

The *Brief Strategic Family Therapy (BSFT)* is a targeted program created for 6–17-year-olds who are exhibiting, or are at risk for, problem behaviors such as substance use or abuse. This program is delivered in 12–16 family sessions. BSFT operates on the principle that transforming how the family functions as a whole will help the youth who are exhibiting problem behaviors. Evaluations of the program have found reductions in marijuana use and overall substance use (Szapocznik, Hervis, & Schwartz, 2003). Studies have found greater reductions in marijuana use (Santisteban et al., 2003) and overall substance use ( $p < 0.05$ ) (Sonrisrebon et al., 1997) in program students compared to control group students. While this program has been effective in numerous trials and sessions are conducted at locations convenient to the family (such as the home), it might be difficult to implement as it requires a substantial commitment from the entire family and is very expensive.

Another targeted program is *CASASTART (Striving Together to Achieve Rewarding*



*Tomorrows, formerly known as Children at Risk*). CASASTART is a community-based, school-centered program targeting prevention of substance abuse and violence. Youths aged between 8 and 13 with a minimum of four identified risk factors are the targets of the program and remain in it for up to 2 years. Objectives include reducing drug and alcohol use, as well positive changes in other areas of behavior. The research that informed this program includes social-learning theory, social strain theory, social control theory, and positive youth development. CASASTART is operated by case managers and requires the collaboration of police departments and local social service and juvenile crime agencies. One study (Harrell, Cavanaugh, & Sridharan, 1998) found that 1 year after the program, past-month use of cigarettes, alcohol, inhalants, marijuana, psychedelics, crack, and other cocaine, heroin, or nonmedical prescription drugs was lower in the program group (51 %) compared to the control group (65 %).

## What Is Promising

The *Know Your Body (KYB) Program* is a universal program that was initially developed in the 1970s by the American Health Foundation. This comprehensive school health promotion program is designed for students in kindergarten through the ninth grade. Educational topics are broad and include topics such as exercise, safety, disease prevention, prevention of cigarette smoking, consumer health topics, dental maintenance, HIV/AIDS, substance abuse, and violence prevention. The sessions are organized across five “core skills”: self-esteem, decision-making, communication, goal setting, and stress management. Parents are sent letters and community involvement is promoted. Significant changes in cigarette smoking have been found, but no changes have been found for marijuana or alcohol (Resnicow, Cross, & Wynder, 1993). At the 6-year follow-up, the rate of cigarette smoking was 73 % less among intervention group students than among control group students. The program is promising but requires

subsequent evaluations to examine program success for other substance use behaviors.

The *Protecting You, Protecting Me (PY/PM)* program is designed for children aged 6–11. This program focuses on the importance of protecting the brains of individuals under the age of 21 from the biological effects of alcohol as well as helping children avoid the risks associated with being in a car with inebriated drivers. The program is comprised of a series of 40 lessons (20–60 min in length) from grades 1 to 5 (8 lessons each grade) covering a variety of life skills including media awareness, communication, and vehicle safety. Lessons are taught by peer educators who are trained for 2½ days. One evaluation found multiple effects in a variety of domains such as vehicle safety skills, intentions to ride with an alcohol-impaired driver, and media literacy. However, no effects were found on decision-making, stress management, and rules (Bohman et al., 2004). One study found that students in grades 1 and 2 demonstrated significantly higher increases in knowledge of dangers of underage drinking compared to the control group ( $p < 0.05$ ) (Bell, Padget, Kelley-Baker, & Rider, 2007). This program is relatively easy to implement but is designed to span over 5 years and thus requires a considerable commitment.

In addition, *Creating Lasting Family Connections (CLFC)* targets high-risk teenagers aged 11–15 and their parents. Initially, parents of teenagers attend 42–56 h of classes, and the teenagers attend 14–20 h of classes, over a 6–7-month period. Parents’ classes are divided into three modules: training on substance abuse knowledge and issues, family management skills, and communication techniques (teenagers joined for this module). Subsequently a 1-year booster (up to 6 months after the end of training) consisting of bimonthly telephone consultations and/or home visits is implemented. However, the program has been modified and now comprises more hours of instruction during a shorter period of time. Teenagers and their parents complete training for 2½ h a night for 15–18 weeks. Evidence for short-term changes in alcohol, cigarette, and other drug knowledge has been found; however, long-term changes in use have not been found

(Johnson et al., 1996). The onset was delayed for alcohol and other drugs (AOD) for youths who participated in the program for 1 year relative to controls. In addition, parents reported increased AOD knowledge and beliefs were consistent with program content ( $p < 0.05$  for alcohol,  $p < 0.05$  for AOD), and youths reported decreased conflict with their parents ( $p < 0.05$  for alcohol,  $p < 0.05$  for AOD). This program was found to have important changes in parent-child relationships; however, the lack of reductions in alcohol and substance use makes this program “promising.”

The *Seattle Social Development Project* (SSDP) is a school-based three-part intervention for teachers, students, and parents in grades 1 to 6 implemented in high-crime urban areas. Students and teachers receive mandatory training, and parents receive between 5 and 7 optional sessions per year. The Social Development Model (Hawkins & Weis, 1985) guides the interventions by training teachers to better manage their classrooms; training parents in behavior management, academic support, and skills for reducing substance use; as well as training students to problem solve and learn refusal skills. This program has been widely tested since its inception in 1981, but mixed effects have been found on substance use (Hawkins, Kosterman, Catalano, Hill, & Abbott, 2005, 2008). One study (Hawkins et al., 1992) found that after 4 years, intervention students reported lower rates of alcohol initiation (21 %) compared to control students (27 %) and delinquency initiation (46 % compared to 52 %). This program is in the “promising” category for a number of reasons. The majority of the research on this program is based on quasi-experimental designs, and the results are mixed. Another issue is the attrition for the age 21 follow-up studies. Lastly, the program has only been studied in one urban metropolitan area, and all the evaluations were conducted by the program designers rather than outside evaluators.

The universal program, *Project Venture*, was designed for fifth to eighth grade American Indian youths. This program aims to develop social and emotional competence to enable youths to resist alcohol, tobacco, and other

substance use. The program curriculum is based on traditional American Indian values. The program consists of 20 1-h classroom-based activities; weekly after-school, weekend, and summer skill-building and challenge activities (e.g., hiking, camping); 3–10 days of summer camps and wilderness treks; as well as community-oriented service learning and service projects throughout the year. The results have been mixed. One study (Carter, 2005) found that both intervention and control students increased in alcohol use from baseline but that a leveling off occurred for intervention students ( $p < 0.05$ ). This difference represents a large effect size (*partial eta-squared* = 0.189). A second study found similar results; alcohol use remained the same for the intervention group but increased for control subjects ( $p < 0.05$ ) (Carter, Straits, & Hall, 2007). Effect sizes were large for marijuana (*partial eta-squared* = 0.162) and medium for other illicit drugs (*partial eta-squared* = 0.097). Both studies found that use of marijuana and other illicit substances remained the same among students in the intervention group but increased among students in the control group. Thus, this program is promising, but results are mixed and the intervention is intensive.

The *Linking the Interests of Families and Teachers* (LIFT) is a targeted program that is promising for grades 1 through 5. This 1-h, twice a week, 10-week program is designed to decrease delinquent behaviors while promoting positive development in at-risk youths by improving social skills for participants (classroom and playground components) and providing parent training. One study found that compared to control youths, LIFT participants exhibited a reduced average level of use of tobacco, alcohol, and illicit drugs through 12th grade (DeGarmo, Eddy, Reid, & Fetrow, 2009). At 3-year post-program, lower levels of alcohol and marijuana use were found among program participants compared to control subjects ( $p < 0.05$ ) (Eddy, Reid, & Fetrow, 2000).

Another program, *Preventive Treatment Program* (PTP), is a targeted program for boys aged 7–9 who exhibit problem behaviors in kindergarten. One aspect of the program includes

a 17-session training for parents on how to monitor behavior, how to reinforce pro-social behaviors, how to use punishment, and how to deal with crises. The second component teaches the boys social skills and self-control in a 19-session program. The training is implemented in small groups comprised of both disruptive and nondisruptive boys; it employs coaching, peer modeling, self-instruction, reinforcement contingency, and role playing to build skills. The program has shown effects at age 15 such that the intervention boys were less likely than the control boys to report having been drunk or taken drugs in the last 12 months ( $p < 0.05$ ) (Tremblay, Masse, Pagani, & Vitaro, 1996).

Two selective programs were identified as potentially effective programs. *Coping Power* is a multicomponent parent and child program designed for late elementary school through middle school. This 15–18-month school-based program was created to educate children on how to cope with anxiety and anger, social competence, self-regulation, problem solving, and positive parental involvement. The program consists of 34 group sessions as well as periodic individual sessions. In addition, parents receive 16 group sessions as well as individual contacts and home sessions. There is also a shorter abbreviated version of the program currently being evaluated. Evaluations of this program have found mixed effects on substance use (Lochman & Wells, 2004). One evaluation showed no program effect on boy's self-reported substance use but did on parent-reported substance use ( $p < 0.05$ ). As this program is rather intense to implement, more evaluations on substance use outcomes are needed.

In addition, the well-known *Big Brothers Big Sisters of America (BBBSA)* program is a selected program designed for at-risk youths aged 6–18. Non-related mentors are matched with children to promote positive development and social responsibility. In the traditional model, the mentor is expected to spend approximately 3–5 h per week with the child for 1 year. Some of the newer BBBS programs operate slightly differently such that the focus is on establishing school-based mentoring programs where students interact during school hours with their mentor. The

contact between the mentor and the child takes place at the school in this model. The program has been shown to be effective on initiation of alcohol and illegal drugs (Tierney & Grossman, 1995). Program effects of the new model on substance use are not yet “proven.”

### What Does Not Work

The *Drug and Alcohol Resistance Education (DARE)* is known to be ineffective in both short- and long-term reduction of substance use among students (Peterson, Kealey, Mann, Marek, & Sarason, 2000; Resnicow & Botvin, 1993). However, even with the knowledge of this program's lack of substantiation, DARE is still being implemented in some elementary schools across the country. Other ineffective programs that have been used throughout the years include “Here's Looking at You 2000 and McGruff's Drug Prevention and Child Protection” (Hallfors & Godette, 2002; Pankratz & Hallfors, 2004). However, there may be more ineffective programs as those that do not work typically remain unpublished in evaluation studies and thus can be difficult to locate.

It must be noted that the lack of long-term outcomes makes childhood substance use prevention difficult to evaluate. While many of the programs have been evaluated in terms of mediators of substance use such as self-control and problem solving, few have been evaluated with regard to actual substance use behaviors. It is possible that without proper booster programs in later grades, the prevention effects will deteriorate over time (Peterson et al., 1992). As the substance use effects of early prevention programming over the long term appear to be minimal (Peterson et al., 2000), it is crucial that programs be maintained and extended throughout middle school and high school years.

### Summary

It appears that prevention scientists are progressively creating and evaluating developmentally

appropriate interventions for youths of all ages and risk levels. However, younger aged children have often been overlooked for substance use prevention. There are two main reasons that prevention efforts need to focus on children. First, substance use intentions begin to take shape early in childhood (Andrews et al., 2003) and even young children are at risk for initiation. Second, early initiation has been associated with greater substance abuse dependence and problems in later life. Fortunately, promising programs appear to be emerging. Many of these programs include parents, schools, and communities and target high-risk youths. Currently, there is a growing acknowledgement of the need to create and implement developmentally appropriate interventions for children. However, there is still a lack of longitudinal research on the effects of the current programs.

Future research might consider neurobiology or genetic approaches to inform prevention programming. The development and maintenance of various addictions have been linked to specific neurobiological underpinnings (Everitt & Robbins, 2005; Martin-Soelch, Linthicum, & Ernst, 2007; Volkow, Fowler, & Wang, 2004). Developing research on the addiction process operates with the understanding that a drug or behavior gains saliency through reinforcement, followed by transitions into habitual or compulsive involvement through reward-based learning processes (Martin-Soelch et al., 2007). It is possible that genes play a fundamental role in the addiction process by determining foundational vulnerabilities for standard behavioral processes to go awry. New studies on the neurobiology of impulsivity and impulse control disorders suggest parallels with drug addictions (Lobo & Kennedy, 2006). A relatively new concept, that of "endophenotypes," might provide valuable insights into the etiology of substance use disorders (Brewer & Potenza, 2008). Endophenotypes are "measurable components unseen by the unaided eye" and may be neuropsychological, endocrinological, cognitive, neuroanatomical, or biochemical. Through the identification of endophenotypes, it might be possible to identify genetic predispositions to addiction at a younger

age and tailor prevention efforts more specifically as well as enhance behavioral and pharmacological treatments.

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## Health and Fitness During Childhood

Matthew Lee Smith<sup>1</sup>, Jeff M. Housman<sup>2</sup>,  
Lauren A. Shinholster<sup>3</sup>, Justin B. Dickerson<sup>4</sup> and  
Kelly L. Wilson<sup>5</sup>

<sup>1</sup>Department of Health Promotion and Behavior,  
College of Public Health, The University of  
Georgia, Athens, GA, USA

<sup>2</sup>Department of Health and Human Performance,  
Texas State University, San Marcos, TX, USA

<sup>3</sup>Department of Health Promotion and Behavior,  
The University of Georgia, Athens, GA, USA

<sup>4</sup>Pulmonary Division, Intermountain Healthcare,  
Murray, UT, USA

<sup>5</sup>Department of Health and Kinesiology, Texas  
A&M University, College Station, TX, USA

### Introduction

Physical health and fitness are often discussed in terms of physical activity (PA) and sedentary behaviors. While a multitude of factors influence physical health among children including immunizations, social relationships and contexts, traffic safety, and risk-taking behaviors such as substance use or sexual activity, this entry will hone its focus on evidence and content related to PA (also referred to as fitness or exercise). Regular PA in childhood is known to improve strength and endurance, build healthy bones and muscles, control weight, reduce anxiety and stress, and increase self-esteem (U.S. Department of Health and Human Services [U.S. DHHS], 2008). Physical activity is also acknowledged to protect against, prevent, and/or delay the onset of chronic conditions including high cholesterol, high blood pressure, type 2 diabetes, heart disease, and some cancers (U.S. DHHS, 2008). Children's consistent involvement in aerobic, muscle-strengthening, and bone-strengthening activities is important for overall health benefits; however, these benefits transcend mere physical health and can positively influence cognitive functioning, concentration (Budde, Voelcker-Rehage, Pietraßyk-Kendziorra, Ribeiro, & Tidow, 2008), and classroom performance (Dwyer, Blizzard, & Dean, 1996).

Alongside the surge of childhood obesity in the United States over recent years, a wealth of PA and weight reduction interventions have been developed, delivered, and evaluated. While the effectiveness of such interventions varies substantially, common characteristics and underlying threads exist, which distinguish successful evidence-based programs from those with less health impact. Among these elements of success are (1) incorporating recommendations from authoritative governing body (e.g., the Community Preventive Services Task Force, Council on Physical Education for Children [COPEC] of the National Association for Sport and Physical Education), (2) employing age-appropriate physical activities, (3) focusing on specific PA behaviors, (4) integrating social and/or familial support, (5) involving skill building and exercise self-efficacy activities, and (6) addressing multiple levels of influences on children's participation in PA. Due to the complex nature of exercise behavior and the diverse set of related determinants, characteristics of successful PA interventions for children address multilevel influences (e.g., individual, interpersonal, organizational, policy), highlight the importance of involving a variety of influential people (e.g., parents, siblings, school personnel, religious leaders), and present opportunities for PA in a variety of settings (e.g., school, community, clinical).

### Definitions and Scope

Understanding the current levels of PA and inactivity among children is critical for defining the extent of the problem and guiding public health efforts. The US Department of Health and Human Services recommends that young people ages 6–17 years participate in at least 60 min of moderate-to-vigorous physical activity (MVPA) daily (U.S. DHHS, 2008).

Physical activity (PA) is defined as any bodily movement produced by skeletal muscles that require energy expenditure (World Health Organization [WHO], 2012). Intensity of PA is measured in Metabolic Equivalents (METs) – or the energy cost of sitting quietly – and is equivalent

to a caloric consumption of 1 kcal/kg/h. Moderate-intensity physical activity (MPA) requires 3–6 times more energy than sitting; therefore, MPA is defined as an activity that requires 3–6 METS and includes activities such as brisk walking, dancing, and domestic chores. Vigorous-intensity physical activity (VPA) is defined as activity that requires more than 6 METS and includes activities such as running, aerobics, and competitive sports (WHO, 2012).

Reports about PA participation among young people consistently demonstrate that most children in the United States do not meet PA recommendations. In 2009, only 18 % of high school students had participated in at least 60 min of daily MVPA, only 33 % attended physical education (PE) class daily, and only 56 % attended PE at least once a week (Centers for Disease Control, 2009).

## Theories

Theoretical frameworks provide an avenue to explore determinants of PA among children. Although theories used to explore motivation to be physically active have historically placed emphasis on individual-level determinants (e.g., attitudes, perceived susceptibility, self-efficacy, subjective normative beliefs), current theoretical investigations often include additional constructs that account for interpersonal, environmental, and social system and structure influences. This change in focus indicates a paradigm shift and provides us with a broader understanding of factors associated with children's motivation(s) to participate in PA.

### Individual-Level Theories and Determinants

A large number of research studies and programs/interventions investigating determinants of PA among children have included theoretical constructs drawn from the Health Belief Model (HBM), Social Learning Theory (SLT), social cognitive theory (SCT), and the Theory of Planned Behavior (TPB). For example, a variety of studies have examined relationships such as children's perceived susceptibility to disease

from not participating in PA, attitudes towards performing PA, subjective normative beliefs about performing PA, and self-efficacy to perform PA. Studies investigating these PA determinants among children have yielded relatively small correlations between children's perceptions of susceptibility and subjective normative beliefs. Conversely, children's attitudes about and perceived self-efficacy to perform PA have been significantly related to children's participation in PA; self-efficacy to perform PA most frequently being identified as the most important determinant for engaging in PA.

### Social, Ecological, and Structural Theories and Determinants

Social, ecological, and structural theories go a step beyond individual-level theories by postulating factors extraneous to the individual also impact behavior. That is, an individual's immediate and extended environments (or social systems) have the potential to influence lifestyle choices and behavior. The most commonly cited social, ecological, and structural theories used to investigate determinants of PA among children include SCT (Bandura, 1986), Social Ecological Model (Stokols, 1992; Stokols, Grzywacz, McMahan, & Phillips, 2003), Organizational Change Theory (Kaluzny & Hernandez, 1998), and Structural Ecological Theory (Cohen, Schribner, & Farley, 2000).

Social cognitive theory hypothesizes a constant interaction between personal factors (e.g., attitudes, knowledge, skills), the environment, and behavior. Bandura (1986) labeled this interaction triadic reciprocal determinism and proposed that an individual's environment impacts behavior and an individual's behavior simultaneously impacts their environment. Stated another way, a person is a product of their environment, yet their actions shape the environment in which they reside.

Social and Structural Ecological Models hypothesize that social systems and structural elements influence behavior by interacting with intrapersonal factors. Social Ecological Models focus on population-level health behavior and have four primary principles: (a) health behaviors

are influenced by factors at multiple levels of influence (i.e., intrapersonal, social systems, behavior setting, and policy); (b) behavioral influences interact across multiple levels; (c) behavior change occurs best when interventions address multiple levels of influence; and (d) behavior-specific interventions are most effective (Stokols, 1992). Structural Ecological Models (Cohen et al., 2000) hypothesize that health behavior is influenced by four structural-level categories: (a) availability of protective products (e.g., condoms, vegetables) or harmful consumer products (e.g., tobacco, high-fat foods, firearms), (b) physical structures (e.g., consumer products, buildings, physical neighborhood layout), (c) social structures (i.e., laws of policies that require or prohibit behavior), and (d) media and cultural messages (e.g., frequently heard messages through media, stories, cultural practices). Additionally, concepts operationalized within theories of organizational change include organization-level policies and practices (e.g., school that require physical education or offer healthy foods at lunch) and an organizations ability to embrace change needed to successfully reach their short- and long-term goals and objectives. These organization-based theoretical concepts have been used to explain behavior change and – which are also commonly included in many Social and Structural Ecological Models.

## Current Research

Determinants of PA are multidimensional and often interact across numerous levels of influence. Many researchers have attempted to understand interactions between individual factors (e.g., attitude, self-efficacy), interpersonal factors (e.g., peer influence, parent-child relationships), ecological factors (e.g., social systems, policies), and PA behavior. Findings from such investigations serve as the foundation and evidence to inform effective programs to initiate, increase, and sustain PA among children. The effectiveness of PA programs such as Coordinated Approach to Child Health (CATCH), Trial of Activity for Adolescent Girls (TAAG), and

Sports, Play, and Active Recreation for Kids (SPARK) has been well documented through various research methodologies. Results from these intervention-driven studies indicate the efficacy of these PA programs to effect PA levels among children.

## Determinants of Physical Activity

Investigations seeking to identify determinants of PA among children indicate several intrapersonal factors that influence PA among children. In a comprehensive review of PA literature from 1999 to 2006, evidence strongly supported that attitude, self-efficacy, and goal orientation/motivation were significant intrapersonal predictors of PA among children (Van Der Horst, Paw, Twisk, & Van Mechelen, 2007). Additionally, perceived self-efficacy to perform PA, perceived barriers to PA, perceived control over PA, perceived social support related to PA, and child interest in PA have also been identified as important antecedents to children's PA behavior (Biddle & Mutrie, 2008; Dishman, Dunn, Sallis, Vandenberg, & Pratt, 2010; King et al., 2011; Trost, Kerr, Ward, & Pate, 2001).

Interpersonal and environmental factors can also greatly influence PA among children. In a systematic review of PA interventions, the most commonly identified interpersonal and environmental determinants of PA among children were social support from friends, peers, and family and access to facilities, open spaces, and parks (Biddle & Mutrie, 2008). Neighborhood social characteristics, neighbors' willingness to "watch out" for others' children, safe transportation, and proximity to places of interest have also been identified as important determinants of PA among children (Evenson, Murray, Birnbaum, & Cohen, 2010; Franzini et al., 2009; Van der Horst et al., 2007). For example, environmental factors hindering children's ability to engage in PA include crime, poor sidewalk quality (or absence thereof), inadequate street lighting, unleashed dogs, and the lack of green space. While it remains important to understand the factors influencing PA among children, it is equally if not more important to recognize the existing and precursory factors that contextualize the child's

environment, which shapes their opportunities and barriers to engage in PA.

### School-Based Programs

Rigorous evaluation research of programs such as CATCH and SPARK provide strong evidence that multidimensional programs can significantly impact moderate to vigorous physical activity (MVPA) among children. CATCH and SPARK are examples of broad programs that address a wide range of PA determinants. Both CATCH and SPARK contain individual, family, community, and school-based components, and both programs attempt to improve multiple antecedents to PA among children including knowledge, skill development, self-efficacy for PA, and several others.

Using a pre- and posttest control group design, Sallis and colleagues (1997) investigated the influence of the SPARK program on MVPA among elementary-aged children. On average, students in the intervention group led by PA specialists participated in 16 more minutes of MVPA a week relative to their counterparts in the control groups. Furthermore, students in intervention groups led by teachers participated in 13 more minutes of MVPA compared to those in control groups. Other researchers reported students in schools using SPARK were five times more likely to participate in 30 or more minutes of PA per day during their physical education classes relative to students in schools where SPARK was not implemented (Dowda, Sallis, McKenzie, Rosengard, & Kohl III, 2005). Similarly, other studies investigating the CATCH program reported that students in intervention groups participated in significantly more MVPA compared to those students in control group (i.e., 58.6 min per day compared to 45 min per day, respectively) (Luepker et al., 1996). In addition to increased PA, students who participated in CATCH interventions also increased fruit and vegetable consumption and experienced higher levels of weight loss.

Two other interventions, Take 10! and PLAY, integrate short bouts of exercise into existing classroom curricula. Take 10! encourages students to perform 10 min of PA at a time during

academic activities such as reviewing class material and has been shown to increase participation in PA among children (Stewart, Dennison, Kohl, & Doyle, 2004). Using a similar approach, PLAY incorporates 15-min exercise breaks during existing curricula to increase the likelihood of students attaining 30 min of MVPA each day. Initial evaluations indicate PLAY successfully increases MVPA among children who participate.

### Programs for Specific Populations

Although many programs have been developed for grand-scale dissemination within diverse populations, communities, and settings, other programs have been specifically tailored to address the unique needs and characteristics of certain populations. For example, programs including TAAG, New Moves, and LEAP were specifically created to increase PA among middle and high school girls. In a 3-year nationwide study of 36 schools implementing TAAG, eighth grade females enrolled in the intervention showed significant PA improvements relative to females in schools without the intervention (Webber et al., 2008). Furthermore, intervention group participants had significantly higher PA levels on weekend days and significantly less sedentary minutes compared those in the control group participants. Similarly, New Moves, a program designed to address psychosocial variables and PA among overweight high school girls, has been shown to effectively increase PA among participants and improve antecedents to behavior (e.g., self-efficacy to perform PA). LEAP incorporates school, community, family, and health service components to increase PA among high school girls. Initial evaluations report that LEAP increases daily PA and that participants' PA level was mediated by girls' enjoyment of PA and self-efficacy to perform PA (Motl et al., 2002).

Many other PA programs have been tailored for specific populations. For example, several programs have been developed to increase PA or MVPA among African American females ages 8–12 years. The Georgia FitKid Project is a 5-day-a-week PA program that engages

participants in 80 min of MVPA per day within a school setting. Three-year evaluation results showed an increase in MVPA and fitness as well as reduced adiposity. Another intervention, Pathways, was created to increase PA among American Indians in grades three through five. Grounded in SCT, Pathways uses family, nutrition, and PA to prevent obesity and other associated health problems. The PA component of the program incorporated principles from SPARK and has initially shown minimal effects on PA levels among American Indian participants.

### Meta-Analyses and Reviews

Over the past decade, several systematic and meta-analytic reviews of the scholarly literature have been conducted to determine the overall effectiveness of PA programs for children. Using metabolic equivalent of task (MET) as a measure of PA, Beets, Beighle, Erwin, and Huberty (2009) performed a meta-analysis of after-school programs aimed at increasing PA in children. Results of this review indicated that three interventions (i.e., a gardening program, a Canadian sports program, and the Georgia FitKid Project) were most effective to increase children's PA levels. Other systematic reviews of PA programs for children have identified CATCH, SPARK, TAAG, and Take10! as having short- and long-term influences on PA levels among participating children (Camacho-Miñano, LaVoi, & Barr-Anderson, 2011; Heath & Coleman, 2002; Pate & O'Neill, 2009; Van Der Horst, Paw, Twisk, & Van Mechelen, 2007).

### Strategies

Thorough and rigorous studies have been integral to assist school and health professionals to identify characteristics of effective interventions with potential to increase PA levels among children. When examined collectively, individual studies, meta-analytic studies, and systematic reviews of PA-related research have recognized common essential components of interventions that make them successful for raising

activity levels among youth. Identified criteria include that interventions be (a) comprehensive and multidimensional (e.g., CATCH, SPARK, TAAG), (b) grounded in robust theories (i.e., SCT and Social or Structural Ecological Models), and (c) address multiple determinants of PA. Interventions that incorporate short bouts of exercise into existing class structures (e.g., Take10! and PLAY) also appear to increase PA among children; however, the effectiveness of these programs to alter fitness levels and adiposity have not been tested.

Five comprehensive reviews and two meta-analyses of PA interventions conducted between 2000 and 2012 detected significant increases in PA for 47–100 % of interventions evaluated, with the most effective interventions containing school, community, and family components (Dobbins, De Corby, Robeson, Husson, & Tirilis, 2009; De Meester, van Lenthe, Spittaels, Lien, & De Bourdeaudhuij, 2009; Kriemler et al., 2011; Salmon, Booth, Phongsavan, Murphy, & Timperio, 2007; van Sluijs, 2011). It seems clear that implementing PA interventions in a variety of settings and targeting diverse life dimensions are most effective to modify behavior. As such, the most effective PA interventions and strategies to change PA behavior among children address multiple influences including intrapersonal (e.g., attitude, self-efficacy), interpersonal (e.g., peer and family influence), and environmental (e.g., physical structures, policies) factors. Findings from PA research highlight several themes related to successful intervention strategies: (a) developing multidimensional programs that address a variety of PA determinants are most effective (as indicated previously); (b) including PA specialists in PE classes or recreational activities is associated with positive interventions effects; (c) delivering multicomponent programs that focus exclusively on PA (rather than multiple behaviors) have the greatest intervention effect; (d) delivering programs with an emphasis on PE result in greater PA levels among children; and (e) involving children and the children's family increases the effectiveness of interventions attempting to modify PA levels.



## What Works

Current research suggests the existence of effective interventions that promote PA among children. However, to fully understand the effectiveness of PA interventions among this population, criteria for what serves as “evidence” and those programs considered to be “evidence-based” must first be defined. For the purposes of this entry, successful interventions were defined as interventions having three or more trials that resulted in empirical evidence of increased PA among children. As such, no intervention met that criterion.

## What Is Promising

There are several interventions that merit further research but currently provide insufficient evidence about their effectiveness to promote PA among children. Many of these strategies have produced inconsistent findings or have been applied to other target populations. While these strategies show promise, the mixed set of findings make their effectiveness inconclusive. Cross-cutting themes of interventions with mixed reviews included programs using knowledge-based curricula, short-term efforts (i.e., program less than 6 months in duration), and programs targeting children between the ages of 6 and 11 (especially those who were not obese) (Hadley, Hair, & Dreisbach, 2010). More specifically, interventions that mandate PA were not conclusively deemed effective, thus reinforcing the need for activity variety and the incorporation of both structure and nonstructured exercise formats.

For the purposes of this entry, evidences of what is promising in terms of interventions to increase PA among children are those efforts/initiatives that have (1) been rigorously tested with documented success, (2) been published in the peer-reviewed literature or supported by a credible governing body, and (3) a history of replicability. As such, evidence-based interventions contain common elements of a specific-target population; specific measurable goals;

well-defined program structure and timeframes; specification about staffing; training, facilities, and equipment; and an established program evaluation to identify success. With these criteria in mind, it is also important to consider that our examination of the multiple determinants of PA is only useful if knowledge and comprehension is translated into practice. Understanding these determinants facilitates the development of effective interventions to not only increase PA but also maintain this behavior. Therefore, we must consider issues of available resources and the feasibility/reality that such evidence-based interventions can be delivered with fidelity.

A recent review of the literature has identified general characteristics of successful interventions to increase MVPA among children (Hadley et al., 2010). In this review, cross-cutting themes deemed to be effective included programs that purposively targeted efforts to overweight or obese children (i.e., change is more difficult to detect among those of normal weight or those who are already physically active), contained a narrow set of goals specific to the desired behavioral outcome (i.e., focusing on PA rather than focusing on multiple behaviors like diet and weight loss simultaneously), and incorporated a counseling or therapy component for the participant and/or their family to provide additional assistance to meet behavioral objectives. More specifically, effective programs were longer in duration (rather than a brief intervention or one-time delivery), tracked participants progress over time (strong evaluation component), and included skill-building competencies (rather than mere education).

## School-Based Physical Education Interventions

Schools play a critical role in shifting children’s sedentary behaviors to a more active and fit lifestyles. Children spend nearly 7 h of their day at school, which makes these institutions an appropriate setting for PA interventions (Ward, Saunders, & Pate, 2007). School-based interventions have been shown to increase the number of minutes engaged in MVPA, mostly attributed to increasing the percentage of class time dedicated

to activities involving this level of activity (Ward et al., 2007). Common elements of successful school-based interventions are the incorporation and enhancement of school-based physical education, improved health education and nutrition curriculum, and increased levels of social and familial support (although not always implemented simultaneously) (Kahn et al., 2002). While these elements are especially important to the initiation of PA behaviors, program deliverers must also consider the maintenance of such behaviors. To sustain PA levels among children, programs should promote a variety of enjoyable physical activities (to maintain participant interest) that are age appropriate. Examples of school-based programs with documented success to increase PA include CATCH (Kelder et al., 2005), Take 10! (Stewart, Dennison, Kohl, & Doyle, 2004), PLAY (Pangrazi, Beighle, Vehige, & Vack, 2003), and SPARK (Sallis et al., 1997).

The effectiveness of a school-based intervention is often enhanced when considered within the context of the Coordinated School Health Approach (Allensworth, Lawson, Nicholson, & Wyche, 1997; Marx & Northrop, 1998). This means the intervention transcends merely physical education and encompasses other aspects of school health including nutrition, psychological services, and the built environment. Specific to physical education, programmatic characteristics associated with positive outcomes include assurances that adequate time is allotted for PA (i.e., the actual time for PA can be easily squandered because traditional physical education periods may be 50 min in length, this includes time to change into gym clothes, discuss rules and activities, warm-up, cool down, and dress back into school clothes) and class sizes are reasonable for the proposed activity (i.e., classes that are too small may not afford enough activity or interaction, whereas groups that are too large may cause coordination difficulties and the need to host multiple independent activities) (San Diego State University, 2007). Additionally, school-based interventions to promote PA should include competitive and noncompetitive activities, structured and unstructured activities, and

time for activities throughout the day (i.e., before, during, and after school) (Ribeiro et al., 2010). Examples of before and after school interventions that have been shown to improve PA include walking/biking programs to and from school (e.g., Safe Routes to School program, Waling School Buses, Walking to School Days), which are well supported by school policy, staff, parents, and others.

### **Individually Adapted Interventions**

Individually adapted interventions focus on the incorporation of PA into daily routines and tailoring programs to meet the specific needs and interests of each individual (Kahn et al., 2002). Common elements of effective individually adapted interventions include an increased focus on goal setting, building social support, behavioral reinforcement, problem solving, and relapse prevention for sedentary behavior. Individually-adapted interventions are appropriate for various settings including schools and communities (Kahn et al.). Multicomponent programs like SPARK typically include individually tailored features such as self-management and “homeplay” activities completed by the child and their parents. While shown to be effective, considerable resources are often needed to offer individually tailored interventions. For many settings and budgets, these types of approaches may not be feasible or cost efficient.

### **Policies, Systems, and the Built Environment**

Incorporating policies that facilitate PA has been an effective method for increasing PA levels among children. Furthermore, utilizing systems that encourage participation across all ability levels, and reducing the impact of barriers to PA, are known to increase daily PA within this population. Findings from existing research indicate that daily PA among children can be increased by (1) developing and implementing policies that increase access to and use of footpaths, bikeways, and other forms of manual transportation, rather than motorized vehicles (Pucher, Dill, & Handy, 2010); (2) providing safe, accessible places for people to be involved in recreation, exercise, sports, walking, and cycling; and

(3) utilizing sports systems and programs that promote “Sport for All” policies and programs (Australian Local Government Association et al., 2010; WHO, 2002). Building upon the universal appeal of sport, a comprehensive sport system should be implemented that includes the adaptation of sports to provide a range of activities to match the interests of girls and boys of all ages, in addition to well-coordinated coaching and training opportunities.

### **Community and Public Education**

Public education remains an essential component of interventions aimed at increasing PA. For example, utilizing mass media can raise awareness and change perceptions of social normative behavior related to PA. This may include print, audio, and electronic media; outdoor billboards and posters; public relations; point of decision prompts; mass participation events; mass distribution of information; and newer forms of media such as text messaging and social networking. Although mass media has the ability to reach a large portion of the population, information-only educational interventions are generally not effective. Well-designed community-based educational programs can help children utilize information received from mass media to identify resources, build self-efficacy, and develop skills necessary to perform recommended levels of daily PA. Effective community-based educational interventions should involve multiple settings and sectors that appropriately and synergistically integrate engagement and resources.

### **Classroom-Based Health Education**

Unlike school-based physical education interventions, classroom-based interventions to reduce television viewing and video game playing have produced inconsistent findings. The average child spends nearly 6 h per day exposed to some form of media (Ward et al., 2007). Research indicates that media (primarily television) leads to PA displacement PA, reduced resting metabolism, and increased calorie consumption during television viewing time (Robinson, 2001). With children spending nearly as much time watching

television, as they do in the classroom, it seems plausible to design classroom-based interventions to reduce television viewing. Studies show that interventions targeting television and video game reduction show a consistent decrease in the viewing activities of children (Kahn et al., 2002). According to the Community Guide, classroom-based health interventions also decreased the amount of time spent in other sedentary behavior. However, what is poorly understood is if these reductions in television viewing and video game playing correspond to increased levels of PA. A randomized control trial showed that each hour of reduced television viewing resulted in reduced obesity prevalence for girl participants (Gortmaker et al., 1999). Similar studies have found weak and variable associations in this form of intervention.

### **Social Support Interventions in the Community**

Communities provide opportunities to engage in PA outside the confinements of school and home. Involvement in recreational sports, youth service organizations, and religious organizations provides children with opportunities to be physically active and social (Ward et al., 2007). Community-based settings are invaluable for PA because they are accessible on the weekends, in the summer, and after school (Ward et al.). However, many barriers to participation in community-based programs exist. Cost, transportation, and perceived safety can influence the decision to engage in available community activities (also consider some communities have limited community program offerings) (Ward et al.). A child’s social environment can influence their exercise behavior; however, recent research suggests the effectiveness of community-based social support interventions only exists for adults. Social support interventions increase PA through building, strengthening, and maintaining social networks (Kahn et al., 2002). Successful interventions typically involve the buddy system or peer groups. Due to the success of these strategies among diverse groups of adults, it seems promising that these interventions can be effectively adapted to target children.

## What Does Not Work

As previously indicated, interventions that were too broad in scope (i.e., address multiple behaviors simultaneously) and targeted only one determinant of physical inactivity were deemed ineffective. Further, knowledge-based approaches are insufficient enough to increase PA among children. Classroom-based health education courses designed to provide information about PA and health generally do not devote adequate time for students to engage in substantial levels of PA (Kahn et al., 2002). While classroom-based health education programs can help children attain knowledge necessary to adopt healthy behaviors, this increase in knowledge and self-efficacy typically has little to no impact on exercise behavior (Kahn et al.).

Despite the lack of evidence supporting the abovementioned interventions, such approaches should not be fully discounted. Further research and rigorous evaluation are needed to examine the effectiveness of promising strategies, techniques, and programs intended to increase PA among children. This point alludes to the importance of considering evaluation and programmatic goal setting during the earliest stages of intervention selection. Adherence to program fidelity, long-term tracking of behavioral outcomes, and thorough documentation of findings (and reporting in the scholarly literature) are essential to understand the efforts and elements of successful PA interventions and advance best practices.

## Summary

This entry highlights the existence of effective measures to help children reach or maintain recommended levels of PA: (1) incorporating recommendations from authoritative governing body, (2) employing age-appropriate physical activities, (3) focusing on specific PA behaviors, (4) integrating social and/or familial support, (5) involving skill building and exercise self-efficacy activities, and (6) addressing multiple levels of influence. However, despite

the ability of programs to yield significant increases in participant PA, the majority of children in the United States still do not reach recommended daily PA levels. This may be explained by the diverse needs/resources of children, variation of existing PA programs, and the sporadic implementation of evidence-based programs across the United States. Implementation of a systematic approach in which effective programs and interventions are used across the United States would best help children meet recommended daily PA levels; however, challenges remain to meet the individual needs of children while simultaneously generalizing strategies and activities to accommodate the masses.

## See Also

- ▶ [Nutrition and Healthy Eating in Older Adulthood](#)
- ▶ [Peer Relationships: Promoting Positive Peer Relationships During Childhood](#)

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## Healthy Development in Children of Adoptive Parents

Doreen Arcus, Nicole Mason and  
Janelle Diaz

Department of Psychology, University of  
Massachusetts Lowell, Lowell, MA, USA

### Introduction

Children who are adopted in the USA are a diverse group. They include children adopted as infants whose birth parents and adoptive parents have never met, children whose birth and adoptive parents are engaged in an ongoing relationship, children adopted long after infancy due to abuse or neglect whose birth parents are prohibited from contact, children adopted after lengthy stays in institutional settings about whose birth parents little is known, children adopted from the local community, and children adopted internationally.

Children are considered adopted when individuals other than their biological parents assume legal parental responsibility for them. Persons who adopt must have reached the age of legal majority. They may be married or single, of higher or lower socioeconomic status, gay or straight, related or unrelated to the child, and of the same or different racial, ethnic, and cultural backgrounds as the child. They may adopt domestically or internationally through private or public agencies. In recent years, some countries have imposed restrictions on adoptive parent qualifications. Since 2006, for example, China has required adoptive parents to be between 30 and 50 years of age (55 for special needs adoptions; see below) of good physical and mental health, be in a heterosexual marriage, meet income and assets standards, have no more than five children under the age of 18, and have a clean criminal record with no evidence of domestic violence or substance (including alcohol) abuse (US Department of State, 2011). Russia, on the other hand, has few restrictions beyond those involving health and

fitness for employment and is working to implement a new agreement with the USA to enhance protections to safeguard the welfare of internationally adopted children (US Department of State, 2008). There are also many informal adoptions throughout the world; since there is scant research on these arrangements, they are not discussed here.

Adoptions vary in their degree of openness with respect to contact between the birth parents and adoptive family. Children in open adoptions have information about their birth family and may have additional contact with one or more members of the family, whereas children in closed adoptions do not have continuing contact although they may have information. Obviously, children removed from their birth families at later ages have the type of information characteristic of open adoptions, but contact with at least some family members is likely to be discontinued for safety. Special needs adoptions involve children in categories that are associated with lower probabilities of finding a permanent home: sibling groups, older children, minority group status, or medical or psychological challenges. The terminology can be confusing; children in special needs adoptions need have no special educational need (e.g., learning or other disabilities).

Adoption per se is a positive transaction, placing children without families who can adequately care for them into families who can. It is also a pervasive phenomenon across cultures and history, bringing with it special challenges to both the developing child and his or her family. These challenges, as well as the strategies that may work to minimize them, are best understood by the circumstances that lead to the adoption in the first place and the subsequent construction of that narrative in children's lives. That discussion provides the basis for this entry, which is focused on facilitating healthy outcomes among children who are adopted.

### Definitions and Scope

The most recent census data showed that 2.1 million, or slightly more than 2 % of children

living in US family households, were adopted (Lofquist, Lugaila, O'Connell, & Feliz, 2012). Older children and adolescents are overrepresented among adoptees. For example, 60 % of international adoptions in the USA in 2010 were of infants and children from 0 to 2 years old, while only 27 % of those adopted from foster care were in the same age range (US Department of Health & Human Services, 2011; US Department of State, 2010).

South Korea was long the primary country of origin for children adopted internationally in the USA, but that has changed. The one-child family policy in China has resulted in a marked increase in international adoptions of Chinese infants; in 2000, China accounted for only 3 % of all foreign-born adopted children in the USA, but by 2010 nearly one-third of children adopted internationally in the USA were from China. Another 23 % of children adopted internationally were from Ethiopia, 10 % from Russia, 8 % from South Korea, 4 % from the Ukraine, 3 % from Taiwan, and about 2 % each from Colombia, India, and the Philippines (US Department of State, 2010). Children adopted from outside the USA in 2010 were more likely to be girls than boys (56 % compared with 44 %; US Department of State). However, among children adopted from foster care, boys slightly outnumber girls as in the general population (51 % compared with 49 %; US Department of Health & Human Services, 2011).

Complete data on the type of adoptions that take place each year in the USA are sparse as few states require agencies to be licensed in order to place children in adoptive homes. In Massachusetts, a state requiring licensure, 34 % of the adoptions finalized in 2004 were of children from foster care, with the rest from private sources, 57 % international and 9 % domestic (Center for Adoption Research, 2006). Historically, the most reliable national data are from the public child welfare system, in which the number of adoptions has increased dramatically since passage of the Adoption and Safe Families Act of 1997 in large part due to the increasing number of relatives formally adopting children from foster care, 32 % of such adoptions in FY2010

(US Department of Health & Human Services, 2011). The median age of children adopted from foster care in 2010 was 5.2 years; 43 % were White, 24 % Black, and 21 % Hispanic; two-thirds were placed in families headed by a married couple, and 28 % placed in families headed by a single woman (US Department of Health & Human Services).

Not all adoptions last forever. Disruption is a failure of the relationship before it is legally finalized. Rates vary depending on the population studied, between 9 % and 15 % overall but about 25 % for older children (Festinger, 2005). Dissolution is a failure of the relationship after finalization, which has consistently been found to occur in between 1 % and 10 % of cases, more often in older child adoption (Child Welfare Information Gateway, 2004).

## Theories

Major theories in child psychology can be used to frame factors that promote healthy social and cognitive development from conception through adolescence, and most have application to special challenges of adoption during middle childhood, the period of focus for this entry. Of particular relevance are attachment theory, theories of cognitive development, and an ecological view of human development that acknowledges the interplay of factors between the individual and intertwined social contexts from immediate relationships to the cultural and historical setting.

Separation, loss, and attachment are at the core of the adoption experience. Attachment theorists generally hold that early parent-child relationships create a fundamental model on which subsequent social relationships grow (Bowlby, 1980). When parents are consistently responsive to their child's needs, they foster secure attachments that promote basic trust, exploratory behavior, adaptation, social skills, and emotion regulation; when primary relationships are marked by loss, neglect, or mistreatment, insecure attachment patterns may place development at risk, especially the capacity to cope with

stressful situations (van IJzendoorn, Schuengel, & Bakermans-Kranenburg, 1999).

Although attachment theory awards primacy to early relationships, stage is more important than age. Children's dependency in infancy and early childhood creates optimal conditions to establish trust; the hungry infant must rely on a caregiver for food. Older children have more capacity to fend for themselves and are less dependent on adults to meet their basic needs; the hungry 8-year-old can go to a cabinet and take a snack. However, in theory, children whose early relationships were marked by instability or deprivation may still develop secure attachments later on, although it may be more difficult for them to do so and may require special efforts. Engagement in nurturing relationships and the child's development of a secure attachment model is a central task of adoption in order to provide a foundation for further healthy social-emotional adjustment.

Theories of cognitive development also have special relevance to adoption. The onset of middle childhood is marked by dramatic shifts in cognitive capacity, characterized by Piaget as the development of concrete operations (Piaget & Inhelder, 1969). Children become less egocentric and are able to process multiple aspects of a problem at the same time, often exemplified by the preschool child's difficulty in telling that a volume of liquid in a short wide glass has not changed when it is poured into a tall narrow one, compared with the school-aged child's ability to see that volume is conserved. Implications for children who are adopted include an ability to consider the perspectives of others including birth parents ("Why did she give me away?") and multiple aspects of being in even the warmest and most loving adoptive family, an event inextricably intertwined with the loss of biological parents and perhaps secondary losses of extended family members (i.e., having this means losing that). Development of a theory of mind (ToM), understanding that others may hold beliefs and mental states different than one's own and that those beliefs and mental states may or may not reflect reality, extends beyond the preschool period (Miller, 2012). As their ToM evolves,

adopted children may begin to wonder about their birth parents' current feelings toward them ("Does she miss me?") in increasingly sophisticated ways across childhood ("Does she think that I miss her?").

Middle childhood is also marked by rapid improvement in episodic memory, the capacity to encode, store, and retrieve events as well as the contexts surrounding them, emerging from development of a neural network involving the hippocampus, prefrontal cortex, and posterior parietal cortex (Ghetti & Bunge, 2012) and forming the basis for autobiographical memory (Nelson & Fivush, 2004). As language skills become increasingly complex across middle childhood, children have the tools to understand, process, and store experiences in ways that allow them to create an integrated life narrative, which is especially relevant to children who are adopted.

Like all developmental processes, attachment and cognition unfold in context. A theoretical view that embeds the individual at the center of a series of interrelated social contexts approaches development in an ecological framework (Bronfenbrenner, 1979). As in any ecology, change is unlikely to occur in isolation, individual influencing environments and vice versa. Moreover, the larger cultural context provides meaning for events in the lives of individuals and families so that the meaning of adoption evolves as cultural ideals of family change and an appreciation of diversity becomes more widespread.

## Current Research

The first US population-based survey to investigate the post-adoption experiences of children from across adoption types – international, from foster care, and other domestic placements, with the exclusion of stepparent adoptions – was conducted in 2007–2008 (National Survey of Adoptive Parents (NSAP); Vandivere, Malm, & Radel, 2009) and provides an important data set for comparative and multivariate analyses of children's adjustment. Research continues to emerge from this data set as well as the secondary

sample of adoptive parents of children with special needs. The following section draws heavily from this landmark survey in addressing the extent to which adoption is a problem or risk factor for school-aged children.

Children who are adopted do appear to be at heightened risk for problems across a variety of health, social, and educational domains. On average, however, most adopted children score in the normal range on adjustment rating scales.

Although 87 % of adopted school-aged children in the Survey of Adoptive Parents (NSAP) were reported to be in excellent or very good health overall, 29 % were reported to have moderate or severe health problems – significantly more than the general school-aged population with the highest prevalence (46 %) among children adopted from foster care. While this may appear contradictory at first glance, adopted children also had more consistent access to health insurance and, especially among school-aged children, were more likely to receive coordinated and ongoing medical care. Children who were adopted were also less likely to live in poverty than non-adopted children, and, among adoption types, internationally adopted children were most likely to have parents with college education, high income, and full-time employment (Vandivere, Malm, & Radel, 2009).

The NSAP revealed more social-emotional problems among adopted children compared with non-adopted children although the absolute prevalence was low. Adopted school-aged children were twice as likely to have behavior problems (10 % vs. 5 %) and ADHD (21 % vs. 9 %), especially among children adopted from foster care (32 %). Fewer adopted children were described as consistently engaged in school (80 % vs. 86 %), and children adopted from foster care were less likely than children from other adoptive backgrounds to have strong reading, language arts, and math skills. Children who were adopted were also more likely to be engaged in activities outside school (athletics, clubs, etc.) than their non-adopted peers (89 % vs. 79 %). Although parents of children adopted from foster care were less likely to describe their relationship with their child

as very warm and close, the majority did so – 81 % compared with 90 % for international adoptions and 93 % for other domestic adoptions (Vandivere, Malm, & Radel, 2009).

Recent developments in neuroscience and environmental deprivation suggest mechanisms by which some of these problems may arise in adopted children. In the NSAP, for example, children living in congregate care prior to their adoption were less likely to have strong reading and language arts skills (Vandivere & McClindon, 2010), consistent with the finding among non-adopted children that environmental stimulation at ages 4 and 8 predicted language skills at age 12 in a low-socioeconomic-status (SES) sample (Farah et al., 2008), implicating stimulation per se and not the broader contexts of SES. The impact of deprivation on brain structure in 8- to 11-year-olds was demonstrated in the Bucharest Early Intervention Project (BEIP; Sheridan, Fox, Zeanah, McLaughlin, & Nelson, 2012) in which children living in institutional settings between the ages of 6 and 31 months were randomly assigned to either continue on in the setting or be placed in family foster care (FC). The neural development of both groups was later compared with children never institutionalized (NI) using MRI. Although both groups of children with institutional histories had lower cortical gray matter volume than NI children, children placed in FC showed greater white matter volume than those children continuing in the institution and were not significantly different from NI, providing evidence of compensatory potential in children removed from institutional settings and placed in families (Sheridan, Fox, Zeanah, McLaughlin, & Nelson, 2012). These neurological findings are consistent with the results of a meta-analysis of 62 adoption studies including over 17,000 children in which such consistent evidence of cognitive “catch-up” was found among adopted children that the authors concluded adoption itself was a natural and effective intervention (van IJzendoorn & Juffer, 2005).

In addition to the BEIP, extensive follow-up of children adopted from Romanian orphanages has shown that early and prolonged

institutionalization and deprivation have lasting effects on multiple aspects of children's development, including high rates of ADHD, language and cognitive impairment, stereotyped and autistic-like behaviors, and difficulties with attachment and in social interaction (Rutter & Sonuga-Barke, 2010). Relative to other internationally adopted children from foster care, previously institutionalized 8- to 11-year-old children also showed elevated levels of externalizing problems and, by their own assessment, internalizing symptoms beyond the clinical cutoff (Wiik et al., 2011). Over 80 % of a sample of 9- to 13-year-old children adopted from Russia after spending an average of 3 years in institutions were found to require special education, 62 % with language disorder, and 42 % with ADHD (Beverly, McGuinness, & Blanton, 2008). Long-term global cognitive impairment was found in 37 % of a sample of previously institutionalized children being raised in the USA (mean age 9.4 years), and among the 63 % who were globally intact, over half showed no cognitive impairment at all; the degree of impairment shown by the remaining children was correlated with the amount of time institutionalized (Behen, Helder, Rothermel, Solomon, & Chugani, 2008).

In addition to institutional deprivation, the consequences of child abuse and neglect are important factors to consider in the well-being of school-aged adopted children. Among all adoptive parents in the NSAP, 40 % believed their child had probably experienced neglect prior to the adoption, 26 % physical abuse, and 11 % sexual abuse (Vandivere & McKlindon, 2010). These numbers were obviously higher for adoptions from foster care (59 % neglect, 44 % physical abuse, and 21 % sexual abuse) but not trivial for other domestic adoptions (25 %, 18 %, and 5 %, respectively) or international adoptions (36 %, 11 %, and 4 %). Among 6- to 8-year-old Chinese girls adopted in the USA, those with a history of neglect showed significantly lower academic achievement and overall competence than those adopted without a neglect history (Tan, 2006). Adopted children with a history of complex trauma resulting from maltreatment in the context of a caregiving

relationship showed significant delays in overall adaptive behavior (age equivalent 4.4 years compared with 9.9-year chronological age) and clinically significant scores in both externalizing and maladaptive behaviors (Becker-Weidman, 2009). Lesser amounts of adoption preparation and poorer adoptive family function, but especially a history of sexual abuse, were found to predict externalizing behavior in a large sample of 6- to 18-year-old boys adopted from foster care (Nalavany, Ryan, & Hinterlong, 2009). The relation of sexual abuse history to more placement moves, more disruption, and inconsistent parental commitment suggests additional mediating factors in the ongoing environment (Nalavany, Ryan, Howard, & Smith, 2008). The centrality of maltreatment history to externalizing problems in adopted children is supported characteristics of a nationally representative sample of adopted and non-adopted adolescent boys. Although background characteristics such as early maltreatment and family relationships were predictive, no additional risk for developing externalizing behaviors were found as a result of adoption status (Grotevant et al., 2006).

These data clearly demonstrate their importance, and it is heartening to observe that information about the preplacement care and experience of the child is increasingly included in studies of adopted children over the past decade.

## Overview of Strategies

Empirically supported strategies for promoting healthy development in children who are adopted are consistent with practices that would be predicted by attachment, cognitive, and ecocultural theories of development. Efforts to promote the development of secure relationships, an integrated view of oneself and understanding of one's own life story, and the capacity to navigate the social and cultural milieu address the core of adoption-related challenges for the child and his or her family. These will be discussed below. Strategies to address neurocognitive difficulties associated with prior maltreatment,

neglect, or deprivation will be those that have been demonstrated to work on the specific presenting problems – ADHD, language delay, learning disabilities, and developmental trauma disorder – with non-adopted children. Please see related entries for a discussion of those strategies.

## What Works

A search of the literature did not uncover an intervention that met the standard of three successful trials, at least in part because of the dearth of experimental designs and the reliance on correlational data in this area.

## What Is Promising

*Openness.* The extent to which an adoption is open, that is, the adoptive family is open to contact with the birth parents, may affirm the reality of multiple and complicated attachments in the lives of adopted children. Several older studies that investigated openness occurred when open adoptions were relatively rare and therefore not representative of the general population. More recently, at least two studies provide correlational evidence linking openness in adoptions to positive outcomes in middle childhood. Brodzinsky (2006) examined child adjustment as a function of openness in a sample of 73 children (8–13 years) adopted prior to 18 months of age, 25 % of whom were adopted domestically and 15 % adopted into interracial families. Structural openness fell into one of three categories: 45 % of families had closed adoptions with no birth parent contact, 27 % had mediated adoptions with some type of contact between adoptive and birth parents through an intermediary, and 27 % had fully disclosed adoptions in which adoptive parents – and, in many cases, the children themselves – maintained direct contact with birth parents. Children also reported how comfortable they were discussing adoption with their parents as an index of adoption communication openness. Greater structural openness was related to higher child self-esteem. Greater adoption openness was

associated with higher self-esteem and fewer behavioral problems.

Eight years after adopting, parents in the California Long-Range Adoption Study reported on the experiences of their 231 children (mean age, 11 years) in open (42 %) or closed (58 %) adoptions (Frasch, Brooks, & Barth, 2000). At least 50 % of those who maintained contact with biological family members felt that it had a very or mostly positive effect on both the child and adoptive family, with a small number (13 %) reporting a negative effect of contact. Interestingly, adopted children's contacts with birth relatives were likely to be with individuals other than their parents – siblings (36 %), grandparents (22 %), and aunts or uncles (13 %). This has important implications for conceptualizing openness beyond parent and child, especially for those children whose adoptions are due to abusive or neglectful relationships with their birth parents with whom continued contact could be nonproductive at best and re-traumatizing at worst. Other extended family members may be able to help these children construct their life narratives with items adoptive parents cannot provide such as information, photos, mementos, or shared physical characteristics in the context of an ongoing relationship.

*Social Skills and Social Relationships.* Children who are adopted may be ill equipped to handle complicated social interactions during middle childhood, when the importance of peer relationships is ascendant. Over 50 % of an English sample of 5- to 13-year-olds reported uncomfortable adoption-related comments or teasing from peers (Neil, 2012), and 20 % of a Finnish sample, those with attachment disorders and poor social skills, reported being bullied (Raaska et al., 2012). Children who are adopted into families with clearly different ethnic, racial, and cultural backgrounds have a larger and more public stage for resolving adoption-related issues, and perceived discrimination, either racial or adoption related, has been linked to child internalizing and externalizing problems among children adopted from Asia and Latin America (Lee, 2010). However, peer victimization and exclusion is less likely to be associated with



stress, as indexed by cortisol levels, among children with more friends or better quality friendships, suggesting that enhancing social skills and promoting peer relations may moderate these stresses (Peters, Riksen-Walraven, Cillessen, & de Weerth, 2011).

To help children finesse unwelcome questions from peers, it may help to develop a “cover story” (Fahlberg, 1991). The child who has a brief, not particularly revealing, explanation of why he or she is not living with parents (e.g., “My parents couldn’t take care of me, so I needed a new family that could”) will have a script available for situations that might be emotionally arousing and in which they might feel conflicted or confused. By providing a vehicle for negotiating such situations and the tools to protect his or her own privacy, the cover story can contribute to a child’s sense of agency and social competency.

Teachers should be sensitive to classroom assignments that might raise issues for adopted children and call undue peer attention to the child in the important social context of school. Genetics and family tree assignments are obvious candidates, but apparently innocuous assignments can carry emotional baggage as well. Consider the reaction of a youngster to a geography assignment involving Seoul, Korea (the city in which he was born), who remarked, “I understand how you told me that my birth mother could not take care of me, but what was wrong with all those other billions of people?” (Pavao, 1998, p. 48).

Interventions designed to promote attachment in families may also be effective in promoting healthy development of adopted children, though the empirical evidence is not strong. Wimmer, Vonk, and Bordnick (2009) found attachment therapy to be effective in reducing ratings of disordered attachment behaviors and improving ratings of functioning among adopted children (mean age, 9.8 years) though it did not employ a control group or conduct long-term follow-up. Another attachment-based intervention targeting parents during the child’s first year showed mixed results for long-term effects among adopted children: the program was associated with increased maternal sensitive responsiveness and child

attachment security and exploratory behavior in early childhood, but positive effects extended to school age only among some children in families with both adoptive and biologically related children (Stams, Juffer, van IJzendoorn, & Hocksbergen, 2001). Somewhat surprisingly, at least two recent studies have found aspects of enhanced social competence in children adopted into single-parent families (Tan & Baggerly, 2009; Vashchenko, D’Aleo, & Pinderhughes, 2012), perhaps because a less complicated family structure facilitates the establishment of attachments, especially among children with deprivation or maltreatment histories (Groze & Rosenthal, 1991). Hence, although it seems clear that promoting social skills and relationships through attachments would nurture positive development, it is less clear precisely how to do so.

*Embracing Cultural Diversity.* Cultural socialization experiences have been associated with positive outcomes in internationally adopted children (Lee & Quintana, 2005; Vonk, Lee, & Crolley-Simic, 2010), and recent work suggests that parents are more likely to engage their children in such experiences when they have high racial awareness (i.e., are less “color-blind”) and when they reflect on their own beliefs about enculturation and consciously decide to engage in such practices with their children (Lee, Grotevant, Hellerstedt, & Gunnar, 2006). These findings have clear implications for agencies to facilitate such reflection and connect families to enculturation resources.

*Developmental Trauma.* Children who experience trauma often do so in the context of ongoing relationships while their neurological, attachment, cognitive, attentional, and regulatory systems are still developing. Chronic traumatic experiences may therefore have pervasive and long-lasting consequences across multiple and interrelated systems in ways not captured by a diagnosis of post-traumatic stress disorder. Significant numbers of NSAP parents believed that their children had experienced pre-adoptive abuse or neglect, even those who were adopted from other than foster care, which makes the complex consequences of maltreatment evident

in developmental trauma disorder a pertinent consideration for school-aged children who are adopted. Especially when pre-adoptive histories are uncertain, recognizing that a host of problems – attention, behavior, learning, and emotion regulation – may indeed have some common core has the potential to direct treatment in a more efficacious manner and may help to avoid over-pathologizing children with multiple diagnoses when a host of dysregulatory symptoms may be part of an overarching impediment to development (van der Kolk, 2005).

Sensitive diagnoses require clinicians to be trauma informed and should include recommendations for home and school. Trauma histories may display in children's behavior, social relationships, and academic performance – poor communication, organization, executive function, problem solving, perspective taking, attention and emotion regulation, reactivity, aggression, oppositional defiance, and withdrawal. Cumulative risks may be substantial since all of these may contribute to school failure and disengagement, which have been associated with poor outcomes in adolescence and adulthood. School practices that promote ongoing relationships with caring adults, foster the modulation of emotion and reaction, and assist children to achieve learning goals and make effective progress will nurture all students and be especially helpful for adopted children with trauma histories (Cole et al., 2005).

*Individuality.* Focusing on the commonalities of children who are adopted minimizes the myriad sources of individual differences that characterize these children, including the temperamental lens through which they experience the world. Adversity may cause some to externalize and others to turn inward. What works to help a child with one temperament may not work for another child in the same situation but with a different underlying physiology or level or reactivity. Although there have been strides in understanding the role of temperament in development and psychopathology (e.g., Kagan, 2010), understanding the role of temperament in the development of children who have been adopted is a research area in its infancy.

*Looking Ahead.* Perhaps the greatest opportunity in middle childhood lies in the capacity for parents and children to lay the groundwork for what is to come: puberty, adolescence, and the transition to adulthood. An authoritative approach to parenting may be particularly helpful in establishing open lines of communication, supports, and boundaries while scaffolding the child's social, emotional, and cognitive development. Authoritative parents are warm and involved. They set limits but are not harsh or coercive. Among non-adopted children, authoritative parenting has been associated with positive outcomes from preschool to adolescence across ethnicity and socioeconomic status (Baumrind, Larzelere, & Owens, 2010). Among formerly institutionalized 10-year-old children, parental warmth and stimulation was associated with significant reductions in inattention and overactivity, which, left unchecked, may contribute to difficulties in peer relationships (Audet, & LeMare, 2011).

### **What Does Not Work**

It is highly unlikely that an authoritarian parenting style – harsh, coercive, and domineering – will promote adjustment in adopted children. Decades of research have linked it with poor outcomes across diverse groups. Recently, adolescents who had experienced authoritarian parenting as preschoolers and during elementary years were found to be poorly adjusted and less competent compared with other groups after controlling for initial child differences, with preschool parenting more predictive than school age (Baumrind, Larzelere, & Owens, 2010).

### **Summary**

School-aged children who are adopted are a diverse group with common challenges around the need to integrate disparate threads into a coherent life narrative while holding multiple attachments to parent figures and developing mutually supportive peer relationships. They

may have additional challenges in their pre-adoptive histories and in the cultural lens through which children view themselves and their families. Children may have a wide range of developmental, neurocognitive, social, and emotional problems depending on the circumstances of their early lives. Efforts to establish open lines of communication and fluid family boundaries that may include members of the birth family, secure attachments, social skills, and cultural awareness will very likely nurture positive development. Specialized assistance or intervention for problems such as ADHD or developmental trauma disorder may also be an important part of the adoptive child's adjustment. Research in adoption has improved both in quality and in quantity over the past decade, and we hope for further advances, especially in intervention research and individual differences, in the decade ahead.

## See Also

- ▶ [Attention Deficit Hyperactivity Disorder During Childhood](#)
- ▶ [Healthy Development Among Youths in Foster Care](#)
- ▶ [Peer Relationships: Promoting Positive Peer Relationships During Childhood](#)
- ▶ [Resiliency During Early Childhood](#)
- ▶ [Social and Emotional Learning: Children](#)

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## Healthy Development in Children of Divorced Parents

Anthony G. James<sup>1</sup> and Mark A. Fine<sup>2</sup>

<sup>1</sup>Department of Family Studies & Social Work, Miami University Hamilton, Columbia, MO, USA

<sup>2</sup>Department of Human Development and Family Studies, University of North Carolina at Greensboro, Greensboro, NC, USA

### Introduction

Studies report that between 40 and 50 % of children will experience the dissolution of their parent's marriage (See <http://www.heritage.org/research/reports/2000/06/the-effects-of-divorce-on-america>, Hetherington and Elmore, 2003). How those children adjust to the divorce depends largely on processes that occur both within the individual (i.e., child/children) and within the family. Studies over the past decade continue to show that children whose parents divorce, when compared to children whose parents have not divorced, score significantly lower on behavioral, socioemotional, cognitive, and academic outcomes (Amato, 2010). Research on whether this gap in scores has changed over time is mixed. One study showed a decreasing gap in scores in the 1980s (Amato & Bruce, 1991), while another study showed an increasing gap in the scores in the 1990s (Amato, 2001).

Part of the explanation for why studies have found mixed results regarding differences in outcomes across divorced and nondivorced groups is that parents can help lessen the negative effects of divorce through responsive and sensitive parenting behavior. When parents engage in relatively low levels of parental conflict, keep their children out of their conflicts, and communicate directly with each other, their children adjust more effectively. Accordingly, work over the past decade has increased the knowledge base for practitioners and researchers on ways to enhance children's and youth's adaptation to the divorce of their parents. To that end, the focus of this entry is a review of the empirically based and tested "best

practices" to help children and youth navigate through and/or heal from the generally negative effects of divorce.

### Definitions

The term *divorce* refers to the legal termination of a marriage. *Legal custody* is a legally binding decision or order obligating whom is responsible for the rearing and welfare of the child. Parents can have *joint* custody (both parents have equitably shared responsibility of their child/children) of children or one parent can have *sole* custody. Legal custody is distinct from *physical custody*, which refers to where the child actually resides. When the child/children live primarily with one of the parents, that parent is considered the *residential parent* and the other parent is referred to as the *nonresidential parent*. When one of the parents has sole legal custody, that parent is usually the mother with the father being the nonresidential parent. *Visitation* refers to the time spent between the nonresidential or noncustodial parent and the child. *Child support* refers to financial support, usually provided by the nonresidential or noncustodial parent, supplied to the residential/custodial parent to help meet the resource needs of the child. A *parenting plan* is a document that describes the plan that both parents have agreed to regarding how the child will be raised. The parenting plan typically includes the child support and visitation plans, custody arrangements, where and with whom the children will spend the holidays, how fees for extracurricular activities will be paid, and even plans for how the child's college education will be funded. Finally, a *motion to modify decree(s)* is a legal mechanism whereby one parent attempts to legally change the provisions in the original divorce settlement.

### Scope

The US divorce rate has varied significantly over the past 200 years. The rate of divorce for first marriages in the mid-nineteenth century was



estimated at 5 %, while studies throughout the first decade of the twenty-first century have estimated that the US divorce rate is between 40 % and 50 % (Cherlin, 2010). The sharp increase in divorce rates in the USA began in the 1960s, peaked in the 1970s, and has slightly decreased since the early 1980s (Teachman, Tedrow, & Crowder, 2000). The change in divorce rates did differ by ethnicity (e.g., after 1990, the rate continued to climb for African American women but decreased for European American women, Teachman et al., 2000) and educational achievement (e.g., women who obtained a college education had a rate that decreased at a sharper rate than those women who achieved only a high school diploma or no diploma at all; Martin, 2006). Additionally, about half of US divorces involve children under 18 years of age, which result in approximately 40 % of children born in the 1990s experiencing a divorce before they turn 18 years old (Kreider, 2007). The overall divorce rate differs for different ethnic groups, with African Americans having a divorce rate higher than both European and Hispanic Americans (Orbuch & Brown, 2006), with Hispanic Americans having a divorce rate similar to European Americans (Teachman et al., 2000).

When considering cultural differences in the divorce rate, the laws that govern the accessibility of divorce and cultural beliefs influence the change in rates of divorce. For instance, the divorce rates in Western European countries increased substantially during the latter half of the twentieth century. This was largely due to those countries adopting legal systems that allowed for no-fault divorces (i.e., the marriage is irrevocably broken without having to assign fault to either spouse; therefore, adjudication of the divorce can occur without either spouse having to establish who is responsible for the broken marriage) (Fine & Fine, 1994). However, cultural factors (e.g., strong influence of Catholicism) have resulted in low divorce rates in countries like France and Italy. Those countries also have relatively restrictive laws against divorce as well. Finally, in some Eastern countries, the divorce rate increased rapidly at the end of the twentieth century, but their rates are still far lower

than in Western nations (Goode, 1994). According to one report, the increase in the divorce rate in one Eastern nation (i.e., Taiwan) is due in part to individualism and women's financial independence and educational attainment (Yun-Tung, 2011).

### Theories that Help Understand Divorce and Its Consequences

Numerous theories have been employed to understand divorce and its subsequent effects on children and family members. The *social learning perspective* highlights that children learn relationship behaviors through observing their parents. For example, children whose parents are divorced have a higher likelihood of experiencing divorce themselves in their own romantic relationships. Additionally, boys are more negatively impacted by divorce because mothers are more likely to have custody of them, which reduces their time with a same-sex role model (i.e., their father).

The *social exchange perspective* posits that individuals decide whether to continue or end their relationships based on perceptions of its costs and benefits, relative to available alternatives outside the relationship. If viable alternatives exist, and if the ratio of costs/benefits is greater than what one expects (i.e., one's comparison level), an individual may divorce; by contrast, if no viable alternatives exist and if one receives more benefits relative to costs than one expects, one will be less likely to divorce. According to one variant of social exchange theory, the strongest predictor of whether a relationship will continue or end is the extent to which each of the partners is committed to the relationship. Commitment is enhanced to the extent that one's benefit/cost ratio is high, one has few attractive alternative relationships available, and when the couple has made investments (e.g., a shared home, children, joint bank accounts) in the relationship.

Finally, the *symbolic interactionism perspective* emphasizes the meaning individuals attach to their experiences and how that meaning

influences behavior. Individuals actively engage in a process of trying to understand the dissolution of their marriage. Although the partners have experienced the same event (i.e., divorce), spouses may construct different stories (or narratives) to help them cope with the difficulties attached to the painful event. Each partner is likely to develop a divorce narrative that places him or herself in a positive light. According to the symbolic interaction perspective, the meaning that one assigns to the divorce and how one thinks about it influences how individuals will behave and cope with this stressor.

Each of these perspectives has aided in the development of programs designed to help families adjust to the difficulties of divorce. For example, the vast majority of parent education programs for divorcing parents have encouraged the parents to model adaptive behavior (the social learning perspective), to make decisions based on careful assessments of the benefits and costs associated with different decisions (the social exchange perspective), and also to help parents “make sense” of their situation by allowing them to construct or adjust their narrative or story of the negative experience (the symbolic interaction perspective).

### **Research on the Effects of Divorce on Children**

Research has found that children from divorced families fare somewhat more poorly than children from first-married intact families on nearly all outcome dimensions that have been studied (e.g., behavior problems, health, and psychological well-being) (Amato, 2005). In his follow-up meta-analysis of children in the 1990s, Amato (2001) found that children of divorce scored, on average, approximately two-tenths of a standard deviation below children from first-married intact families on several dimensions.

With that said, one of the major critiques against studies that compared children of divorce to those from first-married intact families is that such comparative or correlational studies do not allow for an inference that the divorce caused the

poorer child outcomes. That critique was followed by studies (e.g., Cherlin et al., 1991) that found that children of divorce had adjustment difficulties prior to the divorce as well as in the postdivorce years. This suggests that other factors, besides the divorce, are causal to the adjustment problems children of divorce have in postdivorce years.

Recent research has attempted to address this issue by measuring child outcomes before and after divorce and examining the differences in adjustment before and after. Sun’s (2001; Sun & Li, 2001) longitudinal studies found that youth whose parents later divorced had lower self-esteem, more behavior problems, and lower scores on standardized achievement tests when compared to youth whose parents would later remain continuously married. In a follow-up study, Sun and Li (2002) found that youths whose parents divorced had lower test scores 3 years prior to divorce than youth from continuously married families. Some evidence for divorce causing adjustment problems was found when test scores further declined in the postdivorce years. However, the self-esteem of the youth declined as their parent’s neared divorce and increased in the postdivorce years. In a similar study examining differences between children of continually married families and children of divorce, Strohschein (2005) found that the children whose parents divorced had higher levels of antisocial behavior, depression, and anxiety prior to the divorce, with greater increases in anxiety and depression after the divorce; however, the children of divorce did not exhibit more antisocial behavior after the divorce than did the children from continuously married families.

There are several other factors that are associated with children and family members’ levels of adjustment following divorce. More specifically, what the child and family experience after the divorce, known as family processes, is related to their adjustment to the divorce. Fine (2000) found that children of divorce fared better when they are exposed to very small amounts of conflict between ex-spouses, have harmonious and conflict-free interactions with other family

members, and have increased amounts of warmth and parental supervision. Other studies have found that declines in household income, ineffective parenting from resident parents, loss of contact with nonresident parents, and continued conflict between parents are all related to individuals adjusting poorly to the divorce (Fabricius & Luecken, 2007; King & Sobolewski, 2006). Because most children continue to reside with one of their parents after the divorce, it is important to also consider research regarding adult's adjustment to the divorce.

### Effects of Divorce on Adults

How children adjust to a divorce can be directly linked to how well their parents adjust to the divorce (Walker, 2003). Crucial to a child's healthy adjustment is their having confidence that their parents will be physically and emotionally available to them. However, divorce is difficult for adults as well and can – unfortunately – make them less available to their children. Because of its effects on the parent children relationship (Walker, 2003), we review some of the difficulties adults/parents face during the process of divorce that can impede children's healthy development.

While researchers are appropriately cautious in concluding that divorce causally affects children's postdivorce adjustment, some are more confident in their claim that going through a divorce causes adults to have postdivorce adjustment difficulties (Amato, 2010; Wood, Goesling, & Avellar, 2007). Overall, divorce has been found to negatively impact the well-being of adults, with difficulties being exacerbated for divorced mothers when compared to women who divorce with no children (Williams & Dunne-Bryant, 2006). This is likely due to the stress of dealing with the potential problems the child may endure from the divorce and feelings of guilt for putting the children through it, concerns that nonparents do not have to worry about. Further, Wade and Pevalin's (2004) research examined adults' mental health at multiple time points before and after transitions out of marriage and found that there was poor mental health before

the divorce, but a steep decline in mental health afterwards, providing support for causal claims.

To understand the mechanisms undergirding the poor adjustment to divorce, Johnson and Wu (2002) found that poor adjustment to divorce by adults was due primarily to higher stress levels as a result of the divorce (i.e., being divorced is inherently more stressful than being married). Lucas, Clark, Georgellis, and Diener (2003) found that divorce is strongly associated with long-term negative changes in life satisfaction for adults. Finally, a study with German adults (Brockmann & Klein, 2004) using an econometric methodology found that divorce increased the odds of mortality for both men and women, likely due to the accumulation of positive experiences and connections that being married produces. Those experiences provide individuals with "survival advantages" (e.g., larger family and social network) that can buffer against mortality. With their employment of longitudinal methodologies that allow for pre- and postdivorce comparisons, these studies increase our confidence in the claims that divorce causes negative effects on adults' postdivorce adjustment. However, even with such difficulties, factors such as having supportive social networks and establishing new and mutually satisfying relationships can help adults heal and better adjust to the difficulties that divorce brings.

### What Works

Unfortunately, intervention trial methodologies are not common in divorce research or more specifically research examining children's healthy adjustment to divorce. To date, a search of the literature did not uncover interventions that met the standard of three successful trials that would promote the development of a child that has experienced a divorce.

### What Is Promising: Strategies that Help Children and Adults Adjust to Divorce

#### Parent Education

Toward the end of twentieth century, states across the USA began first offering and then

mandating that divorcing parents attend parent education courses as a way to help them help their children adjust to the divorce (Amato, 2010). States such as Arizona and Missouri mandate these classes, but other states (e.g., Pennsylvania) merely recommend or offer them to families. Studies have found that parents find these classes to be useful to help them in terms of reducing conflict (Criddle, Allgood, & Piercy, 2003), but research is still lacking in terms of evidence that the courses actually have positive effects on children (Douglas, 2006). However, with their ability to reduce parental conflict, in conjunction with studies showing the benefits of low parental conflict on children of divorce, these types of programs seem to have the potential to be quite beneficial to children.

### Mediation

Mediation continues to be the best method for helping reduce conflict in contested divorce cases. When successful, mediators help parents construct and agree to a parenting plan that all stakeholders feel is best for the child; in fact, having mediated sessions can be part of the parenting plan itself. Studies have found that mediation lowers the cost of divorce, increases parents' satisfaction with the outcome, and decreases the likelihood that couples pursue litigation (Douglas, 2006). Additionally, one decade-long study (Emery, Sbarra, & Grover, 2005) found that for families in which couples used mediation, there was more contact between nonresident fathers and children, more communication and less conflict between divorced parents, and generally a greater satisfaction with divorce outcomes. A strength of this study's design was that divorcing couples were randomly assigned to mediation and no mediation groups, which allow us to have confidence in the conclusion that mediation is responsible for the improved outcomes that have been found to follow mediation. With that said, more representative research is needed on the actual effects of mediation on *both* children and adults. Mediation has been criticized for not adequately addressing power differentials within families (e.g., men having more resources and threats of domestic

violence), which has contributed to mediators being advised not to provide this service with couples that have severe relational problems or partners with personality disorders.

### Programs for Children

There are a variety of programs for children whose parents are separating or divorcing. Geelhoed, Blaisure and Geasler (2001) surveyed over 80 programs in the USA that were designed to help children adjust to their parents' divorce. These programs typically encouraged, but did not mandate, children to attend, and consisted of 1–2 sessions each lasting 4–5½ h in length. Additionally, according to Grych and Fincham (1997), these types of program have both educational and therapeutic elements to them and help children adjust to the stress from the divorce, improve their communication with their parents, learn coping skills, gain a clearer understanding of the difficulties surrounding the divorce, and improve their self-esteem. One of the more frequently utilized programs and curriculums used (globally) to help children adjust to their parent's divorce is the Children of Divorce Intervention Project (CODIP). This program was evaluated extensively by Alpert-Gillis, Pedro-Carroll, and Cowen (1989). They designed a study in which children of divorce completed the 16-week program and matched them with 81 children from intact families, using child, parent, and teacher adjustment ratings. The treatment group improved significantly more than the no treatment group on multiple dimensions, which, even though the children were not randomly assigned to the CODIP and non-CODIP groups, supports the effectiveness of the program.

In two other community-based intervention programs designed to help children adjust to divorce (Stolberg & Mahler, 1994; Wolchik et al., 2000), the programs include a group for parents. In the Stolberg and Mahler (1994) study, they only found marginal gains in student's adjustment following participation in the program and called for more research examining the format of the program to increase its effectiveness. Wolchik et al. (2000) study found that immediate initial effects of their program were

promising. They found that children reported having better coping skills and fewer adjustment problems, but the effects disappeared at the six-month follow-up. Although these programs are quite prevalent and many children participate in them, with the mixed evidence from the few comprehensive evaluations of them, researchers and practitioners should take caution in inferring that these programs are effective (Grych, 2005). More evaluation studies are needed to determine the following: (1) the effectiveness of the different programs and curriculums being used in these programs, (2) the adjustments needed to make existing programs more efficacious, and (3) the extent to which these programs are effective with, and need to be modified for, diverse groups of adults and children who have experienced divorce.

### Aspects of Successful Interventions

While we have shown that divorce has potentially detrimental consequences for children, there is some hope. Although children of divorce typically fair more poorly on several adjustment dimensions than do children from intact families, these differences are small in magnitude. While there are many reasons for the small-scale differences in adjustment between the two groups, one important reason is that parents can do a number of things to help their children cope with the difficulties of divorce. We now provide a list of behaviors that parents can engage in to help their children understand and adjust to their parent's divorce:

- Continually convey to children that, although their parents are divorcing each other, they are not divorcing the children. Children need to know that their parents will continue to be in their lives.
- Be vigilant about providing the needed resources for children to build a social support system (both professional and nonprofessional) that allows them a healthy outlet to understand and discuss the divorce in a safe setting. Earlier, we discussed several such programs that research has shown to be effective.
- Keep lines of communication open between the children and the nonresidential parent. Also, parents should attempt to speak to, speak about, and act toward the nonresidential parent in a cordial manner (and the nonresidential parent should reciprocate this cordial behavior).
- Regularly give children the message that they are not responsible for causing their parents' divorce and dispel the children's fantasy that the parents are likely to reunite.
- Set a schedule and routine and stick to it. This is helpful for reestablishing and/or strengthening the sense of security for children whose previous security blanket (i.e., having both parents available) has been taken away.

### What Does Not Work

Sometimes in the heat of the moment of divorce, parents can become overwhelmed by the hurt and/or pain caused by the issues surrounding the divorce. Unfortunately, this can lead to situations in which children are caught in the middle of a negative feud between ex-spouses. Research has found that the following behaviors are unhealthy for children's adjustment to divorce:

- Talking negatively about the ex-spouse in front of the children.
- Using children to communicate messages between the ex-spouses.
- Using children as a sounding board to vent about the difficulties of the divorce.
- Directly and/or indirectly contributing to children feeling that they are the reason for the divorce.
- Using the children as "leverage" or a "pawn" to hurt the ex-spouse (e.g., the parent threatens the child with not letting him or her visit or communicate(s) with the nonresidential parent).
- Not providing children with formal/professional or informal resources and supports to discuss how they feel about the divorce.
- Not being considerate of – or recognizing – the fact that the children will likely still consider the ex-in laws as members of their family.

- Parents introducing new love interests to the children too soon, especially overnight guests. This is potentially damaging and hurtful to children who are still mourning that their parents no longer being married. Meeting and interacting with new love interests can abruptly and stressfully challenge a common fantasy that many children have – that their parents will reunite and that they can help make this happen.
- Letting the difficulties in the (now ended) romantic aspects of their relationship interfere with the ongoing, co-parenting aspects of their relationship.

## Summary

With the divorce rate still lurking around 40–45 % for first marriages, millions of children will experience divorce before the age of 18. From our best, empirically based, knowledge, we know that divorce can have serious negative effects on both children and adults. However, parents do have behaviors at their disposal to lessen the negative effects that divorce has on their children. Additionally, some formal interventions, such as mediation and parenting education, and informal interventions, such as divorce support groups in schools, can complement parents' efforts to help their children. However, while many of these programs have great promise and can help children on several dimensions of adjustment, existing evidence is less than conclusive in demonstrating that they are effective. What is clear, though, is that effective parenting strategies, less conflict between ex-spouses, harmonious family interactions, and allowing children the space and opportunities to understand and respond effectively to the divorce can facilitate children's adjustment. The key challenge in the future will be finding the best ways, whether through formal or informal interventions, to help divorced parents parent more effectively, work together more cooperatively, interact more positively with their children, and build growth-inducing environments for their children.

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## Healthy Development in Children of Parents Who Are Emotionally Ill

Andrea Reupert<sup>1</sup>, Louisa Drost<sup>2</sup>,  
Joanne Nicholson<sup>3</sup> and Karin van Doesum<sup>4</sup>

<sup>1</sup>Institute of Human Development & Counselling, Faculty of Education, Monash University, Krongold Centre, Clayton, VIC, Australia

<sup>2</sup>University of Groningen, Groningen, The Netherlands

<sup>3</sup>Dartmouth Psychiatric Research Center, Lebanon, NH, USA

<sup>4</sup>Mindfit/Radboud Universtiy Nijmegen p/a Mindfit, Deventer, AJ, The Netherlands

### Introduction

All children require responsive, nurturing, and loving relationships, particularly in their early years. These relationships impact on children's development, both physiologically and psychologically. Given the importance of the parent-child relationship and the challenges all parents face, it is essential that parents are provided with support in providing supportive environments to their children. At the same time, parents who have a mental illness face the same demands that all parents do, in addition to managing their mental illness. This entry considers the various risk and protective factors associated for children, aged 5–12, whose parent has a mental illness. Interventions that promote positive determinants on children's well-being and/or aim to reduce risk factors for families will also be presented. This entry might be read in conjunction with another entry in this edition, which focuses on adolescents whose parent has a mental illness.

### Definitions and Scope

For the purposes of this entry, we define “emotionally ill” as a mental health problem, illness, or disorder. While mental health is a complex and multifaceted domain, mental health problems and

illnesses tend to refer to a range of cognitive, emotional, and behavioral disorders that persist over time and are functionally disabling in living skills, social interactions, family relationships, jobs, and/or education (Johnson, 1997). The debilitating nature of a mental illness is not necessarily a function of the diagnosis but instead depends on a range of factors, including whether an individual has access to adequate treatment, medication, and support. In this entry we exclude developmental and substance use disorders. Most of the research in the area of parental mental illness has focused on parental depression, but other disorders have also been examined including parental psychosis, anxiety, bipolar disorder, the various eating disorders such as anorexia nervosa and bulimia, attention deficit hyperactivity disorder, Münchausen syndrome, and borderline personality disorder.

According to the National Survey on Drug Use and Health, in 2008, 45 million Americans – approximately one in five adults – suffer from some form of mental illness and that among these adults, 4.8 % (or 11 million people) have a serious disorder (meeting the diagnostic criteria of the *Diagnostic and Statistical Manual of Mental Disorders: DSM-IV*). Many of these same adults have dependent children in their care.

There have been several attempts to estimate the number of families where a parent has a mental illness. In the USA, Nicholson and colleagues (2004) found 68 % of women and 54.5 % of men with a non-substance psychiatric disorder are parents and that they are more likely to be parents than those without a psychiatric disorder (62.4 % and 52.9 %). A UK national survey of psychiatric conditions reported that approximately 10 % of women and 6 % of men were parents (Parker et al., 2008). Reviews conducted across several Australian mental health agencies identified 28 % of clients as parents (Howe, Batchelor, & Bochynska, 2009). It needs to be noted, however, that there are many people who do not seek treatment for mental illness, and so, data extracted from client/patient records may well be an underestimate of the prevalence of children whose parents have a mental illness.

One of the first studies aimed at determining child, as opposed to parent, prevalence (of children whose parents have a mental illness) examined the issue from three estimation approaches (Maybery, Reupert, Patrick, Good-year, & Crase, 2009). The first approach examined census data from the Australian Bureau of Statistics and found that 23.3 % of all Australian children lived in a family where a parent had a mental illness. The second employed mental health service usage data for the year 2003–2004 across one Australian state and found 20.4 % of patients were parents, who had an estimated 14,403 children. Finally, a cross-sectional community study of 701 Australian families found 14.4 % of children had a parent with a mental illness. Collectively, such data indicate that up to one in five children live in families where a parent has a mental illness (Maybery et al., 2009).

## Theories

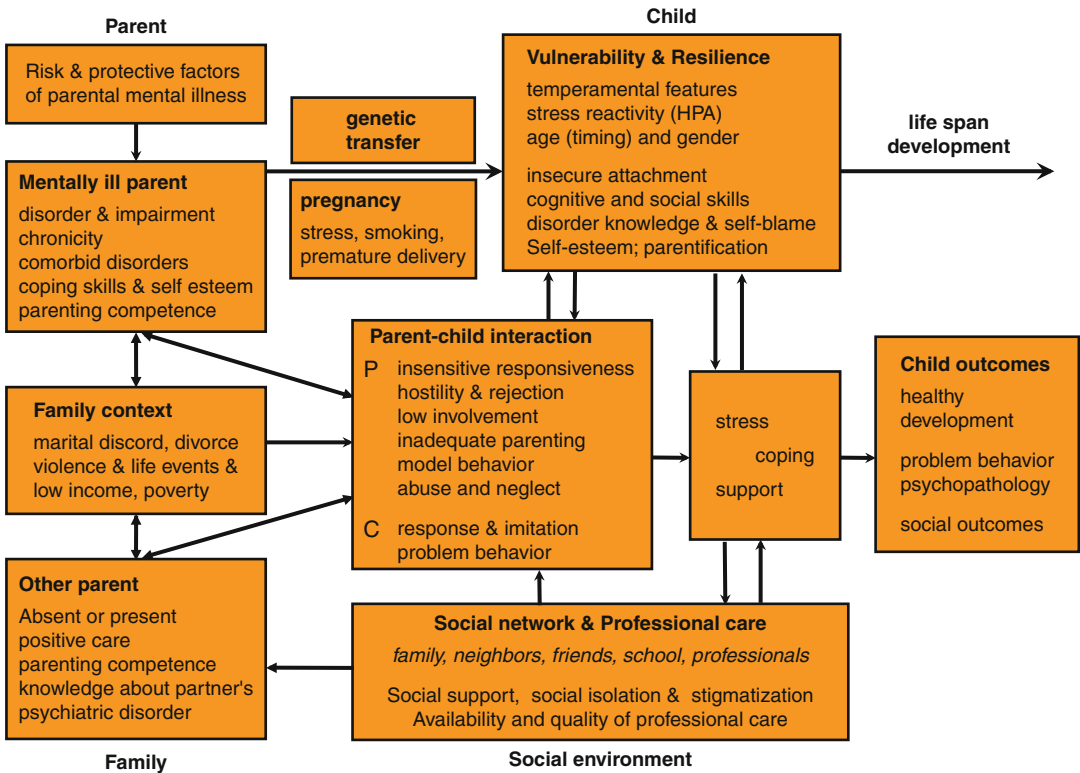
One theory that provides a framework for understanding how children are affected by parental mental illness was developed by Hosman, van Doesum, and van Santvoort (2009; see Fig. 1). Central to this model is appreciating that while parental mental illness is a significant risk factor for adverse outcomes in offspring, the presence of parental mental illness alone is not a direct pathway to problems in children. Even though many children whose parents have a mental illness develop problems themselves, a significant number grow up without any serious difficulties (Hosman et al., 2009). As outlined here, there are various factors, across child, parent, family, and community domains, which convey risk or alternatively serve to promote healthy development or prevent problems from occurring in children.

In the first instance, several twin, family, adoption, and high-risk cohort studies indicate a genetic contribution to the transmission of serious mental illness in offspring (e.g., schizophrenia, major depression, bipolar disorder) (as reviewed by Dean et al. (2010)). However, it

has also been found that the offspring of mothers with schizophrenia were found not only to have elevated risks of schizophrenia but also a range of psychotic, affective, and personality disorders (Dean et al.). Such a result suggests that the general vulnerability to the development of a mental disorder in offspring is mediated by both genetic and environmental factors. The biological transmission of risk is also a factor during pregnancy, for example, through prenatal substance use and maternal stress.

In terms of environmental factors, mental illness can compromise a parent's ability to care for children and the manner in which a parent interacts with his or her children. A parent's mental illness might cause him or her to be withdrawn, emotionally unavailable, or preoccupied (Brockington et al., 2011). The family context, including the presence of marital discord, violence, and the presence/absence of the other parent (and the presence of a disorder in the other parent), will also influence the level of risk children are exposed to. Conversely, a supportive partner and extended family members can buffer the negative impact of a partner's mental illness. Other factors associated with mental illness, such as unemployment, housing issues, poverty, and isolation, can also adversely impact on outcomes for children (Hosman et al., 2009). Children's characteristics (e.g., their temperament, age) and their social environment (such as their schools and neighborhoods) all play a role in determining outcomes as well.

It is also important to acknowledge that children's needs change depending on their age and, in particular, their age at the time of the parents' mental illness. For children, the early years are critical. Positive, early parent-child attachment establishes the foundation for children's healthy development and influences their future interpersonal relationships. A child who has had a calm, stable early childhood prior to the onset of a parent's mental illness may fare much differently and possibly better than a child whose early years were disrupted by the presence of parental mental illness and related poor parenting functioning that emerged before the child was born (Brockington et al., 2011).



**Healthy Development in Children of Parents Who Are Emotionally Ill, Fig. 1** A developmental model of

transgenerational transmission of psychopathology (Adapted from authors, Hosman et al., 2009)

Moreover, relationships between parents and children are bidirectional (Beardslee, Gladstone, & O'Connor, 2011). This means that each family member responds to, and contributes to, family interactions. The reciprocity between family members implies that parental mental illness may undermine healthy development, and in turn, children's responses may contribute to parents' emotional and functional status (Nicholson, Cooper, Freed, & Isaacs, 2008). Relationships involve continuous interactions and feedback over time, and outcomes are multiply determined (van Doesum, Hosman, & Riksen-Walraven, 2005).

In sum, interactions among genetic, biological, psychosocial, and social factors underlie the transmission of mental health problems from parents to children. Such a model acknowledges that not all children whose parent has a mental illness will be adversely affected nor will all children in the same family will be affected in the same way.

**Research**

Hosman and colleagues' model (2009; Fig. 1) identifies various risk and protective factors across several domains for parents, of either gender, across a full range of mental illnesses. This means that resilience in children is supported by the presence and promotion of protective factors and the absence or mitigation of risk factors. The model differentiates between successive developmental stages in the child's life, starting from a mother's pregnancy. A parent's caregiving responsibilities are determined by, and related to, a child's developmental age and stage. Each stage is linked to specific developmental processes and tasks and age-related onset of risk factors and psychiatric disorders. A parent may be well suited, in spite of mental illness, to meeting the needs of a younger child but may be extremely challenged by a teenaged child, as

different developmental ages and stages require different parenting styles and skills.

*Parents.* Several parental characteristics have been found to be associated with increased risk in children, including disorder severity and chronicity, parental age of onset, timing in the developmental stages of the child, family history of psychopathology, comorbidity with substance use or other illnesses, and psychopathology in both parents, rather than just one (Brockington et al., 2011). Parental behavior and the nature and quality of parent-child interactions mediate the impact of parental mental illnesses on outcomes for children (Hipwell, Goossens, Melhuish, & Kumar, 2000). Positive parenting was found to have a protective influence on the development of conduct problems in children of depressed mothers (Chronis, Lahey, & Pelham, 2007). Parents might also provide children with pathological role model behavior and coping styles, which will be copied by their offspring, for instance, in the case of emotional eating or the use of alcohol as a mood manager (Sidebotham & Heron, 2006).

*Child.* The major child-related vulnerabilities or risk factors identified in multiple studies include difficult temperament, behavioral inhibition, negative emotionality, stress reactivity, insecure attachment, negative self-esteem, poor cognitive and social skills, lack of knowledge about the parental disorder, the taking-on of age-inappropriate family responsibilities, and self-blame (as reviewed by Goodman & Gotlib (1999)). Resilience may be characterized by positive emotionality, safe attachment, cognitive and social competence, positive self-esteem, self-reliance, relevant knowledge about parental disorders, and perceived social support (e.g., Beardslee & Podorefsky, 1988). Positive characteristics such as adequate coping skills, interests and talents, and positive experiences such as success at school and in friendships protect children from negative outcomes (Nicholson, Albert, Gershenson, Williams, & Biebel, 2009).

*Family.* Family discord, domestic violence, and family-related stress can be both consequences of and contributors to parental mental illnesses (Brockington et al., 2011).

The second parent may play a protective role or can represent an additional risk factor. For instance, the presence of a parent who is caring and supportive to the child and who understands the disorder of the partner and can answer children's questions about a parent's mental illness can successfully buffer the negative impact of maternal depression (Chang, Halpern, & Kaufman, 2007). However, the presence of a partner who also suffers from mental illness or shows abusive behavior will further increase risk to the young person (e.g., Birmaher et al., 2009). In the case of single-parent families, more prevalent when parents have mental illnesses, support from the other parent might be totally absent; alternatively, the child might be spared the negative impact of a poorly functioning second parent.

*Social Environment.* Just as in other domains, the social environment outside the family can play both a protective and a risk-increasing role for children of parents with a mental illness. Research in this domain has primarily been sourced from retrospective and qualitative studies, such as in-depth interviews with adolescents and adult children of parents with mental illness (e.g., Knutsson-Medin, Edlund, & Ramklint, 2007). Networks may include grandparents, neighbors, friends, teachers, or peers living in similar circumstances. Relatives and friends may offer cognitive, emotional, and practical support to both parents and children, for instance, by providing respite and care when a parent is unavailable or by offering parenting advice, a listening ear, or opportunities for positive family or neighborhood events. Professionals in diverse systems may be supportive to youth depending, in part, on the context in which a parent's mental illness, youth's needs, or family issues emerge and are addressed. Additionally, Rutter and Quinton (1984) found that the direct effects of parental mental illness were less detrimental than the social adversity associated with mental illness, such as poverty, stigma, and housing issues.

In sum, factors in each of these domains contribute to the socio-emotional development of children whose parents live with mental illnesses.

The high risk and potential for negative outcomes in children underscore the need to carefully assess the risk factors within and across domains, the presence of protective factors, and the interactions between risk and protective factors. Risks may be additive and the ratio of risks to protective factors, that is, the balance of these factors, is key (Beardslee et al., 2011). Many of these factors are malleable and so provide an opportunity for interventions to target the parent, the child, the parent-child relationship, the family, and/or the community.

## Strategies

Hosman and colleague's (2009) integrative, developmental model offers a scientific framework for the development of a comprehensive, multicomponent prevention program for children of parents with a mental illness and their families. Approaches are further informed by the lived experiences of parents, children, and workforce members reported in the literature. These strategies aim to support the optimal functioning of parents, children's achievement of age-appropriate developmental tasks, positive parent-child interactions, and the responsiveness of a family's social and professional networks.

*Parents and Families.* It is important, in the first instance, to support parents' health, well-being, and functioning. All parents benefit from support, even when they are healthy and especially when they are ill. The early identification of mental illnesses, treatment, and support for parents is paramount, particularly as the remission of illness and enhanced functioning of one parent is likely to have benefits for all children in a family (Beardslee et al., 2011). Family members need to be supportive of a parent's efforts and, if necessary, assist in meeting basic family needs, to provide adequate security, safety, nurturance, and care to children.

*Child.* Children whose parents have mental illnesses are likely to benefit from the types of support that would benefit any children with ill parents. They require the caregiving and nurturance an ill parent may be unable to provide—from

a "well" parent, another relative, close family friend, or community member. Children may take on additional family responsibilities when parents are ill that conflict with age-appropriate activities or even attending school (Aldridge & Becker, 2003) and so require support in maintaining age-appropriate pursuits. As children may be concerned that they will develop the illness or that they caused their parent's illness (Fudge & Mason, 2004), they benefit from information about the illness, course of treatment, and expectations for the future. Adult children of parents with mental illness, in retrospective accounts, describe their panic and fear when a parent was hospitalized, typically with no explanation and with no understanding of when or under what circumstances the parent would return (Foster, 2010). If parents are hospitalized, arrangements should be made for supporting appropriate contact with children, in person or via telephone or email, to reassure both children and parents about the situation.

*Workforce.* Service providers and, in particular, adult mental health service providers should routinely "screen" for parenting status and concerns as well as mental health issues. As well, professionals should be acquainted with community resources, mental health and family advocacy networks, and web-based resources that may be helpful to children and families living with parental mental illnesses. An online resource, *Keeping Families and Children in Mind*, has been recently developed for professionals, which aims to enhance awareness and skill when working with this target group, with promising evaluation results (Reupert, Foster, Maybery, Eddy, & Fudge, 2011).

## What Works

We identified the following interventions for children, aged 5–12 years of age, whose parents have a mental illness, on the basis of a review of the literature, our collective experience as clinicians and researchers in the field, and from consultation with various consumer, carer, clinician, and researcher networks. Note that



many interventions listed here do not fit precisely within the 5–12 age group but at times extend into younger and/or older age groups.

Beardslee's Prevention Intervention Program (PIP) is the most rigorously evaluated program in this area, though it must be noted that most of these evaluations were based on the same sample group and the focus is parental depression only (e.g., Beardslee, Wright, Gladstone, & Forbes, 2007). PIP targets families where a parent is diagnosed with a major depressive disorder or bipolar disorder, with children aged between 8 and 15 who have never been treated for an affective disorder. The intervention is based on a cognitive psychoeducational primary prevention model and consists of between 6 and 10 sessions, conducted with the parents, the children, and the whole family. The aim of the program is to increase parents' knowledge about the symptoms and causes of depression and encourage families to talk about their experiences of depression and the effects on the family. Follow-up occurs for up to 1 year to monitor and support the family. A comparison intervention was developed, consisting of a two-session lecture discussion group with parents only, regarding psychoeducation about mood disorders and strategies to foster children's resiliency. The aim of both interventions is to decrease the effect of family and marital risk factors, enhance parental and family functioning, and prevent the onset of depression and other mental health problems in children.

Following both clinician-led and lecture-style interventions, parents reported increased discussion and knowledge about depression and children's internalizing symptoms improved (Beardslee et al., 2007). Compared to the lecture intervention, the clinician-led intervention recorded improved family communication and improved parental reports of children's behavior and children reported greater understanding of depression, at follow-up periods (Beardslee et al.). Numbers of children within both groups diagnosed with depression 4.5 years after intervention were similar, suggesting that both the clinician-led and the lecture conditions were equally effective in preventing the development

of depression in children whose parent has an affective disorder (Beardslee et al.). PIP has been adapted for a low-income, cultural diverse family though at this point has not been evaluated (Beardslee et al., 2011).

## What Is Promising

There are other family-based programs for children where a parent has depression, also employing a cognitive-behavioral model, that have not been as rigorously evaluated as Beardslee's intervention outlined above. For example, Sanders and McFarland's (2000) Cognitive-Behavioral Family Intervention (CBFI) is an intervention for mothers who have depression and their 3- to 9-year-old children that targets mothers' depression and the mother-child relationship. It must be noted however that this program was designed for children who had either a conduct disorder or an oppositional defiant disorder. Therapy is provided to individual families involving eight clinic sessions and four feedback sessions in mother's homes. The program consists of behavioral parenting strategies, such as the use of contingent praise and token economies, plus cognitive principles, so that mothers could identify and interrupt dysfunctional parenting-related cognitions and attributions ("I'm a failure as a mother"). CBFI was evaluated against an intervention consisting of the behavioral components only (Behavioral Family Intervention: BIF). Both interventions were effective in reducing mothers' depression and children's disruptive behavior. However, the CBFI demonstrated additional benefits in that 6 months post intervention, families showed concurrent clinically reliable reductions in maternal depression and child disruptive behavior than families in the BIF intervention.

Other family-focused programs for children and their depressed parent employing a cognitive behavior approach can be seen from Germany (*EFFEKT-E*: Bühler, Kötter, Jaursch, & Lösel, 2011), Finland, (*Let's Talk*: Solantaus, Paavonen, Toikka, & Punamäki, 2010), and the USA (the *Family Group Cognitive-Behavioral*

*Prevention Intervention*; Compas et al., 2011; *Keeping Families Strong*; Riley et al., 2008). The overall aim of these programs is to strengthen the parent-child relationship and provide psychoeducation about parental depression and the effect of depression on children. While all programs have been evaluated using randomized controlled trials (RCTs), and demonstrate promising results, they have yet to demonstrate long-term sustained change in participants.

Other family-oriented programs can be found not limited to parental depression but instead designed for families where a parent has any severe and/or chronic mental illness. From the Netherlands, *Child Talk* is a two- to three-session program that aims to provide information to families about the parent's disorder and improve parenting and competence in children aged 2–23 years (van Doesum & Koster, 2009). *Family Options* is a US rehabilitation program, where Family Coaches conduct individually tailored meetings with families, focusing on multiple domains (Nicholson et al., 2009). The goals of the program are to enhance community networks and maintain the family's desired level of well-being. While children's outcomes are not as yet available, results demonstrate significant improvements in mothers' social support and well-being (Nicholson et al.). Finally, in Australia, the *Family Care Model* is a care coordination model for individual families where a parent has a dual diagnosis and their under 18 years of age children. Early results demonstrate that over the 12- to 18-month program families make progress to their nominated goals (Reupert, Maybery, & Goodyear, 2010). The striking feature among this group of family programs is that strategies are tailored to meet the individual needs of family members, drawing on formal and informal community supports.

Another commonly reported form of intervention for children whose parents have a mental illness are peer support groups, which can be found in Australia (Goodyear, Cuff, Maybery, & Reupert, 2009), the USA (Riebschleger, Tableman, Onaga, Rudder, & Whalen, 2009), Germany (Dierks, 2001), the Netherlands (van Doesum & Hosman, 2009), and Canada (Richter, 2006). The aim of these programs is for children

to learn more about mental illness and well-being and practice adaptive coping skills in a group format. The programs also provide an opportunity for children to talk about and share their experiences with other children living in similar circumstances. While mostly quasi-evaluation methodologies have been employed (in Australia at least), with results shown to be promising, more rigorous evaluation is required in this area, to establish the efficacy of this approach (Reupert & Maybery, 2009a).

### **What Does Not Work**

Children living in families in which a parent has a mental illness have lives that are complex and multifaceted and unique to each family and individual. Given the range of risk and protective variables that impact on children's outcomes, it is erroneous to believe that all children will require or want the same intervention. Thus, there needs to be various interventions on offer to fully meet the needs and competencies of children and their parents.

As well, not all children will be necessarily suited to all available interventions. One peer support program found that some children fared worse, post intervention (Goodyear et al., 2009). Specifically, the difficulties and emotional subscale scores on children's Strengths and Difficulties Questionnaire (SDQ) increased, rather than decreased, post intervention. For this program, however, it must be noted that prescores for this particular group of children on the SDQ identified a clinically unwell group of children, suggesting the intervention was not suited for children who are clinically unwell. Indeed for other children, who were clinically well, evaluation data were promising. Overall, such evaluation information indicates that there needs to be different types of interventions, depending on the mental health status of the presenting child. Additionally, there needs to be greater specificity in interventions for different family groups and for children with different ages and offered at different times because needs and strengths in families change over time.

Moreover, given the importance of family in the development of children, it may be ineffective to provide an intervention that focuses only on the child. Children's parents; other family members, including siblings and extended family members; and community and school networks and supports all need to be acknowledged in terms of impacting on children's outcomes. This means that any assessment of risk and resilience needs to assume a broader ecological view of the child, which will then ensure that appropriate referrals and/or interventions can be delivered (Steer, Reupert, & Maybery, 2011).

## Summary

While there are repeated calls for interventions that engage children in their environmental context (Nicholson, 2009; Reupert & Maybery, 2009b), the schism between research, policy, and practice is wide, to the point that children living in families where a parent has mental illness are often considered "invisible" by those clinicians treating their parents (Fudge & Mason, 2004). It is clear that there needs to be a fundamental shift in the way that programs are developed for these families, with a particular emphasis on early intervention. Despite the heterogeneity of interventions, some common factors can be identified across programs for families where a parent has a mental illness that aim to either minimize risks for families or promote protective and resilience factors. The repeated message here is that there needs to be multimodal focus of intervention that focuses on multiple stakeholders.

In the first instance, it is imperative that clinicians identify the parenting status of their clients by asking the question, "Do you have children?" While there are a number of workforce barriers (emulating from the policy, the organization, and the clinician; Maybery & Reupert, 2009), intervening with family members, especially children, is crucial, as contributors to a client's treatment and in terms of early intervention for children.

Acknowledging and celebrating the role of the parent is at the core of many family-focused

interventions. When working with parents, clinicians need to provide appropriate, sensitive, and timely assessment and intervention that focus on his/her mental illness and parenting role. Parents need to be sensitively informed about the impact of their mental illness on parenting behavior and their children, without feeling blamed but in a manner that acknowledges the strengths they bring as a parent to their children. When feeling unwell, parents might need support in their parenting role, especially around practical issues of running a household and child care.

Strategies directed to stabilizing the family unit are also important. Thus, planning for potential crises such as a parent being hospitalized or becoming very unwell can assist in managing, averting, or minimizing potential stress for the family. Establishing a crisis plan involves negotiating with stakeholders what needs to occur in a time of crisis, such as where a child might stay if his/her parent is hospitalized. Children need to be actively involved in this process, as they are often the first to identify early warning signs in their parent and need to know who to contact for themselves and for their parent (Reupert, Green, & Maybery, 2008).

Another common feature across various programs is the provision to children of accurate and developmentally appropriate knowledge about a parent's mental illness. Beardslee and Podorefsky (1988) found that resilient young people whose parent had depression were able to distinguish between themselves and their parents' illness and, importantly, appreciated that they were not the cause of their parents' illness. Such data underscore the importance of informing children about their parent's mental illness and providing this at several points over their childhood, in recognition that young people will require additional information and have different questions as they mature.

Most existing interventions target parental depression, and so other interventions need to be developed and evaluated for families where a parent has disorders other than, or in addition to, depression. Perhaps it is not surprising that there are limited program evaluations for families,

given the importance funders and government bodies place on the traditional RCT program evaluation paradigm. RCTs are complex but typically involve two or more groups being randomly allocated to different interventions. Groups are tightly controlled so that participant variables are the same (e.g., they all have the same disorder) and each participant within a certain group receives the same intervention. Families where a parent has a mental illness vary in terms of their needs and strengths and where they are placed in the lifespan, and so program foci vary, as Nicholson (2009, p. 223) points out: “A multimodal intervention may be provided in different doses or levels of intensity for different families or even different family members within the same family”. Thus, it is difficult to consider how family-focused programs might “fit” an RCT model. Indeed, it has been argued that RCTs are less sensitive to contextual issues and unanticipated causal factors that typically exist in community settings (Patton, 2008). As well, many clinicians lack the knowledge, resources, and time to implement RCTs (Reupert et al., 2009). Alternative though equally rigorous forms of program evaluation are required, with a particular focus on building research-community partnerships (Nicholson, 2009), though such activities need to be supported with time, funding, and resources.

In sum, it is crucial that there are procedures in place to identify the parenting status of clients and, rather than assume on the basis of parental mental illness alone, to sensitively screen for competence and need across various domains, such as parenting, child well-being, family dynamics, and social support. At a minimum, clinicians should at least be referring parents and/or children to appropriate services if required, for either early intervention support and/or treatment. Parenting support, education to children about mental illness, as well as opportunities for families to openly discuss what the parent’s mental illness means for each member of the family also need to be made available, depending on a family’s need and the context from which the service is provided.

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### Further Reading

- The Australian Children of Parents with a Mental Illness (COPMI) site provides resources to families and clinicians working with families where a parent has a mental illness. Retrieved November 8, 2012, from <http://www.copmi.net.au/>
- The Social Care Institute for Excellence in the UK has developed an e-learning resource regarding the nature of parental mental health and its impact on families. Retrieved November 8, 2012, from <http://www.scie.org.uk/publications/elearning/parentalmentalhealthandfamilies/index.asp>
- In the USA there is FAMpod (Families Preventing and Overcoming Depression) that provides information about the Beardslee program and parental depression generally. Retrieved November 8, 2012, from <http://fampod.org/>
- A template for crisis plans “Supporting Our Family Kit” can be downloaded from COMIC, (Children of Mentally Ill Consumers) Adelaide, Australia. Retrieved November 8, 2012, from <http://www.howstat.com/comic/>
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## Healthy Development in Children with Autism Spectrum Disorder

Patrick Chambers<sup>1</sup> and Douglas Frye<sup>2</sup>

<sup>1</sup>Department of Psychology, Northwestern University, Evanston, IL, USA

<sup>2</sup>University of Pennsylvania, Philadelphia, PA, USA

### Introduction

Autism is a pervasive developmental disability marked by deficits in communication, symbolic or imaginative activities, and reciprocal social interaction (Maurice, Green, & Luce, 1996). Though the cause of autism is unknown, it is widely presumed to be a biological disorder stemming from atypical neurological development. The diverse range of symptom severity and cognitive ability that can accompany a diagnosis of autism is acknowledged with the term autism spectrum disorders (ASD), which includes classic autism, Asperger's syndrome, Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS), Rett's syndrome, and childhood disintegrative disorder. Children with autism spectrum disorders are a heterogeneous population. They display various levels of cognitive ability and symptom severity, but they share a universal impairment in social and communicative ability that compromises social and emotional development.

Increased awareness and broadened diagnostic criteria have contributed to a surge in ASD diagnoses over the last decade, and autism is being studied extensively from scientists in multiple disciplines, including neurologists, epidemiologists, and behaviorists, to develop an understanding of the cause of, and optimal treatments for, ASD. There remains a great deal of mystery surrounding ASD, but science has uncovered important strategies for promoting social and emotional development in children with ASD. Overcoming the impairments and harnessing the strengths associated with ASD is a challenging task; therefore, parents must be

aware of warning signs, diagnostic procedures, and effective interventions in order for the child to be put in the best possible position for healthy lifespan development.

### Definitions and Scope

A diagnosis of childhood autism (also known as classic autism) is made by a clinician through behavioral criteria set by the DSM-IV (2000) that includes items of qualitative impairment in social interaction (such as lack of eye-to-eye gaze and facial expression) and communication (lack of conversational language and social imitative play), as well as the presence of restricted, repetitive, and stereotyped patterns of behavior, interests, and activities (such as hand flapping, nonfunctional routines, and persistent preoccupation with parts of objects). The onset of these delays or impairments occurs prior to 3 years of age. Similar criteria have been set by the World Health Organization, ICD-10 (World Health Organization [WHO], 1993).

Individuals with Asperger's syndrome display symptoms of autism, such as poor motor skills, bizarre interests, and impaired communicative ability, but demonstrate average or above average cognitive ability and no clinically significant delay in language (American Psychiatric Association, 2000). Asperger's is often referred to as high-functioning autism (Frith, 2003).

Other autism spectrum disorders may show some symptoms of classic autism, such as childhood disintegrative disorder, in which the child develops normally, but have severe regression in language, cognitive ability, and motor skills at age 3–10 years. Rett's syndrome, a genetic disorder reported almost entirely in girls, is characterized by normal development that is followed by regression in hand skills, speech, and cognitive ability at 7–24 months. Individuals with Pervasive Developmental Disorder-Not Otherwise Specified (PDD-NOS) also demonstrate some symptoms of autism, but not enough to fulfill the complete diagnostic criteria to be diagnosed as having classic autism or Asperger's. The upcoming DSM-V will eliminate Asperger's

syndrome and PDD-NOS by consolidating them into one category: autism spectrum disorder. This reclassification has created controversy within the autism community, as it may lead to a more restrictive diagnosis (Carey & Harmon, 2012).

Further complicating our understanding of ASD is the fact that it is often, but not necessarily, accompanied by other developmental disabilities such as mental retardation, attention deficit disorder, gastrointestinal issues, motor coordination disorder, and hypo- or hypersensitivity. The remainder of this entry considers the ASDs of childhood autism, Asperger's syndrome, and PDD-NOS. Rett's syndrome and childhood disintegrative disorder, while classified as being on the autism spectrum, have specific characteristics, outcomes, and treatments that are different from the other ASDs (Levy & Hyman, 2008) so they are not reviewed here.

### Scope

The exact prevalence of ASD's is unknown, but Kim et al. (2011) analyzed six studies and found estimated rates ranging from 0.07 % to 1.8 %. Epidemiological research has demonstrated a dramatic increase of prevalence rates over the past 20 years. Autism was once estimated at 0.002–0.004 % of the population (Lord & Rutter, 1994). The increased prevalence appears to be attributable to greater public awareness, broadening ASD diagnostic criteria, lower age at diagnosis, and diagnostic substitution (Fombonne, 2008). Essentially, parents and clinicians today have a better understanding of autism spectrum disorders than previous generations, and consequently, children are being diagnosed on the autism spectrum who may not have been years ago.

### Theories

There are countless theories across multiple disciplines that attempt to explain the cause of autistic symptomatology (see section "[Current Research](#)"); however, this section will focus on a small scope of well-recognized ASD theories

that directly relate to social and emotional development.

The social cognitive characteristics of autism spectrum disorder are commonly associated with having a deficit or delay in theory of mind, that is, the ability to infer mental states to others. Children with ASD have demonstrated lower performance levels on theory of mind tasks than children with Down's syndrome and younger neurotypical children with lower mental ages (Baron-Cohen, Leslie, & Frith, 1984; Sodian & Frith, 1994). Frith (2003) refers to the act of theory of mind utilization as "mentalizing" because it is an automatic and intuitive process for most people. However, mentalization does not come intuitively to individuals with autism, which explains their difficulty in understanding the thoughts and feelings of other people. The lack of theory of mind ability, or "mindblindness" (Baron-Cohen, 1995), is universal to varying degrees in all individuals on the autism spectrum, and it may explain impairments in other domains such as relationship building, intention, and social learning.

Another core symptom of autism is delayed and impaired language. There are a multitude of linguistic impairments that are commonly associated with autism, such as echolalia, delayed speech, pronoun reversal, and problems with inflection and articulation (Tager-Flusberg, Paul, & Lord, 2005); however, the most prominent characteristic of autistic language is impairment in pragmatics or conversational skills. This impairment can be further broken down into failure to understand the point of nonliteral messages, a narrower range of linguistic function, and a failure to view narratives as a means of communication (Tager-Flusberg, 2000). Though many high-functioning autistic individuals display a large lexical semantic vocabulary, pragmatic impairment is present in some degree to all individuals on the autism spectrum. Conversation skills are additionally difficult for children on the autism spectrum, as they often have an impaired ability to read facial expressions and make appropriate eye contact and personal space (Frith, 2003).

The impaired pragmatic and mental state language ability and mindblindness found in individuals with ASD appear to overlap. Essentially, if an individual cannot infer someone else's mental state, having a conversation will be quite challenging. Evidence of mindblindedness is first seen in a lack of shared gaze, which is a form of joint attention in infancy (Charman et al., 1997). Joint attention is extremely important to communication development because it is an understanding of others as intentional agents, and the language delay found in children with ASD could be related to a lack of infant joint attention.

Children on the autism spectrum engage in a variety of bizarre interests and behaviors. For example, young children with ASD often line up or stack their toys, rather than play with them, and watch segments of movies, instead of the entire film. The interests of children on the spectrum are often narrow and limited to unusual topics, such as ceiling fan switches or weather patterns. If the child is able to communicate, these interests will tend to dominate their end of the conversation. Stereotypic behaviors, such as hand flapping and rocking, are often present in children on the autism spectrum. These abnormal interests and behaviors, combined with impairments in mental state understanding and conversational skills, make it difficult for children on the autism spectrum to develop appropriate peer relationships.

## Current Research

### Neurology

Autism is considered to be a neurologically based disorder, so scientists are examining the brains of ASD individuals and their family members to gain insight into potential neurological abnormalities. Using functional magnetic resonance imaging, Kaiser et al. (2010) recently discovered a pattern of brain activity that may characterize genetic susceptibility to ASD. By examining the brains of children with autism, their unaffected siblings, and neurotypical controls, the authors found patterns of reduced activity in certain areas of the brain for ASD children and their siblings, as well as enhanced activity in other

brain areas found only in the sibling group. The authors believe that this enhanced activity may act as compensatory mechanism that allows the child to overcome their genetic predisposition to develop ASD.

Neurological researchers are also exploring the role of the mirror neuron system in social impairment. The mirror neuron system is the brain circuit that appears to enable individuals to understand the actions of others, and there is debate over whether or not a faulty mirror neuron system is responsible for the social learning impairment in ASD. Bastiaansen et al. (2011) examined mirror neuron activity during facial recognition tasks and found evidence that the mirror neuron system of ASD individuals is not impaired, but rather it is delayed. These findings coincide with developmental delays found in autism and place importance on early social stimulation that could promote timely mirror neuron activation.

Autism is characterized by an impairment in theory of mind ability, though the basis of this impairment is widely debated (Frith, 2003). Young, Camprodon, Hauser, Pascual-Leone, and Saxe (2010) provided neurological evidence that representational beliefs are controlled by an area of the brain known as the right temporoparietal junction (rTPJ) by using transcranial magnetic stimulation (TMS) to disrupt the rTPJ during moral judgment tasks. The authors found that participants who received TMS were less likely to rely on the actors' mental states than controls. By isolating the region of the brain responsible for representing mental states, scientists can begin focusing on interventions that will improve neural activity in this region and potentially lessen the theory of mind impairment in ASD individuals.

### Nature Versus Nurture

The age-old scientific question of genetics versus environment is being extensively examined in relation to the cause of ASD. The California Autism Twin Study (Hallmayer et al., 2011) assessed twin pairs in which at least one child had an ASD diagnosis (54 identical pairs and 138 fraternal pairs) and found a 70 % overlap

among identical twins and a 35 % overlap among fraternal twins. The authors also used modeling to estimate that shared environmental factors may account for 58 %, while genetic heritability accounts for 38 % of ASD liability. These findings suggest an interactional relation between heredity and environment in the development of ASD.

### Environmental Toxins

The role of environmental toxins in contributing to ASD development has also been a popular topic in the last decade. Wakefield et al. (1998) claimed evidence that linked autism to the mercury found in MMR vaccinations, which contributed to a global debate over the safety of vaccines. Wakefield's study was found to have multiple ethical violations, the article has since been retracted, and Hornig et al. (2008) report that 20 epidemiological studies since Wakefield et al. (1998) have failed to demonstrate a causal link between MMR vaccine and ASD. Nevertheless, the possible link between environmental agents and autism remains important, as recent epidemiological studies have found correlational evidence between autism prevalence and prenatal exposure to mercury (Palmer, Blanchard, Stein, Mandell, & Miller, 2006), air pollutants (Windham, Zhang, Gunier, Croen, & Grether, 2006), and antidepressants (Croen, Grether, Yoshida, Odouli, & Hendrick, 2011). More research is needed before any definitive causal link can be claimed.

### Early Identification

Autism spectrum disorder interventions are most effective when implemented at an early age, so research in early identification is crucial to ensuring that intervention can be implemented as early as possible. Studies in genetics and neurology are beneficial in this regard because they help identify children who are at risk. Recent behavioral investigations have contributed to early detection by providing evidence for behavioral markers that can be found in infancy. In a review of early investigations, Tager-Flusberg (2010) found no evidence that infants who will receive a future ASD diagnosis demonstrate any clear

differences from their neurotypical peers at age 0–6 months; however, a set of behavioral markers are demonstrated between the ages of 6–12 months that, taken together, can predict future ASD diagnosis. These may include repetitive motor movements (Iverson & Wozniak, 2007), atypical looking at objects (Ozonoff et al., 2008), and reduced social interest (Ozonoff et al., 2010). Research in early identification, including infant behavioral criteria, is essential to making sure that the child will be eligible for treatment as early as possible, thereby giving the child the best chance at healthy lifespan development.

### Overview of Strategies

It is important to remember that children with ASD are a heterogeneous population; therefore no singular approach to treating autistic symptomatology can be recommended. However, there are general strategies that parents of children with ASD should follow in order to promote optimal social development.

### Learn the Warning Signs

Parents should be aware of early signs of ASD, as infants who will receive a future ASD diagnosis may demonstrate behavioral markers as early as 6 months of age (Tager-Flusberg, 2010). According to the Centers for Disease Control and Prevention [CDC] (2010), these behaviors may include:

- Not responding to their name by 12 months of age
- Not pointing at objects to show interest (point at an airplane flying over) by 14 months
- Not playing “pretend” games (pretend to “feed” a doll) by 18 months
- Avoiding eye contact and want to be alone
- Trouble understanding other people's feelings or talking about their own feelings
- Delayed speech and language skills
- Repeating words or phrases over and over (echolalia)
- Giving unrelated answers to questions
- Getting upset by minor changes
- Having obsessive interests

- Flapping hands, rocking their body, or spinning in circles
- Having unusual reactions to the way things sound, smell, taste, look, or feel

### Seek Diagnosis

Parents should contact their child's pediatrician if the child is exhibiting signs of ASD. The pediatrician will then refer the family to a developmental pediatrician, neurologist, psychiatrist, or another mental health professional who specializes in the diagnosis of ASD. The specialist uses a battery of behavioral criteria for diagnosing ASD and often utilizes professionals from multiple disciplines, such as audiologists, speech language pathologists, and occupational therapists to assess any additional developmental complexities.

### Understand Legal Rights to Services and Education

According to the Individuals with Disabilities Education Improvement Act (IDEA) of 2004, all children, even those with disabilities, are entitled to a "free appropriate education" in the "least restrictive environment." The act requires states to locate children with disabilities so they can be evaluated to receive special education services, a policy known as "Child Find" (20 USC 1412(3)). If the child is determined to have met this definition and is between 3 and 21 years old, then he or she is entitled to publicly funded services under an Individualized Education Program (IEP). If the child is age three or over and is showing signs of ASD, parents should contact the district immediately because, under IDEA, they have the right to have the school assess the child and bear the cost of that assessment. Ideally, children who demonstrate signs of ASD will already be diagnosed and enrolled in services before age three. If so, parents should contact their school district 6 months before the child's third birthday so that the transition to publically funded service will not be interrupted.

### Choosing the Right Intervention

Since the cause of autism is still unknown, there is no definitive prevention method. This situation

has led to an overwhelming abundance of options for parents, as over 100 interventions have been identified in the United States (Green et al., 2006). There are many initiatives that claim effectiveness, but too often they are not empirically validated through scientific testing. Considering the behavioral problems associated with ASD, parents are often desperate to seek a "cure," and there are many proponents of pseudoscientific methods that profit from these desperate parents (Maurice et al., 1996). In order to sift through ineffective treatments, parents should rely on empirical testing and evidence-based conclusions.

Callahan, Henson, and Cowan (2008) surveyed parents, teachers, and administrators of children with autism and asked them to identify specific components of a model hypothetical intervention program. Their results yielded consistent support for interventions that addressed what the authors referred to as IDEAL: individualized programming, data collection, the use of empirically demonstrated strategies, active collaboration, and a focus on long-term outcomes. Below is a list of primary and complimentary interventions categorized using IDEAL principles as effective, promising, and ineffective. As ASD children are a heterogeneous population, the right treatment (or combination of treatments) should be customized based on the needs of the individual, as well as the established efficacy of the intervention.

## What Works

### Discrete Trial Teaching

Discrete Trial Teaching (DTT) is a behavioral strategy that is based on the principles of Applied Behavioral Analysis (ABA), which involve the breakdown of skills into small, discrete tasks, taught in a highly structured and hierarchical manner (Maurice et al., 1996). DTT therapists teach, or "shape," behaviors through one-on-one reinforced discrete trial instruction. The purpose of DTT is to create an active learning environment that can restructure developing neural circuitry. Though DTT is not specific to autism, it

addresses ASD-impaired social learning by teaching the individual to focus on another person, especially the person's words and interactions, thereby creating an active social learning environment (Maurice et al.). Critics of DTT claim that the shaped behaviors are not generalizable, and the treatment was once considered highly controversial for its inclusion of aversives (a practice that has since been removed).

DTT was first popularized by Lovaas (1987), who found that participants receiving DTT gained an average of 30 IQ points over the control group, and that 47 % of the treatment group achieved normal intellectual and educational functioning, and were able to successfully complete first grade in mainstream public schools (as compared to 2 % of the control group). The results of Lovaas were extraordinary. Subsequent DTT studies have shown them to be atypically positive. Nevertheless, a recent meta-analytic DTT review indicates that the intervention results in increased levels of adaptive behavior and cognitive ability (Reichow & Wolery, 2009).

DTT is a data-driven intervention, making it easy to study. Because of its empirical support and the lack of empirical support for other interventions, DTT remains one of the most popular and influential interventions for autism.

### **Pivotal Response Treatment**

Pivotal Response Treatment (PRT) is a naturalistic intervention that also derives from ABA principles, but unlike EIBI, PRT focuses on critical or "pivotal" areas of child development that encompasses a multitude of behaviors, rather than targeting discrete trials and individual behaviors. It is based on the principle that intervention in areas such as motivation, responsivity, and social initiations will lead to widespread improvements in social and communicative development. PRT is implemented through child choice, task variation, interspersing maintenance tasks, rewarding attempts, and the use of direct and natural reinforcers (Koegel, Koegel, Harrower, & Carter, 1999). This adherence to direct natural reinforcers in PRT is a differentiating characteristic from EIBI. For example, a child in EIBI might receive a piece

of candy as reinforcement for initiating a verbal request for a ball, whereas in PRT the ball itself would be the reinforcer. PRT has not been as data driven as EIBI, but there are several empirical studies supporting its efficacy in social communication (Baker-Ericzen, Stahmer, & Burns, 2007; Koegel et al., 1999; Pierce & Schreibman, 1997).

### **TEACCH**

Treatment and education of autistic and related communication-handicapped children (TEACCH) is an autism-specific behavioral therapy designed to create a highly structured learning environment. TEACCH is based on a philosophy known as "the culture of autism," that is, the pattern of neuropsychological deficits and strengths associated with ASD individuals (Mesibov, Shea, & Schopler, 2005). Accordingly, TEACCH adapts to meet the needs of this "culture" by placing emphasis on highly organized teaching areas, visual schedules of learning activities, work systems that inform students of their progress, and identification of within-task actions (Mesibov et al., 2005).

TEACCH has been demonstrated to be an effective treatment for individuals with autism. Studies have found improvement in the amount of communication and appropriate engagement with materials (Short, 1984); imitation, fine motor, gross motor, and nonverbal conceptual skills (Ozonoff & Cathcart, 1998); and Psychoeducational Profile-Revised (PEP-R) and Vineland Adaptive Behavior Scales (VABS) scores (Ozonoff & Cathcart; Panerai et al., 2009).

### **Medicinal Intervention**

Behavioral and educational interventions are often the primary treatment for children with ASD; however, medical treatment is often used as an adjunct. It has been reported that more than 45 % of children with an ASD are treated with psychotropic medication (Rossignol, 2009). Despite this level of utilization, comprehensive medical management reviews in ASD are lacking (Huffman, Sutcliffe, Tanner, & Feldman, 2011). Currently, the only FDA-approved medication for treatment of ASD is the antipsychotic



risperidone. In a review of medical management studies in ASD, Huffman et al. (2011) found that risperidone has been demonstrated to safely reduce ASD core symptoms, as well as maladaptive behavior, hyperactivity, and irritability, but may include side effects like weight gain and sedation. The authors also found empirical support for methylphenidate, a psychostimulant that has been demonstrated to be effective in reducing symptoms of inattention and hyperactivity in children with ASD, though response rate is lower than neurotypical children with ADHD.

## Promising Primary Interventions

### Floortime

Floortime (also referred to as the Developmental Individual Difference Relationship-Based Model) is a promising non-autism-specific behavioral intervention that is organized around the child's emotions and relationships in the context of their current developmental level (Greenspan & Wieder, 1997). It is used as an intervention for ASD children, as an impaired ability to form relationships is a core symptom of ASD. Floortime is built heavily upon engaging play, with the therapist or parent following the child's lead. For example, the Floortime model would address a child's stereotypic wandering in circles by having the therapist wander along with occasional stops in the child's path, thereby creating an interconnected experience (Greenspan & Wieder, 1997).

Greenspan and Wieder (1997) administered Floortime intervention to a group of 200 children with ASD (age 2–4 years) and found that after 2 years of intervention, 58 % of the children showed improvements and no longer met the criteria for ASD. The results are encouraging; however, the study has several methodological weaknesses including a sample of convenience and no control group and therefore must be interpreted with caution. Presently, no rigorous empirical studies have been published, so Floortime's effectiveness as an intervention can only be considered promising.

## Promising Complimentary Treatments

### Social Stories

Social Stories is a set of brief, individualized stories designed to help people understand social situations (Sansosti & Powell-Smith, 2008). The story describes a situation, as well as the thoughts and feelings of the involved characters. The goal is to increase insight that will help guide future social behavior, by simulating isolated situations through storytelling. Numerous studies have demonstrated improved social ability in ASD children (Quirnbach, Lincoln, Feinberg-Gizzo, Ingersoll, & Andrews, 2009; Sansosti & Powell-Smith, 2008) but more tightly controlled studies are necessary to understand the role of social stories.

### Vitamins

Vitamin B6 and magnesium has been a popular treatment for autism over the past 20 years, though more research is necessary to determine its effectiveness. Kuriyama et al. (2002) reported improvement in IQ and social quotient scores in 8 children treated with vitamin B6 and magnesium, and Mousain-Bosc et al. (2006) studied 33 children with ASD who were reported to improve in symptoms after magnesium and vitamin B6 treatment.

Vitamin C therapy is also a popular treatment, despite findings that children with ASDs do not typically suffer from a severe lack of Vitamin C (Adams & Holloway, 2004). Dolske, Spollen, McKay, Lancashire, and Tolbert (1993) reported a decrease in stereotyped behavior in a 30-week, double-blind, placebo-controlled trial in 18 children with ASD. To date, this study has not been replicated. Studies in vitamin therapy and autism have yielded some positive results, but most suffer from methodological weaknesses; therefore, more clinical trial research is necessary to establish its effectiveness.

### Music Therapy

Music therapy is often used as tool for improving communication in special education programs. Though effects on overall behavior have not been established, music therapy has been found

to improve spoken and gestural communication in children with autism compared to controls (Gold, Wigram, & Elephant, 2006).

### **Gluten-/Casein-Free Diets**

Gastrointestinal disorders are commonly reported in individuals with ASD, though exact prevalence rates are incompletely understood (Buie et al., 2010). Comorbidity of GI and ASD can lead to additional challenging behaviors for children, so specialized diets, such as ones without gluten and casein, that alleviate GI issues may be used as an effective complimentary treatment. There is no evidence that supports gluten-/casein-free diets as a primary treatment for ASD, and evidence of its effectiveness in treating ASD symptoms is largely anecdotal (Buie et al.). Given the lack of evidence, as well as the difficulty in implementing these diets, ASD children must be given a thorough GI evaluation before parents attempt this treatment.

## **What Does Not Work**

### **Holding Therapy**

For decades, autism was thought to be the result of inattentiveness from the child's mother, a phenomenon referred to as "refrigerator mothers" (Bettelheim, 1967). This theory has since been discredited, but the idea that creating appropriate attachment between the mother and child in order to alleviate ASD symptoms continues to persist. Holding therapy is a treatment based on this psychoanalytic principle, in which the parent holds the child for periods of time while attempting to make eye contact, even if the child is resistant. There is no empirical evidence of treatment efficacy, and considering that hypersensitivity to touch is common in ASD children (Frith, 2003), holding therapy is not recommended.

### **Facilitated Communication**

Facilitated communication (FC) is a method designed to assist individuals with communication disorders communicate through the use of a keyboard device. It involves an FC therapist, or

"facilitator," who holds the individual's hand or arm to assist them in typing messages on the device. It has been used as a treatment for ASD children because of suspected childhood apraxia of speech, a disorder of the brain and nervous system in which the child cannot physically communicate their thoughts. FC was popularized mainly through encouraging parental testimonials, including reports of "I love you" sent by the child, but studies have found that the messages generated by FC are biased by the facilitators and could not be replicated when facilitators were blind to the subject matter (Herbert, Sharp, & Gaudiano, 2002).

### **Chelation**

As researchers continue to search for potential environmental causes of autism, treatments that remove potentially harmful toxins from the body are becoming an increasingly popular treatment for ASD. Chelation is the process of administering intravenous agents that bind heavy metals, such as mercury and lead, and assist removal of these metals from the body. There are no empirical studies that have established efficacy of chelation treatment for children with ASD. Chelation therapy also has side effects that include nausea and hypocalcemia, and a botched chelation therapy given to a 5-year-old boy resulted in death (Atwood, Woeckner, Baratz, & Sampson, 2008).

## **Summary**

Autism is a pervasive developmental disability marked by deficits in communication, symbolic or imaginative activities, and reciprocal social interaction. Children with autism spectrum disorders are a heterogeneous population, displaying various levels of cognitive ability and symptom severity, but sharing a universal impairment in social and communicative ability that compromises social and emotional development. These social impairments, combined with the presence of abnormal interests and behaviors, make it difficult for children on the autism spectrum to develop appropriate peer relationships.

Though the cause of autism is still unknown, recent research provides evidence that genetics and environment, specific neurological activity, and environmental toxins may all play a role in the development of ASD. This understanding is becoming increasingly vital, as epidemiological research has demonstrated a dramatic increase of prevalence rates over the past 20 years.

Parents should be aware of early signs of ASD, as infants may demonstrate behavioral markers as early as 6 months of age. Families of children with ASD must also become familiar with the process of seeking and obtaining a diagnosis, as well as their legal rights to services and education. When choosing an intervention, parents must base their decision on empirically validated methods, as there is an abundance of pseudoscientific treatments for ASD. Methods such as DTT, PRT, and TEACCH have demonstrated effectiveness, while Floortime and social stories are examples of promising treatments. Holding therapy and chelation are treatments that should be avoided.

This entry has largely focused on the social impairments associated with ASD, but it is important to also recognize the strengths. Individuals with mild autism struggle socially but are often skilled, even prodigious, at mathematical and analytic reasoning ability required in science and engineering fields (Frith, 2003). There are countless examples of successful individuals on the autism spectrum and even more who exist on the often-blurred line between mild autism and creative eccentricity. ASD is a serious condition, and the social learning impairments can have lifelong detrimental effects. But when the right strategies are utilized, including early assessment and a commitment to effective intervention, children with ASD can go on to live independent and enriching lives.

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## Healthy Development of Children in Nuclear Families

Kevin Ray Bush and Gary W. Peterson  
Department of Family Studies and Social Work,  
Miami University, Oxford, OH, USA

### Introduction

Although nuclear families decreased substantially in the USA during the latter half of the twentieth century and the first decade of the twenty-first century, families with a mother, father, and biologically related children remain a common setting for socializing the young (Carlson, McLanahan, & England, 2004; Cherlin, 2005; Teachman, Tedrow, & Kim, 2013). Current family structures vary extensively and include many combinations of parents, children, parental roles, legal ties, and blood relations.

Compared to alternative family forms, two parent families have often been found to provide modest advantages that benefit the positive development of children. However, rather than specific kinds of family structural variation being the primary reason for advantage or disadvantage, children's psychosocial differences are more often linked to the greater socioeconomic obstacles and fewer support systems that are a more common circumstance for alternative families (Bianchi & Casper, 2000; Coontz, 2000, 2005; Peterson & Bush, 2013; Teachman et al., 2013). The most frequent alternative to "structural explanations" for differences in children's socialization outcomes, however, is substantial empirical support for the view that sociopsychological aspects of parent-child relationships are more relevant to children's prosocial or problematic outcomes than are family structural variables (Bush & Peterson, 2008; Peterson & Hann, 1999). Consequently, effective prevention strategies are less often designed to address family structural variations per se, but instead, the most effective approaches seek to improve the quality of parent-child relationships. These enhancement efforts often take the form of directly

improving parental socialization strategies that foster children's social competence. A closely related strategy is to provide supports to parents so they, in turn, are able to maintain effective childrearing approaches as they cope more effectively with crises and adverse circumstances of everyday life (Bush & Peterson, 2008).

### Definitions and Scope

The concept *social competence* is viewed as a set of attributes or psychological resources that assist children in adapting to their everyday social circumstances and in developing coping abilities for warding off problematic behavior (i.e., externalizing and internalizing behavior) (Bush & Peterson, 2008, 2013). Social competence is composed of multiple subdimensions including (1) balancing progress toward autonomy with continuing emotional bonds and receptivity to the influence of parents, (2) psychological or cognitive resources (e.g., self-esteem, problem-solving skills, achievement orientation), and (3) social skills (e.g., cooperation and social assertiveness) (Bush & Peterson, 2013; Peterson & Hann, 1999).

*Internalizing and externalizing behavior*, two general categories of problematic outcomes, can be viewed as collections of attributes that are contrary to social competence (Bush & Peterson, 2008, 2013). Externalizing behaviors refer to psychological difficulties in the form of behavior problems (e.g., conduct disorder) in which children "act out" against parents and society. In contrast, internalizing behaviors involve psychological disturbances in which children focus on and act against the self (e.g., depression, social withdrawal, anxiety).

*Authoritative or competence-promoting parenting* consists of parenting that involves the consistent application of nurturance and firm control to encourage an age-appropriate balance between gaining autonomy and continuing responsiveness to parental/adult authority by the young (Bush & Peterson, 2013). Competence-promoting parents focus on reinforcing prosocial behavior, clearly communicated expectations,



firm and consistent rule enforcement, use of positive induction, and the provision of a secure base from which to grant autonomy.

## Theories

A number of theoretical approaches have been influential in developing and/or guiding prevention programs aimed at increasing children's positive outcomes in general, as among nuclear families as the focus of this entry. Theories that focus solely or mainly on nuclear families have not been influential in this area. However, ecological approaches such as Bronfenbrenner's Ecological Systems Theory (1979, 2005), which is sensitive to multidirectional influences and all levels of the contextual environment, are common. Ecological approaches relate to and/or have influenced several school and family-based multicomponent prevention programs (e.g., Families and Schools Together, Crozier, Rokutani, Russett, Godwin, & Banks, 2010; McDonald, Bradish, Billingham, Dibble, & Rice, 1991). That is, the most comprehensive way of conceptualizing family-based prevention strategies is to view parent-child relationships within nuclear families as subcomponents of much larger social environments. In this sense, nuclear families may provide a cleaner fit to family systems-based models, yet ecological models are broad enough to apply across family structural organizations. These ecological perspectives can provide insight for a broad range of prevention strategies aimed at levels of society ranging from dyadic relationships within nuclear families (e.g., parenting programs) to macro-level institutions (e.g., social policy) (Bronfenbrenner, 1979, 2005; Tudge, Mokrova, Hatfield, & Karnik, 2009). Thus, children are viewed as being nested within a complex array of interconnected systems that encompass individual, family, and extrafamilial (e.g., peer, school, and neighborhood) settings. Both problematic and socially competent outcomes are viewed as products of dynamic exchanges between children and their diverse settings in addition to the interconnections among the social systems in which children

develop (Bronfenbrenner, 1979, 2005; Tudge et al., 2009).

Several developmental theories, including social learning theory and attachment theory, also are relevant and can be used to specify particular parent-child dynamics within the larger social ecology. For example, social learning theory focuses on modeling and interactions within parent-child relationships, where socially competent behaviors are developed and reinforced. Similarly, dysfunctional and non-nurturing parenting behaviors can also influence dysfunctional child behavior and development, such as internalizing and externalizing behaviors, which in turn influence parenting behavior (e.g., Bandura, 2001), and can develop into coercive cycles (Patterson, 1982; Granic & Patterson, 2006). Attachment theory also highlights the importance of parent-child interactions in the development of attachment styles, where poor or dysfunctional parenting behaviors are likely to result in poor attachment (e.g., insecure) styles, while nurturant and responsive parenting behavior are more likely to result in positive attachment (e.g., secure) styles (Ainsworth & Bowlby, 1991; Bowlby, 1988; Bretherton & Munholland, 2008; Cassidy, 2008).

## Current Research

Among the growing variety of domestic contexts, the nuclear family continues to serve as a principal context for socializing children and is a prime target for prevention programs aimed at increasing positive and decreasing negative child outcomes. Although many evidence-based programs exist that focus on family interaction to prevent poor child outcomes, an approximate estimate is that only 10 % of the programs implemented by practitioners have adequate scientific support (Kumpfer, 2008). Definitions that specify what an effective program consists of vary widely, making it difficult for practitioners to identify the most effective programs to use. As a result, this entry seeks to identify illustrative programs having strategies found to be effective (i.e., in at least three randomized control trials)

for targeting family/parenting processes that prevent problematic children's outcomes and foster children's social competence.

*The Incredible Years.* The first of these programs, the Incredible Years (IY), consists of a series of three interventions that target changes in (1) parenting behavior, (2) children's social-emotional regulation, and (3) teacher's classroom management skills and teacher-child interaction. Although originally designed for promoting social competence and reducing, treating, and preventing conduct problems in children aged 3–8, recent studies also have found that each component also is effective in decreasing children's internalizing problems (Herman, Borden, Reinke, & Webster-Stratton, 2011; Webster-Stratton & Herman, 2010). The IY Parent Training (PT) program focuses on parent competence and school involvement (Webster-Stratton & Herman). Parents are taught to model positive attitudes and thoughts as they encourage prosocial behaviors and social skills, as well as how to work with teachers and schools to foster children's academic performance.

The IY Teacher Training Program (TT) focuses on disrupting negative cycles in teacher and peer interactions/relationships. The TT program is a 6-day training that focuses on decreasing negative peer relationships (e.g., bullying, negative reputations) and conduct problems, while increasing the emotional regulation and social competence of children in school. The program targets improving classroom management strategies and teaches coaching strategies to help teachers/school staff foster positive relationships among children and improve children's social skills. Teachers and other school staff are taught collaborative problem-solving processes, positive communication and relationships with parents, the value of home visits, and the importance of parent-teacher conferences (Webster-Stratton & Herman, 2010).

The IY Child Training program (CT), referred to as the Dinosaur School, is an 18–22 weekly, 2-hour, small group therapeutic program. The Dinosaur School CT targets social, communication, and conflict management skills; negative

attributions; and emotional literacy (Herman et al., 2011). The CT works well with the Parent Training (PT) and Teacher Training (TT) IY programs, such as through weekly letters to teachers and parents about encouraging the reinforcement of targeted skills, and homework assignments that children complete with their parents.

*Families and Schools Together.* The second program, entitled Families and Schools Together (FAST), is composed of unique multiple domains (i.e., families and schools) that also involves the community context. FAST is a two-stage prevention program seeking to improve child and family outcomes by focusing on the improvement of parenting skills, parent-child relationships, and child and family outcomes through building relationships with community and schools supports (McDonald et al., 1991, 1997, 2006). Although FAST has been adapted for several age groups, including the Baby FAST version (McDonald et al., 2009), most of the RCT studies have focused on implementations of Kids FAST (K-5) with elementary school students. The components of these implementations consist of an 8-week set of multifamily group meetings (lasting approximately 2½ hour each), followed by monthly meetings for 1–2 years (Ackley & Cullen, 2010; Kratochwill, McDonald, Levin, Scalia, & Coover, 2009).

Core components of FAST include a shared governance approach, active recruitment and retention, collaboration with community agencies, as well as parents and schools as active partners (Ackley & Cullen, 2010). Implementation begins with the creation of a collaborative team who are culturally sensitive to the context and population being served by involving individuals from community agencies and schools as well as the parents of participating families. The composition of the implementation team is likely to vary somewhat across locations/sites as they are based on local needs assessments conducted by the implementing agency (Kratochwill et al., 2009).

*The Triple P.* The third program, referred to as the Triple P or Positive Parenting Program, is a complex multiple level system of interventions

designed to increase effective parenting and decrease dysfunctional parenting for families of children from 2 to 16 (Sanders, Markie-Dadds, & Turner, 2003). Sanders et al. (2003) provide a table describing the five levels of the Triple P system. Level one is the universal Triple P that uses a “media-based parent information campaign” which targets “all parents interested in information about promoting their child’s development” (Sanders et al., p. 2). Methods include self-directed resources such as fact sheets and other media strategies as well as brief consultations and group presentations. Levels two and three vary from brief selective interventions to more narrow-focused consultation or active skills training, typically in the context of routine well-child health care. Most of the RCT studies with the Triple P have been conducted with the level four and five programs. Level four interventions utilize broad-focused parent training models, including the Standard Triple P, Group Triple P, Group Teen Triple P, and the Self-Directed Triple P Programs. These programs focus on parents of children with more severe behavior problems who want intensive training in competence-promoting parenting to improve their child’s behavior (Sanders et al.). Both level four and level five strategies can vary from being self-directed to phone or face-to-face clinician contact or group sessions. Level five interventions are the most intensive and consist of the Enhanced Triple P and Pathways Triple P behavioral family intervention modules. The Enhanced Triple P intervention targets “parents of children with concurrent child behavior problems and family dysfunction such as parental depression or stress or conflict between partners” and includes home visits (Sanders et al., p. 2). The other level 5 intervention, the Pathways Triple P, targets parents of children at risk for child maltreatment, focusing on parent’s anger management and other parental skill deficits that place children at higher risk for being maltreated. More information and detail on the Triple P (Positive Parenting Program) system can be obtained from the Triple P (n.d.) website (<http://www1.triplep.net/>), including links to evaluation studies.

## Overview of Strategies

A review of the literature consisting of prevention trials, meta-analyses of prevention trials, reviews of the literature, and reports from expert panels reviews (e.g., Kumpfer & Alvarado, 2003) highlights evidence for several effective prevention approaches or strategies for preventing or decreasing problematic outcomes during childhood applicable to nuclear families. Effective primary prevention strategies include skills training, behavior monitoring and reinforcement, and behavioral techniques for classroom management. Effective secondary prevention strategies include parenting training, home visitation, social skills problem-solving, and cognitive/thinking skills programs. These strategies vary from targeting parents, children, teachers, or communities, including multicomponent programs that combine approaches. Various methods of implementing these strategies are used such as, media campaigns that disseminate self-directed resources and intensive parent and teacher training programs delivered by trained therapists, facilitators, or teachers who follow manuals and a standardized curriculum.

Child training (CT) approaches focus on promoting children’s protective factors and buffering children’s risk factors such as through social-emotional skills training and typically take place in school. Parent training programs (PT) focus on facilitating cognitive, affective, and behavioral changes in parents through teaching skills to increase effective communication, engage in positive play with their child, and develop effective child management strategies. PT programs typically are offered at schools or community locations but also during home visits. Teacher training (TT) programs focus on enhancing teacher-child and teacher-parent relationships through teaching classroom management skills and encouraging communication/work with parents.

In addition to effective strategies, steps must be taken to ensure appropriate and effective implementation of the program. Besides a well-designed evaluation study, implementation should include removal of attendance barriers.

Common approaches include the provision of reminders, transportation, child care, and even meals. The cultural context must also be considered, such as approaching the appropriate person in the family for permission/recruitment as well as ensuring that the curriculum itself is culturally sensitive/appropriate for the target population.

## What Works

Several strategies were identified that have been found effective in at least three RCT studies. Evaluations have found the parent training (PT), teacher training (TT)/classroom behavior management programs of the Incredible Years (IY) program to be effective. In a recent article describing the research related to the IY program, Webster-Stratton and Herman (2010) summarize results indicating the program to be effective in decreasing child conduct problems, co-occurring child depressive symptoms, harsh parenting, and increasing positive parent-child interaction and parenting attitudes. More specifically, the PT component of the IY has been found to be effective in seven RCT studies by Webster-Stratton and colleagues with 2- to 8-year-olds. For example, a recent RCT study indicated positive evidence for improving children's internalizing problems (Herman et al., 2011) and externalizing problems (Webster-Stratton & Herman, 2010).

Specific to the teacher training IY program, three RCT studies have been conducted as it was implemented as part of the IY series of programs (See Webster-Stratton & Herman, 2010). For example, in one RCT comparing a child component and teacher component with and without this teacher program, teachers who participated were more nurturing and consistent than controls. Moreover, children in the participating teachers' classrooms were more cooperative and less aggressive than children in classrooms of control teachers. Results from a similar RCT reveal that children in classrooms with program-participating teachers had increases in prosocial behavior and on task behavior and had lower levels of aggression.

A unique multicomponent prevention program with three RTC studies indicating effectiveness is the Families and Schools Together (FAST) program (McDonald et al., 1991, 2006). The FAST combines several strategies including, social skills training, parent training, home visitation, academic tutoring, and classroom behavior management. Several RCT studies for the Kids FAST program have revealed successful results and program effectiveness with elementary school children (Kratochwill et al., 2009; Kratochwill, McDonald, Levin, Young Bear-Tibbetts, & Demaray, 2004; McDonald et al., 2006). Although conducted with a small sample of 50 Native American school children, compared to controls, 4- to 7-year-olds who participated in FAST had lower levels of aggressive and withdrawn behavior at posttest (Kratochwill et al., 2004). An analyses at 1-year follow-up indicated that FAST participants had maintained less withdrawn levels and exhibited higher academic competence. Similarly, in a study of children (first through fourth grades) from low-income Latino families, the FAST children ( $n = 80$ ) fared better than the children in the control group ( $n = 50$ ) (McDonald et al., 2006). More specifically, the 2-year follow-up revealed that the FAST group scored significantly higher on academic achievement and lower on externalizing behavior compared to children in the parent education control group.

In a more recent study, Kratochwill et al. (2009) found that the 67 FAST children (K-3) scored higher on family adaptability than controls. A 1-year follow-up analysis indicated that although family adaptability scores declined in both groups, FAST participants had significantly less decline compared to controls. Additionally, FAST participants experienced a statistically significant reduction in externalizing behaviors compared to control group members (Kratochwill et al.). Thus, based on these three RCT studies of the FAST, positive effects for academic achievement remained at least 1 year post for 2 of the 3 RCT studies. Externalizing behaviors were lower than controls for 2 of the 3 RCT studies at least 1 year post.

Twenty-nine manualized RCT studies have been conducted and demonstrated the efficacy and effectiveness of the Triple P (Positive Parenting Program) system (Nowak & Heinrichs, 2008). Most of these RCTs have been conducted with the level four (standard) and five (enhanced) programs. In a comparative RTC of a level four program, level five program, and a wait-list control, both programs were found to be effective (Bor, Sanders, & Markie-Dadds, 2002). Parents of 87 preschoolers with co-occurring disruptive behavior and attentional/hyperactive problems participated in one of the three groups. Those in the level four and level five groups experienced significantly lower levels of child behavior problems, dysfunctional parenting, and higher levels of competence-promoting parenting. A key finding was that contrary to expectations, the enhanced program (level 5) was not superior to the standard program (level 4).

A more recent RCT study found a level four program, with the addition of a work-family balance component, to be effective among a group of 62 working parents of 1- to 16-year-olds (mean of 6.6) in a large metropolitan area in Australia (Sanders, Stallman, & McHale, 2011). The work-family balance component targeted difficult areas for working parents, such as key transition times (departure to work and arrival home). Parents were taught cognitive and affective strategies for coping with stress and dysfunctional attributions. Parents who participated in the combination of the level four program and work-family balance component scored significantly lower than nontreatment controls at post-test on anxiety, stress, and dysfunctional parenting and significantly higher on work satisfaction and work commitment, with moderate to large effect sizes.

### What is Promising

Results for two RCT studies of the IY Child Training (CT) program (See Webster-Stratton & Herman, 2010) suggest much promise for program effectiveness. One RCT study compared the IY CT, the IY PT, and a control group to

a group receiving both the PT and CT. Children experiencing the CT alone were found to improve their conflict management and problem-solving skills compared to children who received only the PT and those in the control group. Children receiving both the PT and CT, however, experienced the most improvements at the 1-year follow-up assessment.

Another promising program is the level one universal Triple P, which primarily focuses on parent education. This program uses a “media-based parent information campaign” ranging from dissemination of fact sheets to media messages targeting parents who are interested in fostering their child’s development (Sanders et al., 2003, p. 2). A recent RCT study found positive impact of this program on reducing population indicators of child maltreatment for this universal program for families of children from birth to 8 years of age (Prinz, Sanders, Shapiro, Whitaker, & Lutzker, 2009).

### What Does Not Work

Many nicely packaged a-theoretical programs are marketed to and used by many schools, organizations, and family providers. However, since most of these are not tested empirically and/or the results are not published, it is difficult to accumulate evidence and prove the particular program does not work. When determining which strategies or programs are not effective, many considerations must be made, including proper implementation and fidelity. That is, taking evidence-based programs that have been developed in controlled and well-funded settings, and maintaining the fidelity of the program is not always easy and must be considered. The literature search for this entry focused mainly on RTC studies and did not find any family-focused programs that were found to be ineffective. However, there were many programs for which RTC studies were not found. One of the more well-researched ineffective prevention programs for children is the traditional curriculum for the Drug Abuse Resistance Education (DARE) program, which has been shown to be ineffective



(West & O'Neal, 2004). Critiques of DARE include that the implementation targets children too young (five and six grades) before they can understand peer dynamics and peer pressure, as well as not including social skills training.

## Summary

Multicomponent ecological approaches that implement several strategies (e.g., skills training, behavioral classroom training, behavioral monitoring and management) appear to be emerging as a best practice. Although single-strategy approaches such as a parent training program have been found to be effective on their own, studies have found advantages to implementing multiple strategies. For example, the implementation of all three IY component programs leads to additive effects as they simultaneously address multiple risk factors of children's internalizing and externalizing behavior. A multicomponent approach can function, therefore, to increase protective factors such as children's social competence, nurturing and consistent parenting, positive teacher-child interactions, and positive family/parent-school/teacher relations.

The three family-focused interventions targeting the improvement of children's social competence and preventing internalizing and externalizing programs highlighted here show great promise, but much more work is needed. More specifically, although each of the three programs have similar goals, the approaches vary (and each with pros and cons) but have been found to be successful. Despite this success, there is a lack of RCTs examining the comparative effectiveness of these three programs. There is also a lack of examinations of multicomponent programs (targeting children) for cost-effectiveness, an essential task in these times of economic hardship. There has, however, been work in both of these areas regarding family-focused prevention programs for adolescents (see ► [Healthy Development of Youth in Nuclear Families](#) in this volume), which can serve as a model to examine these issues within prevention programs targeting children.

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## HIV/AIDS During Early Childhood

Deborah H. Cornman<sup>1</sup>, Katelyn Sileo<sup>2</sup> and Blair T. Johnson<sup>3</sup>

<sup>1</sup>Center for Health, Intervention, and Prevention (CHIP), University of Connecticut, Storrs, CT, USA

<sup>2</sup>Department of Community Medicine and Health Care, University of Connecticut, Farmington, CT, USA

<sup>3</sup>Department of Psychology, Center for Health, Intervention, & Prevention (CHIP), University of Connecticut, Storrs, CT, USA

### Introduction

Human immunodeficiency virus (HIV) and other sexually transmitted infections (STIs) are among the most common infectious diseases today, with over 25 STIs having been identified now. Individuals become infected with STIs through contact with infected body fluids during sex, sharing of injection drug equipment, pregnancy and delivery, or breastfeeding. The impact of STIs varies widely across diseases, from little or none (e.g., scabies, pubic lice) to moderate (e.g., human papillomavirus virus [HPV], gonorrhea) to life-threatening (e.g., HIV, syphilis). These diseases affect men and women of all backgrounds, ages, and economic levels, presenting wide-ranging challenges for public health around the world.

The STI that currently presents the greatest challenge worldwide is HIV, which causes AIDS, a disease that progressively destroys the body's ability to fight infections and certain cancers and usually results in death. Although healthy individuals rarely succumb to these "opportunistic" infections, the weakened immune systems that characterize people with AIDS render them more susceptible to infections and less able to fight them off. Concurrent infection with other STIs weakens their immune system even more and worsens their prognosis. Yet the use of antiretroviral medications can prevent or delay the onset of AIDS and significantly prolong the life span of those who are living with HIV.

Due to the seriousness of the HIV pandemic, the current entry and the four that follow it will focus primarily on prevention of HIV, with less attention given to other STIs. Generally, though, prevention of HIV is similar to prevention of many of the other STIs, so many of the HIV prevention recommendations that appear here logically extend to other STIs. It is important to note that preventive recommendations for HIV and other STIs vary widely across the life span, owing to both the different routes with which these diseases can be acquired (e.g., sharing drug injection equipment vs. mother to child vs. sexual intercourse) and the differing cognitive capacities of the targeted group (e.g., infants vs. adolescents vs. adults vs. the elderly).

### Definitions and Scope

Approximately 2.5 million of the estimated 33.3 million people currently living with HIV are children less than 15 years of age (Joint United Nations Programme on HIV/AIDS, 2010). During 2009 alone, 370,000 children became newly infected with HIV and 260,000 children died from AIDS. Over 90 % of these HIV-infected children are living in Africa, with the highest prevalence rates in sub-Saharan Africa (Joint United Nations Programme on HIV/AIDS). The Joint United Nations Programme on HIV/AIDS estimates that over 90 % of HIV-infected children become infected perinatally, or through mother-to-child transmission (MTCT), at the rate of 1,000 children per day. These children acquire the virus either in the uterus (antepartum), at the time of labor and delivery (intrapartum), or during breastfeeding (postpartum). Studies show about half the transmissions occur in the days before delivery and during labor, with another third occurring during the actual passage through the birth canal in late labor; infection in early pregnancy is relatively infrequent (Kourtis, Lee, Abrams, Jamieson, & Bulterys, 2006). Of those children who become infected with HIV, about half of them die before they are 2 years of age if they do not receive any treatment for HIV (World Health Organization [WHO], 2010a).

Prior to the advent of antiretroviral (ARV) medications and other strategies for the prevention of mother-to-child transmission, approximately 15–30 % of infants born to HIV-infected women became infected during pregnancy and delivery, and another 5–20 % became infected during breastfeeding (De Cock et al., 2000). Consequently, perinatal transmission rates in countries where breastfeeding was not the primary infant feeding method, such as Europe and the United States, were significantly lower (15–30 %) than the rates in breastfeeding countries such as South Africa (20–45 %).

## Theories

The vast majority of HIV prevention research with very young children has focused on how to prevent the transmission of HIV from mother to child during pregnancy, labor, delivery, and breastfeeding. This has resulted in research with a predominantly biomedical focus with minimal use of health behavior theories.

## Research

### Prevention of Mother-to-Child Transmission

The prevention of mother-to-child transmission (PMTCT) of HIV has been one of the greatest successes in the field of HIV. It comprises a set of highly effective biomedical and behavioral interventions that have significantly improved both maternal and child health (WHO, 2010a).

**ARV Medications.** The ability of ARV medications to reduce the risk of MTCT was first discovered in the Pediatric AIDS Clinical Trials Group (PACTG) 076 trial, a study examining the effectiveness of zidovudine (AZT) in preventing MTCT of HIV (Connor et al., 1994). The treatment regimen consisted of the use of AZT by the mother during pregnancy and labor (intravenously delivered to the mother) and by the infant for a period of 6 weeks during the postpartum period (syrup formulation delivered to the newborn). This groundbreaking study revealed that the risk of perinatal HIV transmission was

reduced by two-thirds with the use of this three-step AZT regimen, from 25 % in infants of women who received the placebo to 8 % of infants in women who received AZT. This regimen, paired with increased testing and counseling, became the standard of care throughout the 1990s in the United States and Europe, leading to rapid declines of transmission in the developed world. The PACTG 076 study was followed in 1999 by a meta-analysis demonstrating that the combination of the three-step AZT regimen with a cesarean section performed before the onset of labor reduced the MTCT rate even further to 2 % (International Perinatal HIV Group, 1999). Subsequent to this finding, studies found that administering a combination of three antiretroviral (ARV) medications to pregnant women and performing a cesarean section only on women with viral loads greater than 1,000 copies/mL decreased the MTCT rate to between 1 % and 2 % (e.g., Shapiro et al., 2010).

**Combination Therapy.** Combination therapy is now considered to be the most effective therapy available for the prevention of mother-to-child transmission. With the widespread availability of ARV medications in developed countries, combination therapy has played a major role in nearly eliminating MTCT of HIV in North America and Western Europe (Lopez-Cortes et al., 2007; Mofenson, 2004). Use of these medications along with other PMTCT interventions has the potential to reduce the risk of MTCT to 5 % or less in developing countries where breastfeeding is the primary infant feeding method (WHO, 2010a), but such a decline has not occurred because of the regimen's expense and complexity of usage (Mofenson & McIntyre, 2000).

Consequently, several simpler and less expensive short-course antiretroviral regimens were developed for use in resource-poor countries. A single dose of nevirapine (sd-NVP), given to the mother at the onset of labor and to the infant after birth (Guay et al., 1999; Jackson et al., 2003), became the most widely used intervention to prevent mother-to-child transmission in resource-limited settings and continues to be used in many settings. Though it is less effective

than administration of combination therapy, sd-NVP has been found to decrease transmission by nearly half (Guay et al., 1999; Jackson et al., 2003) and to be much more feasible in resource-limited settings due to its relatively low cost and easy administration.

While the administration of sd-NVP has been shown to be effective at reducing the risk of transmission to infants in settings that could not otherwise provide mother-to-child interventions, there is now substantial evidence of the development of drug resistance when on this regimen. Studies found that about a third of the women taking sd-NVP developed drug resistance as did approximately half of the infants exposed to sd-NVP by the time they were 6–8 weeks of age (Arrive et al., 2007); development of drug resistance is a potentially serious problem that can make subsequent treatment less effective.

Based on these findings, researchers explored alternative regimens that balanced feasibility in resource-limited settings with safety and levels of resistance. The research indicated that starting women on AZT in the third trimester of pregnancy, providing a single dose of nevirapine at the onset of labor, giving them a combination of two ARV medications (AZT+ lamivudine [3TC]) during delivery and 1 week postpartum, and administering an ARV medication to infants for 1 week after birth not only more effectively reduced MTCT but also decreased the development of resistance by over 80 % compared to sd-NVP (McIntyre et al., 2009). The recommendation to administer ARV medications to newborn infants is grounded in recent research showing that prophylaxis use provided added protection to infants from HIV (Chasela et al., 2010), which is particularly important in situations where the mother has poor ART adherence, begins ART late in pregnancy, or has a high viral load (amount of HIV in the blood). In 2006, the World Health Organization (WHO) translated these research findings into new PMTCT guidelines entitled *Antiretroviral Drugs for Treating Pregnant Women and Preventing HIV Infection in Infants*, which included the aforementioned regimen as well as the recommendation that pregnant women with weakened immune systems

(CD4 count  $\leq$  200 cells/mm<sup>3</sup>) be provided with lifelong ART for their own health (WHO, 2006).

Because of the progress made on the development of simpler and more cost-effective regimens and the commitment of governments to expanding PMTCT programs, a greater number of pregnant women with HIV have access to ARV medications in low- and middle-income countries. According to the 2009 report, *Towards Universal Access: Scaling Up Priority HIV/AIDS Interventions in the Health Sector*, nearly half (45 %) of HIV-infected pregnant women in low- and middle-income countries received ARV medications in 2008 to prevent HIV transmission to their child. This represented a significant increase from 2007, when 35 % of pregnant women received medications, and from 2004, when only 10 % did (World Health Organization, Joint United Nations Programme on HIV/AIDS, & United Nations Children's Fund, 2009). However, this percentage remains well below the United Nations General Assembly Special Session (UNGASS) goal of 80 % of pregnant women and their children having access to ARV medications and other PMTCT services by 2010. The sub-Saharan African countries that have achieved the UNGASS goal of 80 % coverage (e.g., Botswana, Namibia, and Swaziland) have done so because of a strong national commitment to PMTCT and international support; this coverage has resulted in a significant reduction in new infant infections in these countries (WHO, 2010a).

## Strategies

To prevent the transmission of HIV from mothers to their children, WHO (2010a) promotes a four-pronged approach that includes (1) “primary prevention of HIV infection among women of child-bearing age,” (2) “preventing unintended pregnancies among women living with HIV,” (3) “preventing HIV transmission from a woman living with HIV to her infant,” and (4) “providing appropriate treatment, care and support to mothers living with HIV and their children and families.”

Since the vast majority of HIV-infected children acquire HIV from their mothers through perinatal transmission, the primary strategy for preventing pediatric HIV infection should be the prevention of HIV infection in women of child-bearing age. Because the majority of these women become infected through unprotected heterosexual intercourse, it is important to offer primary prevention programs that provide information about HIV/AIDS and its prevention, promote safer sex and the use of condoms, counsel women in family planning and avoiding unwanted pregnancies, offer routine testing for HIV, and provide access to facilities that can diagnose and treat other sexually transmitted infections that can significantly increase the risk of HIV transmission. In addition, policies and programs that are aimed at improving women's status in society should also be prioritized because women's social and economic vulnerability ultimately makes them and their children susceptible to HIV as well. These evidence-based prevention strategies that focus on keeping mothers free from HIV will not be discussed in this entry but will be described elsewhere in the book (see "► [HIV/AIDS During Adulthood](#)," by Lennon & Johnson).

The remainder of this entry will focus on current recommendations for preventing mother-to-child transmission once women become infected with HIV. It will discuss the most up-to-date, evidence-based guidelines around (1) the use of antiretroviral medications by the mother, during pregnancy, delivery, and following birth, and by the newborn, (2) infant feeding practices, and (3) delivery by cesarean section. It will include interventions that are feasible to implement in resource-limited settings.

## Strategies That Work

In 2010, WHO released new PMTCT guidelines based on what has been demonstrated to work in the abovementioned studies and other research. The new guidelines were developed in conjunction with the new WHO guidelines on adult and adolescent antiretroviral therapy (ART) and

pediatric ART, and they focus on how to most effectively use ARV medications and infant feeding practices to minimize the risk of HIV transmission from mother to child. Changes from the 2006 guidelines include the recommendations that pregnant women start ARV medications earlier, that women with relatively strong immune systems who do not need ARV medications for their own health take them longer prophylactically for the benefit of their infant, and that women take ARV medications while breastfeeding (WHO, 2010b). The Department of Health and Human Services (HHS) published additional guidelines for use in the United States that specify when to use cesarean delivery versus vaginal delivery for the birth of an HIV+ woman's infant (Panel on Treatment of HIV-Infected Pregnant Women and Prevention of Perinatal Transmission, 2010). These guidelines highlight the roles of resources possessed by individuals and their networks (Johnson et al., 2010).

### Antiretroviral Therapy

The latest WHO guidelines (2010b) on the use of ARV medications to treat pregnant women and prevent HIV infections in infants recommend lifelong ARV medications for HIV+ women in need of treatment for their own health (which also reduce mother-to-child transmission of HIV) and short-term use of ARV medications to prevent MTCT during pregnancy, delivery, and breastfeeding for HIV-infected women not in need of treatment. The guidelines indicate that the treatment options offered to a woman should be based on whether the woman needs ARV medications for her own health in addition to her infant's. To make this determination, it is critical for HIV+ pregnant women to be tested for their CD4 count, an indication of the strength of their immune system. Whereas the 2006 guidelines recommended starting women on lifelong ARV medications when their CD4 count fell below 200 cells/mm<sup>3</sup> (the point at which the immune system is typically no longer strong enough to prevent opportunistic infections), the current guidelines recommend doing so when the CD4 count drops to 350 cells/mm<sup>3</sup> or below.



Since women with a low CD4 count ( $\leq 350$  cells/ $\text{mm}^3$ ) are at greatest risk for transmitting HIV to their child, the use of ART during pregnancy and while breastfeeding is the most effective way to reduce the risk of mother-to-child transmission and infant death while also protecting the mothers' health. It is recommended that women with a low CD4 count start taking ARV medications daily as soon as possible, regardless of the gestational age of the fetus, and should continue to take them throughout pregnancy, delivery, and for the rest of their lives. The regimens recommended by WHO for pregnant women eligible for ARV medications are the same three-drug regimens recommended for nonpregnant HIV+ individuals. The decision about which regimen should be used should be made based on several factors including cost and operational feasibility within the country in which it is being administered.

HIV+ pregnant women with a stronger immune system (CD4 count above 350 cells/ $\text{mm}^3$ ) do not need to take ARV medications for their own health; however, they do need to take medications to prevent HIV transmission to their infant. WHO (2010b) provides two recommended drug options for women taking ARV medications for the health of their infant. Option A requires that the woman start taking AZT twice daily when she is 14 weeks pregnant (or as soon after as possible) and that she continue doing so throughout her pregnancy. When labor begins, the woman should be administered a single dose of nevirapine, and twice daily doses of AZT and 3TC should be started and continued for 7 days after the baby is born. Additionally, daily nevirapine (or twice daily AZT) should be administered to the infant for 6 weeks after birth if the infant is not breastfeeding. If the infant is breastfeeding, daily nevirapine should be continued until 1 week after breastfeeding has finished. Option B is a three-drug regimen for the mother to take during pregnancy and throughout the breastfeeding period. Additionally, the infant should take nevirapine daily for a period of 6 weeks after birth, regardless of whether the infant is breastfeeding. Option A is more likely

to be implemented in developing countries where resources are limited, while option B is usually offered to HIV+ women in high-income countries.

### **Breastfeeding**

The transmission of HIV through breastfeeding has been well established. It is estimated that 200,000 infants a year worldwide acquire HIV through breastfeeding (Chasela et al., 2010). Transmission via breastfeeding is much more prevalent among developing countries where breastfeeding is an extremely high-prevalence behavior; women in Africa, for example, typically breastfeed for about 2 years. In these developing countries where breastfeeding has been the norm, approximately one-third to one-half of all instances of mother-to-child transmission have occurred through breastfeeding (De Cock et al., 2000; Fowler & Newell, 2002).

The solution to this problem is straightforward in developed countries, where it is relatively easy for HIV+ mothers to avoid breastfeeding altogether and feed their infants with breast milk replacements such as commercial infant formula or homemade infant formula. In fact, this solution has been adopted by the majority of HIV+ mothers in these countries, which has contributed to a significant reduction of transmission through breastfeeding. In contrast, in developing countries where there are limited resources, finding viable and effective infant feeding solutions for HIV+ women is much more complex. Replacement feeding is often not feasible due to cost (e.g., breast milk substitutes are not affordable), practical considerations (e.g., nutritionally adequate substitutes are not consistently available, or there is no access to clean water for making the milk replacement), and cultural reasons (e.g., there is a stigma attached to not breastfeeding) (Coutsoudis, Goga, Rollins, Coovadia, & Child Health Group, 2002). Additionally, it has been well documented that breastfeeding contributes to both maternal and infant health. Breastfeeding prolongs the interval between births and helps to protect the mother from developing ovarian or breast cancer. For the child, breast milk provides the nutrition that the child needs in



order to thrive and grow. These nutrients can of course be supplied by acceptable milk replacements. However, milk replacements cannot replace maternal antibodies, which can protect the child against common childhood illnesses such as diarrhea, pneumonia, neonatal sepsis, acute otitis media, and other potentially fatal diseases (Bahl et al., 2005; Kuhn & Aldrovandi, 2010). Thus, having HIV+ women stop breastfeeding in resource-limited settings is often not an option and can be life-threatening to the infant.

WHO's 2010 revised infant feeding guidelines are based on a thorough review of the research literature and an attempt to "balance the risk of infants acquiring HIV through breast milk with the higher risk of death from causes other than HIV, in particular malnutrition and serious illnesses such as diarrhea, among non-breastfed infants" (World Health Organization, Joint United Nations Programme on HIV/AIDS, United Nations Population Fund, & United Nations Children's Fund, 2010, p. 16). In countries with sufficient resources to support healthy and sustainable replacement feeding, this is the recommended infant feeding method for HIV+ women and breastfeeding is to be avoided. In countries where breastfeeding is judged to be the best option and women have access to ARV medications, WHO and other international organizations (2010) recommend that women exclusively breastfeed for the first 6 months of an infant's life and then continue with mixed feeding (breastfeeding supplemented with complimentary foods) until the infant is 12 months old. They recommend stopping breastfeeding only when "a nutritionally adequate and safe diet without breast milk can be provided" (World Health Organization et al., 2010, p. 31). If a woman has access to ARV medications, she should take them for the duration of breastfeeding (and beyond if she is taking them to maintain her own health). Similarly, the infant should take ARV medications while breastfeeding and up until a week after breastfeeding ends. There is now ample empirical evidence to support the safety and effectiveness of ART during breastfeeding. More specifically, it has been shown to lower

postnatal transmission rates to below 1 % (Shapiro et al., 2010).

Evidence is so strong in support of the benefits of breastfeeding for mother and child that even for women who do not have ARV medications available, breastfeeding may provide infants with a higher chance of HIV-free survival (Kuhn & Aldrovandi, 2010; Slater, Stringer, & Stringer, 2010). Studies in developing countries have shown higher mortality rates among infants receiving mixed feeding or replacement feeding during the first 6 months of life than among infants exclusively breastfed by HIV+ mothers during the same time period (Homsy et al., 2010). Thus, in situations where the woman does not have regular access to ARV medications and cannot safely use replacement feeding, WHO currently recommends that women exclusively breastfeed for the first 6 months of an infant's life and then engage in mixed feeding between 6 and 12 months of age (WHO et al., 2010).

Research shows that there is little benefit to the infant from continuing to breastfeed beyond 12 months (Kuhn & Aldrovandi, 2010; Slater et al., 2010). Thus, combining breastfeeding with ARV medications offers the best balance of protection from morbidity and mortality and HIV transmission in developing countries. Regardless of whether or not women are taking ARV medications while breastfeeding, WHO recommends that when a woman weans her infant from breastfeeding, she should do it gradually over a 1-month period and not stop abruptly as doing so has been associated with adverse consequences for the infant, such as growth failure and diarrhea (Kuhn & Aldrovandi, 2010; WHO et al., 2010).

The 2010 WHO guidelines recommend that the national health authorities in each country decide which strategy will give infants born to HIV+ mothers the greatest chance of HIV-free survival: exclusive breastfeeding (hopefully accompanied by ARV medications) or replacement feeding and avoidance of all breastfeeding (WHO et al., 2010). Replacement feeding should not be recommended unless it is acceptable, feasible, affordable, sustainable, and safe in that country.

### Cesarean Section Versus Vaginal Delivery

Whether or not to deliver the infant of an HIV+ woman via cesarean section should be based on a consideration of the risks versus the benefits for that particular mother and child. Cesarean section can lower transmission rates by protecting the infant from direct contact with the mother's genital tract secretions and blood, which may contain HIV. However, cesarean deliveries are also accompanied by an increased risk of maternal morbidity and mortality compared with vaginal deliveries (Read & Newell, 2005); the risks include maternal hemorrhage (uncontrolled bleeding), infection, and other complications.

In the case of HIV+ women with viral loads above 1,000 copies/mL, the benefits of cesarean delivery are believed to outweigh the risks. A meta-analysis of data from 15 studies revealed a significant reduction (~50 %) in the risk of transmission to infants when they were delivered via scheduled cesarean from mothers with viral loads > 1,000 copies/mL (International Perinatal HIV Group, 1999). Based on this and other research, the Panel on Treatment of HIV-Infected Pregnant Women and Prevention of Perinatal Transmission (2010) recommends scheduled cesarean delivery at 38 weeks gestation for HIV+ women with viral loads above 1,000 copies/mL near the time of delivery (irrespective of whether they were taking ARV medications during their pregnancy) and for women with unknown viral loads near the time of delivery. There is strong evidence supporting the benefits of elective cesarean delivery if it is performed *prior* to the rupture of membranes and onset of labor, but it is not clear whether cesarean delivery is beneficial for women who present with ruptured membranes or who are in labor.

Determining the mode of delivery for women with viral loads below 1,000 copies/mL is less straightforward. The recommendation that cesarean delivery only be considered for women with viral loads above 1,000 copies/mL was based largely on data from the Women and Infants Transmission Study (Garcia et al., 1999). Of the women in that study with viral loads below 1,000 copies/mL, not one transmitted HIV to her child. Subsequent studies, however, demonstrated that

HIV transmission can still occur even at very low viral loads and that cesarean delivery may help reduce the risk of HIV transmission (Ioannidis et al., 2001; Townsend et al., 2008). However, given the low rate of transmission among women with a low viral load, it is unclear whether cesarean delivery provides any additional benefit in terms of PMTCT. Based on these mixed findings, HHS currently recommends that the decision on mode of delivery for women with viral loads below 1,000 copies/mL should be individualized to the patient and decided between the woman and her physician.

Elective cesarean section is a viable option in the United States and in other developed countries, but it is not a feasible option for HIV+ women in most developing countries because of limited resources. Prior to implementing a policy of elective cesarean sections to reduce HIV transmissions to infants, it is critical to consider the costs and human resource implications of doing so.

## Strategies That Are Promising

### Immunization

Currently, researchers are examining immunization as a possible strategy for preventing mother-to-child transmission of HIV. Immunization is the process whereby a person is made resistant to an infectious disease, generally by the administration of a vaccine. Immunization has successfully been used with other viral infections, such as the hepatitis B virus, to prevent perinatal transmission. Given the challenges around implementing mother-to-child prevention services in resource-limited settings, an HIV vaccine that could prevent transmission from mother to child would have a tremendous impact globally, especially in developing nations. Although an HIV vaccine with demonstrated safety and effectiveness has not yet been developed for either children or adults, there are several ongoing trials evaluating vaccines that could have major implications for the future of mother-to-child prevention. Examples include HPTN 027 in Uganda and the PedVacc trial in Gambia

and Kenya, both of which are evaluating vaccines for the prevention of mother-to-child transmission during breastfeeding.

### **Minimizing HIV Transmission During Breastfeeding**

With respect to breastfeeding, there is some evidence that exclusive breastfeeding during the first 6 months of life not only reduces mortality among infants in developing countries but may also reduce the transmission of HIV from mother to child. A large study of over 4,000 newborn infants born to HIV+ mothers in Zimbabwe found that those who received mixed feeding were 2.6 times as likely to become HIV+ as infants who were exclusively breastfed (Iliff et al., 2005). The authors suggested that the reason for the difference may be because other foods can cause abrasions in the mucous linings of the infant's digestive tract, making it easier for HIV to enter the infant's bloodstream. Additional research is needed to confirm these findings.

Another promising strategy for reducing MTCT during breastfeeding is the use of heat-treated, expressed breast milk. There is laboratory evidence that heating expressed breast milk from HIV+ mothers, if done correctly, can inactivate HIV (e.g., Israel-Ballard et al., 2007). Several different heating methods have been tried and none of the methods appears to affect the nutritional or immunological composition of breast milk (Chantry et al., 2009; Israel-Ballard et al., 2008). Therefore, this appears to be a potentially effective method for HIV+ mothers to safely provide HIV-free breast milk to their infants. However, there is a limited amount of empirical data supporting the acceptability and sustainability of using heat-treated breast milk, so WHO currently recommends it only as an "interim strategy" to be used during specific periods of time rather than the full duration of breastfeeding (WHO et al., 2010).

### **Strategies That Do Not Work**

In terms of ARV medications, it is recommended that efavirenz not be used to treat HIV+ pregnant women during their first trimester of pregnancy

because of potential risks to the fetus during that time. Animal data has revealed the possible risk to the fetus of blindness, absence of one or both eyes, facial clefts, and neural tube defects (resulting in lack of development of portions of the brain and/or spine) if the mother takes efavirenz during this critical period of fetal development (Panel on Treatment of HIV-Infected Pregnant Women and Prevention of Perinatal Transmission, 2010).

Regarding breastfeeding, evidence has demonstrated that cessation of breastfeeding prior to 6 months of age or mixed feeding (breastfeeding and supplementary food) during the first 6 months of life can be harmful to the health of infants who live in resource-limited settings. Research suggests that the first 6 months of an infant's life are a critical period in which the protective antibodies of breast milk are necessary for infant survival in developing countries. Infants born to HIV+ mothers who are weaned prior to 6 months or who are not exclusively breastfed during that period are more likely to contract diarrhea, vomiting, and gastroenteritis, which can be fatal (Homby et al., 2010; Kourtis et al., 2007; Onyango-Makumbi et al., 2010). A study in Uganda, for example, found a six-fold greater risk of death among infants born to HIV+ women who breastfeed for less than 6 months as compared to those who breastfed for 6 months or longer (Homby et al., 2010). These findings further highlight the significant health benefits of breastfeeding for infants in resource-limited settings.

### **Synthesis**

The primary mode of HIV acquisition for children 6 years of age and younger is perinatal or mother to child. Consequently, the most effective way to prevent HIV in young children is to prevent it in their mothers. If these prevention efforts are unsuccessful and the mother becomes infected, other interventions must be implemented to reduce the risk of transmission from mother to child. Currently, treating HIV+ women and their newborns with antiretroviral

medications has been demonstrated to be the most effective intervention available for the prevention of mother-to-child transmission. In developed countries, the use of three-drug regimens in the mother during pregnancy, delivery, and postpartum; use of prophylaxis medication administered to the infant after birth; and use of formula instead of breast milk to feed the infant have reduced the risk of MTCT to less than 2 % in developed countries.

This combination of interventions is not feasible, however, in many developing countries where resources are more limited and breastfeeding is critical to infants' survival. Consequently, simpler and less expensive short-course ARV regimens for the mother and child along with exclusive breastfeeding of the child for the first 6 months of his/her life are being recommended as a way to reduce HIV transmission to children in these countries. Although not as effective as the long-term use of combination regimens and replacement feeding, these interventions are having a significant impact on the prevention of MTCT.

The research in the area of PMTCT has underscored the importance of designing interventions that are customized to meet the needs of the individual within her culture. Developing an intervention that is biologically sound is useless if there are social, cultural, political, financial, psychological, and practical barriers that prevent its implementation. Although there continues to be a long way to go before mother-to-child transmission is eliminated worldwide, the evidence-based guidelines that the World Health Organization has recommended are an important step to reducing MTCT in both developed and developing countries.

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## HIV/AIDS During Childhood

Erika A. Montanaro<sup>1</sup>, Angela D. Bryan<sup>1</sup> and Blair T. Johnson<sup>2</sup>

<sup>1</sup>Department of Psychology and Neuroscience, University of Colorado Boulder, Boulder, CO, USA

<sup>2</sup>Department of Psychology, Center for Health, Intervention, & Prevention (CHIP) University of Connecticut, Storrs, CT, USA

### Introduction and Definitions

This entry reviews research and knowledge relating to the development and implementation of HIV/AIDS prevention programs for school-aged children (see definitions in Cornman, Sileo, and Johnson, (2013) in this encyclopedia). This entry reviews the scope of the problem and outlines the current recommendations for effective HIV/AIDS prevention programs for school-aged children between the ages of 6 and 12.

### Scope

UNAIDS, the Joint United Nations Program on HIV/AIDS, and the Global Fund's goal of virtually eliminating mother-to-child transmission of HIV by 2015 is within reach. From 2001 to 2009 mother-to-child HIV infection rates declined by 26 % (United Nations AIDS, 2010). However, there is still much more to be done to prevent the HIV/AIDS pandemic from affecting the world's children. United Nations AIDS estimates that over 370,000 children were infected with HIV in 2009 and 2.5 million children are currently living with HIV or AIDS. Many more children are affected by the epidemic in that they have lost their parents to the disease. To date, more than 16 million children have lost one or both parents to AIDS.

The picture is not so bleak in the industrialized world, but HIV/AIDS among children still presents a substantial public health threat. In the USA, the number of pediatric AIDS cases has

been reduced dramatically, from 195 cases reported in 1999 to only 57 reported in 2005 (Centers for Disease Control and Prevention, 2007). This decrease is largely due to the use of antiretroviral (ARV) prophylaxis during pregnancy among HIV-positive (HIV+) women. Despite these advances, the CDC estimates that over 9,500 children under the age of 13 are currently living with HIV or AIDS (Centers for Disease Control and Prevention, 2008). More important from a prevention standpoint, a large percentage of HIV infections are detected in early adulthood (e.g., 21–30 years). Given the latency from infection to detection of the HIV virus, these figures suggest that patterns of risk behavior established in late childhood and early adolescence place young people at high risk for HIV infection later in life. For these reasons, United Nations AIDS (1997) urged that HIV prevention programs, and particularly school-based HIV prevention programs, be implemented “at the earliest possible age, and certainly before the onset of sexual activity” (p. 2). Recent reports in the USA suggest that average age of first intercourse is approximately 17 years old (Alan Guttmacher Institute (AGI), 2002), and in higher-risk groups, such as criminally involved adolescents, first intercourse occurs much earlier, between the ages of 12 and 14. Thus, both parents and schools must undertake HIV prevention efforts, preferably before children reach the age of 12; these efforts can have the added benefit of protection from sexually transmitted infections (STIs). The focus of this entry is the current state of HIV prevention efforts for these young people. Specifically, we review HIV prevention programs for children between the ages of 6 and 12. Given the extremely high costs associated with HIV/AIDS in both economic and personal terms, it is crucially important to start prevention programs early so as to avoid as many infections as possible.

### Theories and Research

Despite the importance of HIV/STD prevention for school-aged children, theories directed

towards this group remain poorly developed. Moreover, the vast majority of all HIV prevention programs for young people, and particularly school-based programs, have been conducted with adolescents of high school age (see White and Johnson (2013) in this encyclopedia). We could find only one example of a program conducted with school-aged children: Schonfeld et al. (1995) designed and implemented an AIDS education curriculum in a randomized controlled trial in one elementary school. The participants were children in grades ranging from kindergarten to 6th grade, and the program was developmentally tailored. The educational program involved discussions of general concepts of illness (e.g., germs, the immune system) followed by a specific discussion of the transmission and prevention of HIV and the progression of AIDS. This program was successful at increasing conceptual understanding of HIV transmission and prevention and did not increase fears about HIV/AIDS among the children. Schonfeld et al. concluded that young children are indeed capable of understanding and processing factual information regarding HIV transmission and prevention.

Based on this program and those conducted with adolescents (White & Johnson, 2013), some conclusions regarding the development of effective HIV prevention programs for school-aged children are reasonable. First, the CDC guidelines for Effective School Health Education to Prevent the Spread of AIDS (Centers for Disease Control and Prevention, 2003) recommend that HIV preventive interventions are most likely to be effective when they are integrated into a health education curriculum. The overall health education curriculum should emphasize the strong connection between personal behavior and health in all domains (e.g., sexual behavior, exercise, nutrition, substance use). Such an integrative approach to health education is expected to foster an early belief in the controllability of health outcomes later in life.

In a review of 20 years of school-based sexuality education, Kirby (1999a) concluded that simply imparting correct knowledge about sex, contraception, and disease prevention has been

shown to be insufficient to influence risk behavior, a conclusion that squares with meta-analytic evidence (Johnson, Scott-Sheldon, Huedo-Medina, & Carey, 2011). While behaviorally relevant information regarding HIV transmission and prevention is a necessary component of an HIV prevention educational program (Fisher & Fisher, 2000), it is clear that increases in such knowledge are only weakly related to behavior. Thus, a focus on the complex set of skills necessary to manage sexual risk behavior becomes crucial. United Nations AIDS (1997) recommends a “life skills approach,” wherein young people are given the self-confidence and ability to handle risky situations in all domains, including that of sexual behavior (i.e., Gilchrist & Schinke, 1985). Importantly, the same findings applicable to all other populations targeted for HIV prevention appear to be true of school-aged children. Interventions that are theoretically and empirically based, and tailored to the population of interest, are most likely to be successful (Glanz & Maddock, 2000; Kirby, 1999b). Examples of theoretical underpinnings of successful HIV prevention programs for older adolescents and for adults include the *Theory of Reasoned Action/Planned Behavior* (Ajzen & Madden, 1986; Fishbein & Ajzen, 1980), *Social Cognitive Theory* (Bandura, 1992), and the *Information-Motivation-Behavioral Skills Model* (Fisher & Fisher, 1992). Central to each of these theories is the notion that information alone is not enough and that in order to engage in HIV prevention, individuals must have positive *attitudes* towards prevention, perceive *normative support* for prevention, perceive *skills* (i.e., self-efficacy) necessary to engage in prevention, and strong *intentions* to engage in preventive behavior.

At present, the exact content necessary to optimally promote each of these prevention components for children between the ages of 6 and 12 has not been empirically investigated. Of note is the work of Schonfeld et al. (1995), which only examined the effectiveness of their program for increasing factual knowledge. But it is clear that such children should have developmentally appropriate information designed to increase positive attitudes, normative support,

perceived self-efficacy, and intentions to engage in safer behavior. For example, a self-efficacy intervention component on the intricacies of negotiating condom use with a sexual partner, while crucial for teenagers, would be wholly inappropriate for a 10-year-old. Later in the entry, we review some suggestions made by developmental psychologists about what content an HIV prevention program for young children should contain.

A final theoretical perspective that is important when considering children's risk behavior is more ecological. *Problem Behavior Theory* (Jessor & Jessor, 1977; Jessor, Turbin, & Costa, 1998) asserts that there are multiple distal personality and environmental characteristics that serve as risk and protective factors and that often these factors do not have obvious, content-related similarity to the risk behavior at focus (Jessor et al., 1998). For example, Jessor and colleagues have shown that distal personality factors such as high self-esteem and environmental factors such as community service involvement serve as protective factors that decrease risky behaviors including early and unprotected sexual behavior (Jessor et al.). Similarly, Johnson et al.'s (2010) *Network Individual Resource Model* highlights how individuals are linked to multiple networks in resource-rich exchanges and that risk for HIV acquisition hinges not just on the individual but on the networks with which they are linked. Because they are vulnerable, children's risk levels for HIV usually hinge more critically on their families than on other networks. These perspectives suggest that factors that strengthen structures (e.g., improve family health, give a sense of hope for the future, and community involvement) ultimately protect younger individuals who can progress into adolescence and adulthood in good health and HIV negative.

## Overview of Strategies

The following outline of an age-appropriate HIV/STD prevention curriculum is taken partially from Pozen (1995, pp. 249–251) and from

Kirby (1999b, pp. 202–205; 2007) and includes suggestions from Schonfeld.

The outline also includes specific sample content based on each of the components of the Theory of Planned Behavior (TPB; Ajzen & Madden, 1986) in order to demonstrate how a theoretical model guides intervention content.

## What Works

### What Is Promising

The editors of the *Encyclopedia of Primary Prevention* define empirically evidenced studies (i.e., what works) as three or more successful trials of an intervention . . . that either prevents the dysfunction or promotes the health in individuals as relevant to our topic. Nevertheless, there is evidence for other interventions and strategies that – while not meeting the above criteria for school-aged children – yield considerable amounts of evidence among other populations and therefore are widely considered as empirically based. These interventions and strategies are described in the next section. Meanwhile, efforts continue to conduct rigorous research on HIV prevention interventions among school-aged children.

Thus far, there are no large-scale research projects in the literature that adequately address the success of HIV prevention interventions among school-aged children.

The research that does exist is largely descriptive and typically compares “high-risk” children (e.g., children of HIV + mothers, children of drug-dependent parents, children in high-seroprevalence areas) to age and gender-matched community controls (e.g., Armistead et al., 1999; Sigelman, Goldenberg, Siegel, & Dwyer, 1998). Generally speaking, young people directly affected by HIV disease tend to have slightly higher knowledge about the disease and its sequelae, but few differences in attitudes or behavior are observed. Schonfeld et al.'s (1995) study of a program for elementary school children demonstrated that knowledge levels regarding HIV/AIDS can be increased through classroom-based education, but this study did

not target or measure crucial variables known to be more predictive of behavior (e.g., attitudes towards prevention, normative support for prevention, self-efficacy for prevention or intentions to engage in preventive behavior).

*Healthy People 2020* (2012) reports goals of cumulative health education programs for elementary, middle, and senior high school children. These are commendable goals, but progress reports from *Healthy People 2010* do not bode well for accomplishing these goals. One *Healthy People 2010* progress report stated that school health education, especially HIV/AIDS prevention programs, declined in priority. Subsequently, children in grades K–12 are not receiving age-appropriate HIV/STD curricula they desperately need (Progress Toward Healthy People 2010 Targets, 2010).

One problem is the dearth of available curricula with proven effectiveness for children between the ages of 6 and 12. According to a review by Wolff and Schoeberlein (1999), those middle schools that do implement any HIV preventive education at all tend to use locally developed programs with unproven efficacy. Although the CDC maintains a list of HIV/STD prevention “Programs that Work” (Centers for Disease Control and Prevention, 2009), all listed programs are targeted to older students and thus little formal information is available for developing curricula for students under the age of 12. Preventive education efforts are further hampered by local control and local decision-making, both of which are often unsupportive of HIV prevention efforts that include frank discussions of sexual issues with young people (Wolff & Schoeberlein, 1999).

The following outline of an age-appropriate HIV/STD prevention curriculum is taken partially from Pozen (1995, pp. 249–251) and from Kirby (1999b, pp. 202–205; Kirby et al. 2007) and includes suggestions from Schonfeld (2000).

The TPB specifies that intentions to carry out a behavior are the most proximal predictor of engaging in the behavior. Intentions, in turn, may be determined by individuals’ attitudes towards the behavior, perceptions of subjective

normative support for the behavior, and perceptions of behavioral control (PBC) or self-efficacy with respect to the act in question. This model has been successfully applied to condom use in numerous studies, although it is known that for preteens, intentions are less likely to relate to behavior and normative influences are more marked (Johnson & Boynton, 2010).

*Kindergarten through third grade (ages 5–8):* In early elementary school, there are two important goals for HIV/STD preventive education. The first is to reduce anxiety related to AIDS. Numerous descriptive studies of young children’s views about HIV/AIDS suggest a high level of fear and misconception and an overestimate of both the prevalence of HIV/AIDS and the ease with which one can contract the disease (Schonfeld, 2000). Thus, children should be taught that it is not possible to contract the disease via casual contact or insect bites and that only very intimate contact between two people results in HIV transmission. The second goal of HIV/STD prevention education is to lay the groundwork for healthy patterns of behavior that are linked to later risk reduction. For example, a basic description of viruses and bacteria and how they cause disease is important. Children should understand that usually the body can fight off these organisms, and sometimes we need medicines to help, but that there is currently no medicine available that will help a body completely “kill” HIV. At this point, it is appropriate to teach children the importance of good hygiene and of not touching others’ blood or bodily fluids. An HIV prevention curriculum should include a drug abuse prevention component, and children at this age can be taught about the link between the abuse of alcohol and illicit drugs and the propensity to make bad decisions regarding one’s health. Further, they can be taught that injection drug use is one way that the virus is spread and that they should never touch discarded needles or syringes. Finally, the link between personal behavior and health should be stressed in order to increase self-efficacy. Children should be taught that it is both their right and their responsibility to be assertive in protecting their own health.

This is the goal to which TPB content can be directed. Interventions can include exercises encouraging positive attitudes towards being responsible for one's health, e.g., that it is important and that it is a good thing to do. Telling children that their parents and teachers believe it is important for them to take responsibility for their health can generate normative support. Peer group discussions of ways in which individuals can protect their health also promote a strong descriptive norm for responsibility. Finally, fostering a sense of general self-respect and self-esteem is crucial in the development of a sense of behavioral control over and self-efficacy for protecting one's health. Finally students can be asked to describe their intentions to protect their health and give specific examples of how they will accomplish this.

*Fourth and fifth grades (ages 9–10):* The goal of HIV/STD prevention in this age group is to prepare young people to make decisions with regard to their participation in sexual and alcohol/drug use activity. At this stage, it is appropriate to begin basic sex education, including anatomy and the physiology of reproduction. Some educators recommend that this introduction to sex education is most effective when boys and girls are taught separately. Once the basics of sexual intercourse are explained, children should be taught that this type of intimate sexual activity is a primary way that HIV and other sexually transmitted diseases are spread. The anxiety-reduction component can be reintroduced at this point both to reinforce earlier education and to highlight the ways in which HIV can be spread (e.g., sexual contact) versus the ways it cannot (e.g., hugging, sharing bathroom facilities).

More specific information regarding the link between alcohol and drug abuse and dangers associated with HIV transmission can be given at this age. Children should be taught not only about the transmission of HIV via certain types of drug use (e.g., sharing needles) but also that the use of such substances can impede one's decision-making abilities and make them less likely to make healthy choices. An explanation of the effects of alcohol and illicit drugs on the

body and the process of addiction may also be appropriate. Primary education on the role of viruses and bacteria in the disease process can be increased. The role of the immune system can be made more concrete, and the general effects of HIV on the immune system can be elucidated. Children can also be taught about the formation of antibodies and how HIV screening tests work via the detection of these antibodies in a person's blood. A continuing focus on assertiveness and responsibility training is also important, as these young people will soon encounter opportunities to engage in risky behaviors including alcohol and substance use.

Behavioral goals to be targeted by TPB intervention content can be more concrete at this stage, perhaps focusing on the ability to resist becoming sexually active and to resist involvement in drug and alcohol use. To encourage positive attitudes towards these behaviors, students can be told to list all the benefits of *not* being sexually active and of *not* being involved in drug use. Discussion can focus on abstinence as the most certain way of protecting oneself from HIV and STD infection. Normative support can again be generated by discussions about parents' and teachers' beliefs that it is important for young people to delay intercourse and refrain from drug and alcohol use. Perceived behavioral control can be enhanced through role plays of ways to resist peer pressure to engage in sexual activity and drug or alcohol use. Young people can then write down or discuss their intentions to delay sexual activity and avoid substance use.

*Sixth through eighth grades (ages 11–13):* At this stage, the HIV/STD preventive education should be focused heavily on equipping young people with correct and specific information regarding HIV/STD transmission and prevention, positive attitudes towards important preventive behaviors such as delaying sexual intercourse or using condoms consistently, normative support for prevention from peers and important others, and an enhancement of their belief in their ability to negotiate risky situations and engage in safer behaviors. Kirby (1999b, Kirby et al. 2007, in a review of school sexuality education programs, emphasized that successful

programs incorporated goals that were appropriate to the age of the students. In the case of 11–13-year-olds, depending on the demographic makeup of the young people, most are probably not sexually active, so an abstinence-focused program is most appropriate. However, a subset of this age group is very likely to become sexually active during this time frame (Aarons et al., 2000), so adequate information about effective condom and contraception use should also be included. Exercises to enhance attitudes towards prevention behaviors should include the generation of benefits of abstinence and the benefits of condom use if one chooses to be sexually active. Young people should be asked to discuss why they believe abstinence or condom use is important in order to enhance descriptive normative support for prevention. While parents are still crucially important as sources of normative support, in the early teenage years, the focus shifts from parents to peers, so believing one's peers think abstinence and/or condom use is important is likely to heavily influence behavior. Research with adolescents across domains of risk behavior consistently shows a strong association between perception of peer norms and levels of risk behavior (Kirby, 2002a). In the case of sexual risk behavior, perceived peer norms are strongly related to both age at first intercourse (Kirby, 2002b) and frequency of condom use (Kirby, 2001).

By the 7th and 8th grades, HIV prevention education should begin to focus more on specific information about the proper use of condoms including a condom demonstration in order to help young people begin to develop a sense of behavioral control over this activity. Young people this age are likely to be uncomfortable handling condoms themselves but should be shown how to properly apply, remove, and dispose of a condom by a teacher/facilitator. Behavioral control also involves social skills for negotiating risky situations in a number of domains. These skills should be fostered in this age group, ideally using a variety of methods including role play and rehearsal, written strategies for dealing with particular situations, and modeling by peers or facilitators of ways to

communicate with peers and romantic partners regarding risk behavior (Kirby, 1999b; Kirby et al., 2007; Schmiede, Broaddus, Levin, Levin, & Bryan, 2009). Such skill rehearsal can be focused on less sensitive areas first (e.g., a peer tries to get you to try a cigarette) and move on to more sensitive areas (e.g., a boyfriend tries to get you to have sexual intercourse) once the former are mastered. Skill rehearsal is an extremely effective method for increasing both perceived self-efficacy and actual ability for dealing with risky situations. Further, watching peers model risk reduction during role playing is likely to further increase normative support for preventive behavior. Finally, young people should again be encouraged to think about their particular behavioral goal (e.g., to remain abstinent or to use condoms consistently if they become sexually active) and how they can go about achieving it. Many programs for older adolescents use the strategy of having young people write down their behavioral goal and why they chose it in order to strengthen a sense of commitment to the goal (cf. "Reducing the Risk" by Kirby, Barth, Leland, & Fetro, 1991; Schmiede et al., 2009).

Aarons et al. (2000) reported on the effectiveness of an intervention to postpone sexual intercourse among junior high school students. The program took place in Washington, D.C., and included the use of a standard of care comparison group. Health professionals implemented the program, which included reproductive health classes, the Postponing Sexual Involvement Curriculum in the 7th-grade year, and a variety of educational activities in the 8th-grade year meant to bolster program effectiveness. There were large gender differences at baseline in terms of sexual activity; while 81 % of girls reported being virgins at baseline, only 44 % of boys were virgins. The intervention appeared to have some desired effects for girls, in that significantly more of the intervention girls remained virgins at the end of the 8th-grade follow-up year compared to the control group girls. In addition, intervention girls who reported being sexually active were significantly more likely to have used some form of birth control at last intercourse at all post-intervention measurements. The



program appeared unsuccessful with boys, as there was no difference in intervention versus control boys' rates of virginity, attitudes regarding abstinence, or the use of birth control.

Coyle, Kirby, Marin, Gomez, and Gregorich (2004) reported on the effectiveness of a preventive intervention to reduce sexual risk behaviors among middle school adolescents. This randomized controlled trial took place in northern California. Health educators implemented the program, which included three separate programs for sixth, seventh, and eighth graders. The sixth-grade curriculum focused on refusal skills in nonsexual situations. The seventh-grade curriculum concentrated on determining personal limits, the consequences of unprotected sex, and negotiation skills. The eighth-grade class had an HIV-infected speaker, had a condom demonstration, and focused on negotiation skills with a romantic partner. Unlike the Aarons et al. (2000) program, *Draw the Line/Respect* appeared to have significant results among boys, not girls. Intervention boys delayed sexual initiation, perceived fewer peer norms supporting sexual intercourse, had stronger sexual limits, and were less likely to be a part of a risky sexual situation. The program appeared unsuccessful with girls.

These studies highlight the importance of tailoring intervention content to the age, maturity, and gender of the students with whom one is intervening (cf. Jemmott & Jemmott, 2000; Pedlow & Carey, 2004). For the girls participating in the Aarons et al. (2000) intervention, the vast majority of whom were not sexually active, a focus on postponing sexual activity, while also providing adequate information about reproductive health, condom use, and contraception, seemed a successful strategy. For boys participating in the Coyle et al. (2004) program, a developmentally appropriate progression through negotiation and practical skills to avert risky sexual situations seemed a successful strategy. These findings also highlight the potential necessity of a different program focus for boys and girls of the same age. A consistent finding both in the USA and cross-culturally is that boys initiate sexual activity at a younger age than girls.

Formative research on the current sexual activity level of the population at focus becomes very important in the determination of the use of an abstinence-focused or condom use-focused intervention strategy.

### Strategies That Do Not Work

While the definitive formula for an effective program has yet to be ascertained, there is some converging evidence to suggest strategies that are unlikely to be effective. It is clear that information-only strategies, while they definitely increase knowledge related to HIV transmission and prevention, have little or no effect on actual risk behavior (Johnson et al., 2011; Kirby, 1999a). This finding is completely consistent with HIV prevention research among other populations and is now assumed by virtually all HIV prevention researchers and practitioners.

The lack of success of a second strategy may seem somewhat counterintuitive. Although many people would consider parent-child communication about sexual issues to be an important part of an overall strategy for reducing sexual risk, studies of such interventions show that "there is no reasonably simple and robust relationship between parent-adolescent communication about sexuality and delay in the onset of intercourse" (Kirby, 1999b, p. 196). The same is true of the influence of specific parent-child discussion of contraceptive use and HIV/STDs. There appears to be no clear relationship of such discussion to higher rates of health-protective behavior, and in fact some studies have shown that parents who engage in discussions of HIV and STDs have children who engage in *higher* levels of sexual risk behavior (Kirby, 1999b). The causal direction of that particular relationship is not clear, and there are serious methodological limitations involved in research on this topic. Nevertheless, both parents and adolescents believe that such discussion is important, and thus programs should endeavor to improve such communication where possible. Further, in a recent study by Blake, Simkin, Ledsky, Perkins, and Calabrese (2001), parent-child "homework"

exercises were designed to reinforce school-based sexual risk reduction curricula in a middle school. Their results suggested that the classroom curriculum enhanced with parent–child homework assignments resulted in stronger effects on self-efficacy for refusing high-risk behaviors and stronger intentions to delay intercourse than did the classroom curriculum alone. These results are encouraging, but without more reliable evidence of effectiveness, the responsibility for teaching young children HIV/STD preventive behavior should not be left to parents alone. On a more positive note, and consistent with problem behavior theory, family connectedness including warmth, closeness, good parental supervision, and boundary setting does appear to be related to the delay of sexual intercourse as well as to other health-protective behaviors.

Finally, reviews of different preventive interventions for HIV/STD conclude definitively that abstinence-only interventions – that is, those that focus explicitly on delaying intercourse (typically until marriage) and only mention condom and contraceptives in the context of their failure to completely protect against unwanted pregnancy or STDs – are wholly ineffective. The weight of the evidence is that such programs fail to delay the onset of intercourse (Johnson et al., 2011; Kirby, 2002c). Further, since they give only passive coverage to ways to make sexual behavior safer, they also fail to increase condom and contraceptive use among those who become sexually active. It has become increasingly obvious that the inclusion of *both* abstinence and safer sex content is crucial for program success. The weight of program time devoted to a focus on abstinence versus a focus on safer sexual behavior should be determined, as has been reviewed, by the age and maturity of those who are the targets of the intervention.

## Summary

The best HIV prevention program for young children between the ages of 6 and 12 years of age is one that integrates HIV prevention into an ongoing health behavior curriculum in schools.

Typically, there is not a high dropout rate in this age group, so interventions implemented in the school setting are likely to cover the broadest audience of young people. Yet, placing the burden on the shoulders of elementary educators brings up the most important barrier to the provision of HIV prevention programs (Schonfeld, 2000). Because of discomfort discussing sexual issues with children, a lack of training in human sexuality in general or HIV/STDs more specifically, and fear of reprisal from parents or administrators for explicitly answering frank questions about sex, teachers are reluctant to participate as facilitators in HIV prevention programs. Schonfeld (2000) reviews ways of helping teachers to become more comfortable addressing such sensitive topics, including in-service trainings by HIV prevention professionals. It is also important that teachers are fully supported by school administrators in their efforts and that both teachers and administrators be made aware that parents overwhelmingly support the provision of HIV/AIDS information in schools (Schonfeld, 2000).

An ideal health behavior curriculum should include an early and direct focus on individual responsibility for one's own health and on the link between personal choices about health behavior and health outcomes. Specific content with regard to drug use and sexual behavior should be included at age-appropriate intervals, and techniques to address these behaviors should be grounded in behavioral science theories (e.g., Theory of Reasoned Action/Planned Behavior and Social Cognitive Theory, used in Jemmott, Jemmott, & Fong, 1998; Protection-Motivation Theory used in Stanton et al., 1996; Social Learning Theory used in Kirby et al., 1991) with proven empirical success in HIV risk reduction with older adolescents.

As of 2010 the USA had withdrawn Federal support for ineffective abstinence-only programs and reattributed \$100 million dollars to empirically supported teenage pregnancy prevention programs (U.S. Department of Health and Human Services, 2009). The empirical evidence suggests that this money is well spent. It is absolutely crucial that for every age group HIV/AIDS

prevention programs include comprehensive information on methods of making sexual behavior safer. Finally, key to the success of interventions meant to discourage risky sexual behavior is that they be implemented *well before young people are sexually active*. It is far easier to establish healthy patterns of behavior early on than to attempt to change risky behaviors once they have been initiated.

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## Homicide During Childhood

Laura Kate Corlew

The East-West Center, Honolulu, HI, USA

### Introduction

Child homicide is a rare, though devastating, phenomenon that includes a range of violent acts. Whether perpetrated by a caretaker, stranger, or peer, child homicide upsets societal values calling for the protection of our young. Child homicide follows multiple patterns depending on the age of the child, the relationship between the perpetrator and victim, and the purpose or deliberateness of the killing. For this reason, multiple prevention efforts are recommended to address the multiple avenues leading to child homicide.

### Definition and Scope

The current child homicide rate in the United States is 2.3 deaths per 100,000, with 80 % of the victims aged four or younger (U.S. Department of Health and Human Services, Children & Youth and Families, 2010). The US rate is much higher than other Western countries (Pritchard & Butler, 2003) and is as much as five times higher than that of 25 other industrialized nations combined (Centers for Disease Control and Prevention [CDC], 1997). This rate, though low, includes multiple types of child death. Each will be addressed here.

Filicide and other intrafamilial homicide are child homicide perpetrated by a caretaker, typically a parent or other close relative. Filicide may follow multiple patterns of violence. Fatal child abuse (sometimes referred to as fatal non-accidental injury) is the most common mechanism for filicide and all child homicide (Cavanagh, Dobash, & Dobash, 2007). Fatal child abuse is often preceded by nonfatal abuse (Baralic et al., 2010; Fujiwara, Barber, Schaechter, & Hemenway, 2009). In many cases, the nonfatal abuse has been recorded by

hospitals or social services prior to the fatal child abuse event. Neglect often co-occurs with fatal child abuse but is rarely the cause of death (Connell-Carrick, 2003; Sidebotham, Baily, Belderson, & Brandon, 2011). Neonaticide is the deliberate killing of a child within 24 h of its birth (Baralic et al., 2010). Neonaticide is often associated with an unwanted or secretive pregnancy. Filicide may also be part of a murder/suicide event in which a parent or stepparent takes the life of the child and perhaps the spouse, followed by suicide (Flynn et al., 2009).

Despite media sensationalism, stranger homicide is far more rare than fatal child abuse. Stranger homicide follows two main distinct pathways. When perpetrated by adults, stranger homicide is often coupled with sexual assault of the victim. The perpetrator is most likely to be a single man with a history of violence and experienced abuse (Cavanagh, Dobash, & Dobash, 2005). Child homicide perpetrated by juvenile offenders (such as juvenile gang homicide) is similarly rare (Densley, 2011; Douglas & Bell, 2011; Rodway et al., 2011). The underdevelopment of juveniles' frontal lobes means they are more impulsive, and the homicide is more likely to be committed with a lack of clear intention, compared to adult perpetrators (Heide, Solomon, Sellers, & Chan, 2011). Stranger homicide also includes mass murders (e.g., school shootings), which are also extraordinarily rare (Levin & Madfis, 2009). Risk factors for juvenile homicide perpetration as a single-person killing or mass murder largely overlap and will be discussed together.

According to age category, the children at the highest level of risk for homicide are under age 4, especially children aged 1 and under, and newborn infants (Cavanagh et al., 2005). Recent increases in infant homicide during the past few decades are likely due to an increased sensitivity to violence against children and infants. The same time period has seen a decrease in accidental deaths reported (Riggs & Hobbs, 2011). Children age 5–14 have the lowest risk. Adolescents experience an upswing in risk, including threat from caretakers and other adults as well as from other adolescents (Adams, Bennion, Openshaw, & Bingham, 1990).



There are mixed results as to whether females or males are more likely to die from homicide in younger age groups (Adams et al., 1990; Baralic et al., 2010; Burgess & Roberts, 1996; Cavanagh et al., 2007), though males are at a much higher risk of homicide perpetration and victimization than females in the adolescent years (Adams et al., 1990). Younger children are most likely to be killed inside the family and older children are most likely to be killed outside the family (Cavanagh et al., 2005). In all age brackets, African American children are more likely to die than Caucasian children from homicide (Adams et al., 1990; Bernard, Paulozzi, & Wallace, 2007).

## Theories

There are two major intervention pathways to preventing childhood homicide. One is to utilize early intervention strategies to prevent the development of violent and aggressive tendencies, thereby reducing risk of homicide perpetration. The perpetrators of child homicide, including fatal child abuse and stranger homicide, were often subjected to multiple risk factors in their early lives. Childhood abuse, including sexual abuse, is positively correlated with later perpetration of violent crime up to and including homicide (Brewer-Smyth & Burgess, 2008; Burgess & Roberts, 1996; Cavanagh et al., 2005; Friday, 1995). Child abuse is therefore correlated with both risk of homicide and potential to commit homicide. Consistent with attachment theory, children who are abused, have a high number of placements in foster care, and have other insecure relationship attributes with their parents or caregivers, will have a higher level of risk for aggression or violence later in life (Douglas & Bell, 2011).

From a developmental perspective, violence and aggression follow two main trajectories: early-onset trajectory and late-onset trajectory (Douglas & Bell, 2011). The early-onset trajectory is typified by violence, aggression, and other behavior problems beginning in early childhood. Early-onset violent offenders tend to commit

more crimes, including crimes that are more serious, and tend to commit crimes for a longer period of their life. Early-onset offenders often follow a pattern of escalating violence. The late-onset trajectory is typified by an absence of violence until adolescence. Violent activity peaks at age 16 and typically declines by age 20. In both early-onset and late-onset trajectories, most offenders will abruptly end their violent offenses as they transition into adulthood and their frontal lobes reach full development. As of yet, there are no screening tools available to identify which juvenile violent offenders in either trajectory will continue to offend into adulthood nor which juvenile violent offenders are at the highest risk for perpetrating homicide. As Douglas and Bell (2011) note, "Risk factors are not predictive factors due to protective factors" (p. 208). Family, neighborhood, and other situational factors influence outcomes in both positive and negative ways.

The second major theoretically derived pathway for childhood homicide prevention is to intervene in contexts in which there is an immediate risk of homicide. Fatal child abuse is commonly preceded by nonfatal abuse. This abuse often takes the form of violent punitive discipline, and very often the intention of the perpetrator in the fatal child abuse event was to harm the child but not to kill the child. In a study of male perpetrators of child abuse, Cavanagh et al. (2007) found that in cases of caretaker fatal child abuse, the caretaker often had unreasonable expectations of the child's capacity to self-regulate behaviors and a low tolerance for normal childhood behaviors. These caretakers also overestimated their own child care abilities and frequently turned to violence as punishment during child care. Fatal child abuse tends to occur in immediate response to a "trigger," such as a child who will not stop crying. The perpetrator responds violently with the intention of forcibly disciplining or silencing the child. In most cases of fatal child abuse, this pattern of trigger and response has occurred before in which the child was harmed but not killed. The intention during the fatal abuse event was no different than previous abuse events.



Fatal child abuse should therefore be distinguished from stranger homicide by adults and juveniles. In many cases, stranger homicide by adults includes homicidal intention, possibly for the purpose of covering up a sexual assault (McCann, 1995; Zagar, Busch, Grove, & Hughes, 2009). Many of the incarcerated perpetrators of nonfamilial child homicide had previous sexual assault convictions, showing a pattern of behavior distinct from perpetrators of fatal child abuse (Cavanagh et al., 2005). Though patterns of violent aggression are shared, the type of violence in the pattern contains different motives and is not relational to the victim. The potential victim pool is much wider. Interventions can only focus on potential perpetrators based on previous convictions; a potential victim would be difficult at best to determine.

Juvenile homicide offenders are most likely to be male and are most likely to commit homicide impulsively during an altercation. The victims are also most likely to be males, within a peer age range. Victims are least likely to be a family member and most likely to be a stranger, followed by an acquaintance (Heide et al., 2011). Though patterns of violent or aggressive behavior may be apparent, there is rarely a pattern of violence with the victim. Interventions focused on immediate risk of homicide must therefore focus on potential perpetrators based on previous behaviors or convictions.

## Research

Because childhood homicide is so rare, exploring the effectiveness of preventions can be difficult (Douglas & Bell, 2011). Longitudinal analyses of aggregated statistics are used to show change in incidence rates over time (Adams et al., 1990). Unfortunately, archival databases on child homicides are often prone to misreporting. During active investigations, local or state databases may record child homicides as accidental deaths or accidental deaths as child homicides, or fields may be left blank. The CDC's National Violent Death Reporting System has a high accuracy rate; archival research often turns to this database or

others that are highly correlated with it (Barber & Hemenway, 2011). Archival research of this nature can show general trends in child homicide at societal (CDC, 1997; Pritchard & Butler, 2003) and regional (Lester, 1993) levels, giving a broad overview of the effectiveness of popular interventions.

More targeted studies mine archival records reporting on homicide events to analyze the number and category of deaths, demographic information of victims and perpetrators, victim relationship to perpetrator, and cause of death and injury (Baralic et al., 2010; Rodway et al., 2011). Such studies explore patterns of risk which can then be addressed in prevention efforts. Other approaches include studying perpetrators of homicide in qualitative or quantitative studies with prison inmates to search for similarities among event characteristics or perpetrator characteristics (Brewer-Smyth & Burgess, 2008; Cavanagh et al., 2007).

In community-level studies, epidemiology and other public health strategies can map community-level risk and protective factors (Douglas & Bell, 2011; Jason, 1984). Not only does this approach allow for an exploration of patterns in the homicide event to inform prevention efforts, but it further can be used to assess the real-world effectiveness of local preventions that have been put into place. A public health approach in research is particularly beneficial when tied to the evaluation of prevention efforts that are based from a hospital setting. Case studies of prevention efforts evaluate the intervention itself, the participant outcomes, and regional impacts of the prevention's implementation (Douglas & Bell, 2011; Hicks & Gaughan, 1995).

## Overview of Strategies

Explorations of the patterns and categories of child homicide have clearly shown that fatal child abuse is the most common type of child homicide. While fatal child abuse is not always associated with previous instances of nonfatal abuse (Hicks & Gaughan, 1995), it is most commonly reported as a final incident within a pattern

of violence between perpetrator and victim (Cavanagh et al., 2005, 2007; Finkelhor & Jones, 2006). Therefore, a major strategy in preventing child homicide is to address instances of child abuse. Child abuse can be addressed through primary prevention efforts to prevent any abuse from occurring or as a secondary prevention measure to prevent child abuse from recurring and potentially escalating into homicide.

Prevention efforts may focus on addressing known high-risk populations, such as children under the age of five living in low-income areas (Birken, Parkin, To, Wilkins, & Macarthur, 2009) or parents who have shown a tendency toward abusive discipline (Cavanagh et al., 2007). Poverty and other risk factors often co-occur with violence, both in terms of current risk of victimization and future risk of perpetration. Risk factors that correlate with violence, such as harsh parenting and exclusion from school, should be addressed to prevent the outcomes associated with cumulative risk (Friday, 1995; Hill-Smith, Hugo, Hughes, Fonagy, & Hartman, 2002; Rutter, 1979). To prevent perpetration of violence in both juveniles and adults, interventions should address mental health issues that often co-occur with violence. In adults, psychiatric issues such as depression and personality disorder are highly associated with homicide offenders (Falkov, 1997; Finkelhor & Jones, 2006; Reder & Duncan, 1997). Mental health issues such as ADHD and major depressive disorder are commonly linked to violent youth, including juvenile homicide offenders (Douglas & Bell, 2011). Psychopathic traits in violent or aggressive youth should also be assessed (Lindberg et al., 2009).

Substance abuse also commonly co-occurs with violent offenses, including homicide, in both juveniles and adults. Direct interventions targeting drug users and indirect interventions seeking to lower overall drug use rates in a community or region are both appropriate strategies for reducing this risk. Similarly, juvenile and adult homicide offenders often show patterns of violent or aggressive behaviors, as well as general offense arrests, prior to the homicide event. Indicated prevention measures addressing

individuals with these risk factors for homicide perpetration may be appropriate when there are children in their lives. Finally, addressing general community risk factors, such as gang activity, crime, drug use, and community disorganization, is advised. Improving support services and other protective factors in the lives of potential victims and perpetrators can reduce general levels of risk (Douglas & Bell, 2011).

## What Works

The editors of the *Encyclopedia of Primary Prevention* require that the empirical research in this section include only interventions with documented success in three or more trials. Given the relative rarity of childhood homicide and the social complexities of the identified risk factors, a search of the literature did not yield results that meet these criteria. However, a significant amount of promising research does exist in the field of child homicide prevention and will be discussed in the next section.

## What Is Promising

Effective and comprehensive child homicide prevention interventions often operate through multiple agencies working in collaboration with one another to address risk factors and protective factors at multiple ecological levels (Douglas & Bell, 2011; O'Connell, Boat, & Warner, 2009; Rodway et al., 2011). Such interventions are often catered toward general prevention of violence against children rather than specifically child homicide. Because child homicide is so rare an occurrence, many programs instead focus on preventing child abuse at individual, family, social, and community levels. With a reduction in child abuse in a community comes a reduction in abuse culminating in fatality. Such interventions include multiple "staples" associated with reducing risk factors in a family or community and promoting protective factors. This includes increasing individual and family connectedness to social supports, accessing

resources, and addressing instances of trauma. Risk factors specifically associated with homicide perpetrators include early childhood trauma, developmental failure, interpersonal failure or weak social ties, antisocial behavior, and poor executive function (Burgess & Roberts, 1996; Cavanagh et al., 2005; Douglas & Bell, 2011; Hughes, Zagar, Busch, Grove, & Arbit, 2009; Zagar et al., 2009). Interventions addressing these risk factors reduce perpetration of violence later in life, thereby having an indirect impact on child homicide.

It should be noted that interventions addressing such risk factors are beneficial to many people in addition to those at risk for becoming a victim or perpetrator of child homicide. Due to the large number of negative outcomes associated with these risk factors, preventions designed to address them can be considered “no regrets” interventions. Over time, they are likely to reduce childhood homicides in a community and/or directly prevent a child homicide in a family. However, these interventions are beneficial to society regardless and can therefore be implemented in connection with a wide variety of prevention and promotion programs.

Several interventions have been tied directly to the prevention of fatal child abuse in a family or community. One of the most successful and commonly implemented is that of the domestic violence shelter (Burgess & Roberts, 1996). Shelters and other protective services provide safety to women who are victims of domestic violence and their children, thereby reducing the immediate risk of fatal child abuse and other child homicide. These programs are particularly effective in preventing abuse and homicide, as well as promoting safety, when combined with services to increase self-sufficiency. An opening of economic and social opportunities increases the protective factors available in the long term which reduce the possibility of child homicide once the protective services are no longer utilized. In a review of preventions relating to child abuse, Burgess & Roberts also note that foster care placement is commonly used and may help prevent fatal child abuse. Unfortunately, multiple

placements in the foster care system cause instability during the child’s development, which is a risk factor that increases the likelihood that the protected child may later become a perpetrator of violence.

Parenting interventions for new parents in high-risk populations, including teen parents and parents in high-risk neighborhoods, have also shown success in preventing fatal child abuse (Cavanagh et al., 2007; Douglas & Bell, 2011). These interventions typically take the form of parenting classes in a hospital (or high school for the case of teen parents). The classes discuss new infant care, dealing with triggers for violence (babies who will not stop crying, wetting the bed, unrealistic expectations of discipline or obedience for very young children, etc.), and expectations for infant and child behavior. These classes may also focus on appropriate forms of discipline, including alternatives to “frustration punishment” that is commonly associated with fatal child abuse (Cavanagh et al., 2007). For example, one such hospital intervention showed a 47 % decrease in child head injuries associated with abusive care in the hospital region but not in adjacent regions (Fujiwara et al., 2009).

New parent intervention classes may or may not be conducted jointly with home nurse visitation programs, which are also successful in child abuse and homicide prevention (Burgess & Roberts, 1996). Nurses make periodic visits to the homes of infants or small children to assess the health of the child, family, and environment. The nurses will also offer guidance, lessons, supports, and assistance in accessing resources to the family. In addition to reducing abuse, violence, and drug use, home nurse visitation programs have been shown to increase intellectual functioning and ameliorate the negative impacts of poverty (Fujiwara et al., 2009). However, neighborhood effects such as community poverty and lack of employment opportunities may counteract the benefits accrued by home nurse visitation programs (Douglas & Bell, 2011).

Prevention efforts also take the form of preventing the escalation of violent or aggressive tendencies to reduce the risk of later homicide perpetration. In the case of gang violence and

other adolescent violence, early interventions that are most successful work within a comprehensive model to address multiple risk and protective factors, such as parental supervision, peer interactions, community connectedness, or social-emotional learning (Douglas & Bell, 2011; Friday, 1995). These interventions will include individual and systemic aspects to target youth who have shown aggressive behavior while simultaneously reducing normative violence in a community (Densley, 2011; Rodway et al., 2011). For all types of violence, early interventions may be provided through school health programs or community support systems and agencies (Friday, 1995).

Given the multiple categories of victimization within the purview of child homicide, the best comprehensive prevention approach would include multiple avenues of prevention. Especially because child homicide is so rare, effective preventions should address the patterns of behavior that often culminate in child homicide. For example, neglect is very rarely a cause of death, but it is an indicator of risk for fatal child abuse (Connell-Carrick, 2003). Interventions that address instances of child maltreatment, including abuse and neglect, can prevent the escalation of child maltreatment into child fatality. Another correlate that ought to be addressed is that of undereducation and underemployment, which are both risk factors for male homicide offenders (Cavanagh et al., 2007). Improving the quality and standard of life in communities and specifically for those who are at high risk for perpetration of violence reduces risk for violence and may in fact increase factors that protect against it.

Interventions aimed at increasing protective factors are also recommended (Douglas & Bell, 2011). Such interventions should address multiple ecological levels from high-risk individuals and families to neighborhoods and schools. Individual and community-level protective factors that reduce risk for violence perpetration include positive peer interactions, social connectedness, supportive and sufficient parental monitoring, and community involvement. Risk factors that may be addressed in associated interventions include aggressive behaviors and an intolerant

attitude to deviance. Some evidence also exists that an increase in the availability of birth control can reduce unwanted children that may become victims of homicide, especially neonaticides associated with secretive pregnancies (Finkelhor & Jones, 2006).

Various psychiatric issues are associated with violence perpetration, up to and including homicide. Connections between psychiatric services, health-care providers, and social service agencies could potentially address risk. Parents who are receiving psychiatric services should be connected to health and human services to help reduce the risk to their children and increase their social supports and access to other resources, as well as to develop collaborative communication and services between various providers who work with these individuals (Falkov, 1997; Reder & Duncan, 1997).

Policy changes may also have a positive impact on the rates of child homicide (Finkelhor & Jones, 2006). Though in many cases the weapon that was the cause of death were the perpetrator's hands, guns are also highly employed. Gun law changes over the years have been shown to reduce homicides in general, although little research has been done on their impact on fatal child abuse. There is also evidence to suggest that changes in drug laws can reduce the general levels of homicide, although again little research has been done linking policy changes specifically to child homicide.

Stranger homicide may be addressed most effectively through policy changes. Although the early interventions to prevent later violence perpetration discussed above would apply to perpetrators of stranger child homicide, there are few to no indicators that could possibly be employed to connect a potential perpetrator with a potential victim. The anti-stalking laws that have been effective in dissuading stalking behaviors that may culminate in a physical or sexual assault of adults may be adapted at the state level to fit the unique characteristics inherent in cases with child victims. For example, definitions of threat and who can make claims of stalking behavior (e.g., parent claim versus self-claim) can be adapted to protect child victims of stalking who may have

been targeted for assault (McCann, 1995). Finally, incarceration may prove to be among the most effective methods to prevent stranger homicide. A perpetrator of child sexual assault and homicide who has been imprisoned is prevented from perpetrating similar crimes with other children (Finkelhor & Jones, 2006).

### What Does Not Work

In the quest to eradicate juvenile homicide offense, a number of tactics have been employed to prevent violence and gang activity. Gang suppression is widely used and is not effective (Densley, 2011; Douglas & Bell, 2011). Gang suppression includes interventions meant to squash gang activity by assigning extreme punishment for minor offenses. For example, a juvenile caught with a weapon may be incarcerated even without actually perpetrating violence. Jail sentences for such activities do not deter others from conducting the activity, do not deter gang involvement, do not deter violence, and also do not address the demonstrated issue – how the youth obtained the weapon and why they felt compelled to carry it (Densley, 2011). In addition, incarceration in prisons and juvenile detention facilities has been demonstrated to actually *increase* gang involvement. Juvenile offense is better addressed through the multilevel interventions described above.

Another folly in child homicide prevention is to address “risk markers” that are not “risk factors” (Douglas & Bell, 2011). For example, race is highly correlated with child homicide for both victims and perpetrators. African American children are at much greater risk than their Caucasian counterparts. However, the risk does not stem from their race; it stems from risk factors that disproportionately affect African Americans in this country. Low socioeconomic status, undereducation, underemployment, and social fragmentation are risk factors that can increase the possibility of child homicide through a cumulative risk effect. Race in and of itself does not contribute to risk for or protection from child homicide. Interventions that target

populations based on risk markers may miss the true factors at play. For example, in confidential surveys, adolescents reported the same rates of committing serious violent offenses with no correlation to their race (Office of the Surgeon General, 2001). African American youths report a proportionate level of violent activity, but are arrested at an extremely disproportionate rate. That violence escalates to homicide at higher levels has to do with associated risk and protective factors rather than race itself.

### Summary

Future research in child homicide prevention will focus on the three distinct categories of child homicide perpetration: fatal child abuse, adult stranger homicide, and juvenile homicide offense. Fatal child abuse research will continue to explore patterns and similarities between perpetrators, victims, the homicide event including triggers and context, and the risk factors associated with perpetration of violence and homicide. Adult stranger homicide will explore stalking and repeat offenders of child sexual assault and child homicide. Juvenile homicide offense research will explore the pathways to violence, the triggers or altercations that lead to homicide, as well as gang and violent youth interventions that effectively prevent violent offense.

With all types of child homicide, early intervention strategies at the individual, family, and community levels can reduce risk of both homicide perpetration and homicide victimization. In addition, early intervention strategies for child homicide can cross over widely with other early intervention projects. Child homicide research will benefit from collaboration with other risk reduction and protective factor promotion interventions. The rarity of child homicide means that widespread prevention and promotion interventions with numerous potentially beneficial outcomes can have a positive impact on child homicide rates, while interventions focused on preventing child homicide can produce other beneficial outcomes as well. Aggregated studies of incidence over time can help connect child

homicide prevention with research in other social issues. Case study research of targeted interventions will also connect child homicide prevention with other positive social outcomes.

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## Injury Prevention During Childhood

Kristi Alexander and Nicole Lightman  
California School of Professional Psychology,  
Alliant International University, San Diego,  
CA, USA

### Introduction

Unintentional injuries are among the leading causes of death and disability for children between the ages of 1 and 20 years worldwide (Center for Disease Control and Prevention [CDC], 2009; World Health Organization [WHO], 2008). In the USA, Canada, and most of Europe, unintentional injuries result in more of the fatalities to children over 1 year of age than any other cause, accounting for over a third of all childhood deaths (Vincenten, 2006). Most of the fatal injuries to children around the world result from motor vehicle accidents, falls, burns, poisonings, and drownings, with low- and middle-income countries having the highest rates (Harvey, Towner, Peden, Soori, & Bartolomeos, 2009). However, child injury remains a significant problem in high-income countries, such as the USA and Canada, where unintentional injuries account for more than 40 % of child deaths (WHO, 2008).

While it is commonly believed that most injuries are preventable, the multiple factors that contribute to injury rates impede the development and implementation of effective prevention programs. Unfortunately, across the world, the prevention of injuries has been thwarted by a variety of factors, the least of which has been awareness (Peden, 2008). In addition, the perception that injuries are the result of fate or “bad luck” further impedes progress in developing and implementing effective prevention (Morrongiello & Dayler, 1996; Morrongiello & House, 2004). In 2008, WHO published a report outlining prevention efforts for the five leading causes of injury deaths: road injuries (pedestrian, passenger, or driver), drowning, poisoning, burns, and falls. This WHO report represents

one of the first efforts to illuminate the global significance of child injury and attempts to reduce the incidence of injuries.

### Definitions and Scope

Unintentional injuries are defined as unplanned events that result in physical damage to persons when energy is transferred to them or when they are deprived of essential elements (e.g., oxygen) (WHO, 2008). Consequently, injuries sustained from war or child abuse are not considered to be unintentional, although some debate has emerged around this definition (Peterson & Brown, 1994). In the USA alone, more than 12,000 children (0–19 years) die each year due to an unintentional injury, and over nine million children sustain nonfatal injuries that require emergency treatment (CDC, 2009). Males experience almost twice as many fatal unintentional injuries as females in all childhood age groups (CDC, 2009). Additionally, boys ages 1–19 are 9 % more likely to sustain nonfatal unintentional injuries than girls the same age (CDC, 2009; Currie & Hotz, 2004). The leading cause of *nonfatal* unintentional injuries is falls (50.4 %), with 2.8 million children visiting the emergency room each year as a result of a fall (CDC, 2009; LeBlanc et al., 2006).

Because of the pervasive impact of children’s unintentional injuries, prevention has become an area of increasing focus. The public health model defines prevention as the avoidance of injury or the control of injury if it occurs (Freire & Runyan, 2006). This model defines the levels of influence as primary, secondary, or tertiary. Primary prevention is focused on the prevention of new injuries, secondary prevention aims to reduce the severity of injuries, and tertiary prevention refers to the avoidance of future injury events. In addition to the level of intervention, the specific strategy employed may be defined as passive or active. Passive prevention refers to interventions that require no action from an individual to prevent injury. Historically, this type of injury prevention has been legislatively mandated and environmentally focused and has been very

effective in reducing specific types of injuries (Christoffel & Gallagher, 1999). For example, legislation requiring the packaging of medicine in child-resistant containers has been effective in reducing, although not eliminating, poisoning deaths in the USA and Sweden (Assargaard & Sjoberg, 1995; Walton, 1982). Similarly, environmental changes, such as nonflammable children's pajamas, have been effective in reducing burn injuries; however, the scope of passive prevention interventions is often limited by the complexity of the interacting factors that increase children's risk for injury (Finney et al., 1993).

In contrast to passive prevention, active prevention requires participation from others for the safety benefits to be realized. Buckling a child into a car seat, using helmets while bicycling, and supervising children swimming in a pool are all examples of active prevention. Unfortunately, because this type of prevention requires action every time for it to be effective, consistent implementation is often derailed by children and their caregivers who may decide to forgo the bike helmet or seat belt "just this one time."

The scope of the child injury problem is not limited to the serious physical and psychological consequences for the victims. Parents of children who have experienced unintentional injuries are at risk for psychological problems such as depression, anxiety, and post-traumatic stress disorder, as well as financial difficulties (Hall et al., 2006; LeBrocque, Hendrikz, & Kenardy, 2010; Meiser-Stedman, Yule, Dalgleish, Smith, & Glucksman, 2006; Osberg, Kahn, Rowe, & Brooke, 1996). Clearly, childhood injury has a major impact on children, families, and society (Harvey et al., 2009).

## Theories

Although many different theoretical models have been applied to health behaviors, few have been applied to the childhood injury prevention (Trifiletti, Gielen, Sleet, & Hopkins, 2005). One of the most frequently cited models has been the

Haddon Matrix (Freire & Runyan, 2006). The Haddon Matrix may be used to identify potential points of intervention across phases of an injury event (pre, during, and post) as well as the characteristics of the host, agent, and environment that may increase risk. Specifically, Haddon's model implies that injuries occur when there is a transfer of energy from an agent (hazard) to a host (victim). As such, Haddon and Baker (1981) identified ten countermeasures to impede this process that focus primarily on reducing contact with the agent or reducing the amount of energy an agent releases. For example, burns result when the host (a child) is exposed to an agent (space heater) in an environment (the home). According to this model, prevention may impact any one of these variables and realize a decrease in injury rates (Haddon & Baker, 1981). Indeed, designs of space heaters that interrupt power when they are knocked over would theoretically decrease injuries to children. Inherent to the model is consideration of the characteristics of the host, such as activity level, gender, and economic status, which may increase injury risk. Several researchers have argued that not only are the characteristics of the child important in developing effective prevention but that the "host's" parents or caregivers play a major role in injury prevention (Morrongiello, Klemencic, & Corbett, 2008; Tsoumakas, Dousis, Mavridi, Gremou, & Matziou, 2009).

Another social science theory that has been applied to the prevention of unintentional injuries to children has been Protection Motivation Theory (PMT, Rogers, 1975). This model states that individuals engage in preventive behaviors as a function of their beliefs about their ability to act effectively (self-efficacy), their beliefs about the efficacy of the preventive behavior (response efficacy), and the psychological and pecuniary "costs" of engaging in the preventive behavior (response cost). This model has been used to examine various parental safety behaviors such as the use of gate stairs and the storage of poisons (Beirens et al., 2008, 2010). Although these studies found that PMT constructs accounted for differences in the safety behaviors of parents, more research is needed.

## Current Research

Currently, the vast majority of research has focused on primary prevention, that is, the prevention of an injury event, with specific attention to the development and evaluation of behaviorally based interventions (Gielen & Sleet, 2003). This focus may be attributed, in part, to a perception that environmental and legislative changes may have been “exhausted” or limited in their scope and/or ultimately require human participation (e.g., batteries in smoke detectors must be changed) (Gielen & Sleet). Within the last decade, caregiver supervision practices have become a major foci of investigation, based on research suggesting that around 90 % of injuries to young children occur while they are being supervised (Morrongiello, 2005; National Safety Council, 2005).

In addition to the interest in primary prevention efforts, research has shifted from a focus on “single independent risk factors that predict injury” (Schwebel & Barton, 2005, p. 553), such as gender, temperament, and parental characteristics, to investigations of the simultaneous contributions of the child, the environment, and the caregiver that increase injury risk. Research examining these interactive factors has found significant relationships between parent and child characteristics. For example, Morrongiello and Hogg (2004) found a tendency for parents of girls to attribute their daughters’ injuries to child behavior, while the parents of boys believe that their injured sons were “unlucky.” Similarly, child risk taking appears to be significantly influenced by the proximity of the supervising parent (Morrongiello & House, 2004). It is strongly believed that more research on the interaction of the various risk factors will provide critical information necessary to reduce childhood unintentional injuries (Gielen & Sleet, 2006; Morrongiello & Schwebel, 2008; Schwebel & Barton, 2005).

## Overview of Strategies

Many strategies to prevent unintentional injuries in children have been implemented throughout

history. Most, but not all, of these interventions have been focused on changing the behavior of children or parents with varying degrees of success (Ameratunga & Peden, 2009; Gaines & Schwebel, 2009; Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007; Kendrick, Barlow, Hampshire, Stewart-Brown, & Polnay, 2008; Koulouglioti, Cole, & Kitzman, 2008; LeBlanc et al., 2006; Marshall et al., 2005; Morrongiello, Corbett, Lasenby, Johnston, & McCourt, 2006; Munro, van Niekerk, & Seedat, 2005; Ricketts, Shanteau, McSpadden, & Fernandez-Medina, 2010; Tsoumakas et al., 2009). Currently, research suggests that the most effective prevention strategies include environmental manipulation, parental interventions, legislative interventions, and community-based interventions (Ameratunga & Peden, 2009; Gaines & Schwebel, 2009; Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007; Gulotta & Finney, 2000; Kendrick et al., 2008; Koulouglioti et al., 2008; LeBlanc et al., 2006; Marshall et al., 2005; Morrongiello et al., 2006, 2008; Munro et al., 2005; Schwebel, 2004; Simpson, Turnbull, Ardagh, & Rischardson, 2010; Towner & Dowswell, 2002). Each of these areas has been further deconstructed to explore the components of effective prevention.

Specifically, it has been found that environmental manipulations, such as replacing asphalt below playground equipment with cushioned materials and limiting children’s access to poisons and medications through childproofing, have been effective in preventing unintentional injuries in children (Ameratunga & Peden, 2009; Gaines & Schwebel, 2009; Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007; Kendrick et al., 2008; LeBlanc et al., 2006; Marshall et al., 2005; Munro et al., 2005). Further, parental interventions that increase supervision and teaching are effective in decreasing childhood injury rates (Morrongiello et al., 2008; Schwebel, 2004; Simpson et al., 2010). In addition, there have been many legislative interventions, such as mandatory child safety seats and bicycle helmet laws, which have assisted in preventing unintentional injuries in

(Ameratunga & Peden, 2009; Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007). Finally, community-based interventions have been effective in reducing the risk for sustaining an unintentional injury through socioecological measures aimed at making the community a safer place (Ameratunga & Peden, 2009; Gulotta & Finney, 2000; Kendrick et al., 2008; Munro et al., 2005; Towner & Dowswell, 2002).

Moreover, several promising interventions are currently being implemented as well as ineffective strategies to prevent unintentional injuries in children. The promising interventions to prevent children's injuries that are currently being used include childcare regulations, and safety training for parents via classes, parenting magazines, and pediatricians (Currie & Hotz, 2004; Gaines & Schwebel, 2009; Ricketts et al., 2010). In contrast, ineffective strategies for preventing unintentional injuries in children, such as environmental changes that ignore individual differences and having knowledge, but not acting on it, have been implemented (Gaines & Schwebel, 2009; Rowe & Maughan, 2009; Schwebel, 2004; Schwebel & Bounds, 2003; Schwebel & Plumert, 1999; Simpson et al., 2010; Tsoumakas et al., 2009; Watson et al., 2004). Unfortunately, despite being unsuccessful in reducing children's injury rates, such programs may be costly and utilize valuable resources that may be put to better use.

## What Works

### Environmental Manipulation

**Child Proofing and Protective Devices.** Infants and children are unable to control their own environments to be safe. Thus, adults need to take preventive action. Interventions that employ child proofing, or protective devices, to reduce the number of hazards easily accessible to children are effective in reducing the number of unintentional injuries in children (Ameratunga & Peden, 2009; Gaines & Schwebel, 2009; Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007; LeBlanc et al., 2006;

Marshall et al., 2005; Munro et al., 2005). Most of these interventions are "passive" and once implemented need no further activity to realize the protective benefits. Further, most necessitate only minimal changes to the environment such as requiring handrails on all stairways, securing heavy furniture to the wall that could fall on the child, and requiring window bars in high-rise apartments (Ameratunga & Peden, 2009; Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007; LeBlanc et al., 2006; Marshall et al., 2005). Unfortunately, children's environments contain many different hazards for which specific preventive interventions must be made in order to increase child safety.

With regard to pediatric burns, there are several effective childproofing and protective devices that help reduce these specific types of injuries to children. Both active interventions, like removing matches or lighters within child's reach, and passive approaches such as installing functioning smoke detectors and having fire extinguishers in the home have been shown to be effective in reducing fire-related injuries (Ameratunga & Peden, 2009; Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007; LeBlanc et al., 2006; Marshall et al., 2005; Munro et al., 2005). Similarly, effective preventive measures have also been developed to help reduce unintentional injuries in children related to poisoning. These preventive measures included minor manipulations in the environment such as child-resistant lids on medications and household supplies and storage of hazardous substances, so they are difficult for children to see and access (Ameratunga & Peden, 2009; Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007). In addition, environmental interventions aimed to promote firearm safety have been a recent phenomenon. By storing unloaded firearms away from where children live and play and, when storing firearms in the home, separating the storage of guns and ammunition, firearm-related unintentional injuries in children may be prevented (Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007). Similarly, unintentional drowning may be decreased

through effective interventions such as building fences around swimming pools, removing or covering water hazards, and using personal flotation devices (Ameratunga & Peden, 2009; Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007).

#### **Multifaceted In-Home Interventions.**

Multifaceted in-home interventions have been shown to be effective in reducing unintentional child injury rates. According to Kendrick and his colleagues (2008), families that received multifaceted interventions implement more safety practices and have safer home environments with fewer hazards present. Examples of such programs include Project 12-Ways and Project SafeCare (Gershater-Molko, Lutzker, & Wesch, 2003).

#### **Parental Interventions**

**Supervision.** Parental and caregiver supervision have been implicated as an important factor in children's injury risk (Morrongiello, 2005). In most cases, children do not have sufficient knowledge to understand the hazards in their environment and, consequently, cannot always act in ways to protect themselves (Munro et al., 2005). However, children are not the only ones who have difficulty accurately assessing the hazards present in their environment. In most cases, parents do not adequately anticipate risk for injuries in their children, and even when parents were aware of the potential for injury, they often do not intervene because they perceive moderately severe injuries to be a "normal" part of childhood (Simpson et al., 2010).

Several characteristics of the child appear to affect the level of supervision that he or she receives. For instance, a child's gender, age, and temperamental attributes all influence adult's supervision behaviors (Morrongiello et al., 2008; Munro et al., 2005; Schwebel, 2004; Simpson et al., 2010). In terms of gender, it has been found that girls tend to be monitored more closely than boys despite the higher rates of medically attended injuries for male children and adolescents (Morrongiello et al., 2008). In addition, the child's age in consort with the parent's expectations about what a child can do at that age

play a role in the level of supervision the child receives. Parents who hold developmentally unrealistic expectation of their child's abilities leave their child in situations where he/she is particularly vulnerable to risk for injury (Simpson et al., 2010). For example, Simpson and his colleagues (2010) found 24- to 47-month-old children who were left unsupervised sustained more injuries. Lastly, in terms of temperamental attributes, when parents supervise temperamentally difficult children closely, they sustain fewer unintentional injuries (Morrongiello et al., 2008; Schwebel, 2004).

In summary, proximity of supervision, realistic expectations of children's developmental level and abilities to identify hazards, and being aware of their children's attributes all assist parents in implementing interventions to decrease unintentional injuries (Morrongiello et al., 2008; Munro et al., 2005; Simpson et al., 2010). Because there is no universal definition of adequate supervision, consideration of individual child characteristics (and their interactions) should help determine the level of supervision that is necessary for each child in order to prevent unintentional injury (Morrongiello et al., 2008).

**Teaching and Parenting Style.** Parents can also decrease the risk of their children sustaining unintentional injuries through their parenting styles (authoritative versus permissive) and teaching the child to act in a safer manner. According to Morrongiello and her colleagues (2006), an authoritative parenting style is better at promoting the development of instrumental competence in a child than is a permissive approach. Since permissive parents are high in responsiveness and low in control, they are more likely to explain safety concerns to children, but are less likely to develop and enforce rules regarding safety (Morrongiello et al., 2006). Further, permissive parents leave more decisions up to their children and are less likely to closely supervise than are authoritative parents (Morrongiello et al.). This approach to parenting results in children having higher levels of medically attended injuries due to their lack of knowledge about how to behave safely and as to what



constitutes appropriate behavior when faced with a risky situation (Morrongiello et al.).

In contrast, authoritative parents are highly responsive and controlling; they both explain and enforce safety rules (Morrongiello et al., 2006). Consequently, authoritative parents are more likely to supervise their children, and their children are more likely to understand acceptable behaviors in different environments (Morrongiello et al.). Thus, both supervision and the ways in which a parent teaches their child about safety and how to attain it are directly related to parenting style and have implications for the child's risk of unintentional injuries (Morrongiello et al.).

**Sleep.** Children's sleep has recently emerged as an important risk factor for unintentional injuries in children. Higher rates of medically attended injuries have been found in children who do not get enough sleep (Koulouglioti et al., 2008). Therefore, interventions that highlight the importance of children's sleep hygiene to parents target and reduce a common risk factor to unintentional injuries in children (Koulouglioti et al.).

### Legislative Interventions

Legislation has been able to help prevent unintentional injuries in children in some passive ways. Implementing and enforcing laws about minimum drinking age, blood alcohol limits in drivers, bicycle helmets, car seats and seat belts, speed reduction in school zones and residential areas and designing roads for safety have assisted in reducing the number of unintentional injuries children sustain (Ameratunga & Peden, 2009; Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007). Further, a reduction in unintentional injuries related to burns has been achieved by implementing laws requiring functioning smoke detectors and requiring maximum thermostat settings for the temperature for tap water (Ameratunga & Peden, 2009; Gardner & The Committee on Injury, Violence, and Poison Prevention, 2007). However, legislation that affects childcare or businesses and protect children from unintentional injuries can be difficult to pass and implement properly.

### Community-Based Interventions

Injury prevention has a long history of effectively employing community-based interventions to reduce injuries (Gielen & Sleet, 2003). The important aspects of community-based interventions are that they are long term, multiagency collaborations, successful and focused in their leadership, surveillance based, and tailored to the needs of the community (Towner & Dowswell, 2002). For example, community-level interventions such as reducing the littering of hazardous materials, enforcing driving laws, and providing safe playgrounds have helped reduce the rate of unintentional injuries children sustain (Ameratunga & Peden, 2009; Munro et al., 2005).

Other interventions at the community level focusing on reducing unintentional injuries in children have been based on a socioecological model. This model emphasizes the importance of the system's social, behavioral, and psychological factors on maternal and child health. Application of this model includes home visits by nurses to address factors influencing maternal and child outcomes, targeting families at greater risk for health problems due to poverty, age, and lack of personal and social resources (Gulotta & Finney, 2000; Towner & Dowswell, 2002). Home visits may offer mothers vital, developmentally appropriate information about their children as well as the opportunity to learn home safety skills and techniques for providing positive attention for proper safety behaviors exhibited by their children (Gulotta & Finney, 2000). Consequently, home visits based on providing parents with additional knowledge and skills may further assist with preventing unintentional injuries in children (Gulotta & Finney; Kendrick et al., 2008; Towner & Dowswell, 2002).

### What Is Promising

#### Childcare Regulations

Mixed results have been found regarding the relationship between childcare regulations and unintentional injuries in young children. Currie and Hotz (2004) found that regulations, such as

those regarding staff to child ratios and minimum education for day-care directors, were associated with lower unintentional injury rates. However, these regulations appear to differentially exclude certain groups of children which inadvertently increase their risk for injury because they receive childcare in less-regulated settings (e.g., informal home day care). Therefore, the resultant exclusion of particular groups of children appears to cancel out the positives of creating regulations in childcare agencies (Currie & Hotz).

Despite this edging out, some childcare regulations, such as increasing the education level of all childcare workers by 2 years, may assist in decreasing the rate of unintentional injuries in children (Currie & Hotz, 2004). The cost of increasing the education level of childcare workers would be minimal in comparison to the billions of dollars spent on childhood unintentional injuries each year (Currie & Hotz). Therefore, further research is needed to determine if there is a way to implement these regulations, reduce unintentional injuries, and cut costs, without decreasing access to high-quality care for all children.

### Parenting Classes and Magazines

Parenting classes and magazines appear to be promising interventions for unintentional injuries in children. Parents with more education and training are able to recognize more hazards in their children's environment than those without education and training (Gaines & Schwebel, 2009). Although critical, simple recognition is not enough to prevent unintentional injuries in children; parents need to also teach their children how to identify danger and how to act when this danger is present (Gaines & Schwebel). Currently, parents receive information about injury prevention from their child's pediatrician (Tsoumakas et al., 2009; Vincenten, Sector, Rogmans, & Bouter, 2005). Given the limited time and competing demands present during a well-child visit, increasing parent knowledge through magazines and classes on child development and hazard reduction may significantly reduce the unintentional injury rate (Gaines & Schwebel, 2009; Tsoumakas et al., 2009). However, even with these parenting magazines and classes, parents still have a tendency to

not recognize, or explain to their children, many of the hazards in their homes (Gaines & Schwebel, 2009).

### Telling Stories

Telling stories appears to be a very promising intervention for unintentional injuries in children that is currently under researched. Ricketts and his colleagues (2010) conducted a study to examine the impact of stories on childhood unintentional injuries. They found that stories appear to be effective in preventing injury as long as they are brief and about people who have been injured in the past (Ricketts et al., 2010). However, they were only able to impact behavioral aspects of the child, not psychological ones, which may lessen the degree of impact these stories had on reducing unintentional injuries (Ricketts et al.). Further, despite the contributions made by Ricketts and his colleagues (2010), there is no evidence that these stories are any better than just any normal communication about injury risk. More research is needed to determine if this promising intervention is worthwhile to pursue.

### What Does Not Work

#### Environmental Changes That Ignore Individual and Developmental Differences

Although environmental interventions have historically been effective in reducing injuries, consideration of temperamental and developmental differences has not been included (Schwebel, 2004). Individual interventions may better protect children when they account for temperamental differences and rely on educating and training the individual to act in safe manners to prevent injuries (Schwebel). In order to prevent unintentional injuries in children, parents need to recognize their child's vulnerability to the hazards in their environments. Gaines and Schwebel (2009) found that parents identified more hazards for children in general, than for their own children, because parents tend to see their children as invulnerable. Therefore, in order to prevent unintentional injuries, parents need to take

actions to safeguard their homes as well as be proactive in the development and behavior management of their children (Gaines & Schwebel; Schwebel, 2004).

Further, developmental aspects of the child play a role. It is important to ensure that parents, as well as the child themselves, are not overestimating the child's physical abilities (Schwebel & Bounds, 2003; Schwebel & Plumert, 1999). When overestimations of physical abilities occur, children are more likely to enter situations that place them at greater risk for injury (Schwebel & Bounds, 2003; Schwebel & Plumert, 1999). Underestimating abilities may result in the child being social isolated or delayed in their physical development (Schwebel & Bounds, 2003; Schwebel & Plumert, 1999). As a result, injury prevention interventions that just focus on the implementation of environmental changes and ignore individual differences, particularly in terms of accuracy of estimate of abilities, are ineffective in preventing injuries and may even lead to an increase in negative outcomes (Schwebel & Bounds, 2003; Schwebel & Plumert, 1999). Overall, being aware of different developmental and individual aspects of their children would help parents better tailor their approaches to preventing unintentional injuries in children (Gaines & Schwebel, 2009; Rowe & Maughan, 2009; Schwebel, 2004; Schwebel & Bounds, 2003; Schwebel & Plumert, 1999).

### Knowledge Without Action

A major reason why interventions to prevent unintentional injuries from occurring have been ineffective is that even when parents know about the preventive measures, 64.8 % of them do not implement the measures in their homes (Tsoumakas et al., 2009). This lack of implementation occurs despite the fact that when parents adhere to these preventive measures, the rate of unintentional injuries in children decreases by 36 % (Tsoumakas et al.). According to Watson and his colleagues (2004), even when families were provided with consultation, education, and free safety equipment, the rates of medically attended unintentional injuries for children did not decrease. This could be due to the fact that in

most cases parents did not adequately anticipate risk for injuries in their children and thus did not implement most of protective measures available to them (Simpson et al., 2010; Watson et al., 2004). Thus, providing people with safety equipment and knowledge is not enough. Without a greater level of compliance in the implementation of the protective measures, unintentional injuries cannot be reduced (Simpson et al., 2010; Tsoumakas et al., 2009; Watson et al., 2004).

### Summary

The prevention of unintentional injuries to children is a very difficult task that requires the integrated work of children, parents, the community, and legislators. The changing world, with increasing reliance on motor vehicles and urbanization, has increased risk for children (Harvey et al., 2009). Passive prevention techniques such as non-flammable pajamas and child-resistant medication packaging have been very effective in reducing specific types of injuries, but their scope is limited (Christoffel & Gallagher, 1999). However, because many hazards are not amenable to passive prevention efforts, developmentally and temperamentally appropriate supervision is needed to ensure children's safety. Allowing children unfettered access to hazards, such as a swimming pool or hot stove, "just for a minute" because the parent "knows" how her child will behave has resulted in countless tragedies for many families.

Recent research on supervision has found that not all children who are unsupervised are injured, highlighting the role that individual differences play in determining risk (Morrongiello et al., 2008). However, characteristics of the environment increase child risk also and increase the demands on parents to provide appropriate supervision. Future research is needed to determine the role of supervision in keeping children safe across a variety of settings (WHO, 2008).

In addition to supervision, other effective interventions are known, yet limited in their dissemination. While high-income countries have legislated changes in products and laws to increase child safety, these practices have not

been implemented in low- and middle-income countries. Clearly, more research, more coordinated, multiagency efforts, and more funding are needed to provide all children with safe environments and lives free from the distress and disability of unintentional injuries.

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## Promotion of Intellectual Growth

Thomas J. Kehle<sup>1</sup>, Melissa A. Bray<sup>2</sup> and Sandra M. Chafouleas<sup>2</sup>

<sup>1</sup>University of Connecticut, Storrs, CT, USA

<sup>2</sup>Department of Educational Psychology, University of Connecticut, Storrs, CT, USA

### Introduction

This entry provides information to the degree intellectual growth can be promoted. Emphasis is placed on the significance of general cognitive ability ( $g$ ) with regard to predicting academic and social outcomes, and consideration of strategies designed to enhance cognitive functioning. The concept of intelligence and cognitive functioning has a long history including various theories to explain it, methods of assessment, debate over improving it, and associations with a myriad of outcomes. It is a difficult variable to ignore and has intrigued many over the years. Furthermore, it is clear that there is a real advantage to being intelligent – there exists no threshold where being more intelligent does not translate into measureable advantage. “For example, children who scored in the 99.9th percentile on the math section of the SAT by age 13 were found to be *18 times* more likely to go on to earn a PhD in a Science, Technology, Engineering, and Mathematics (STEM) discipline than children who “only” scored in the 99.1th percentile” (Hambrick & Meinz, 2011, p. 276).

The areas that are related to intelligence are vast including academic achievement, occupational performance, and physical (Lubinski, 2009) and mental health (Gale, Hatch, Batty, & Deary, 2009). There are strategies and interventions that can be employed that may promote intellectual functioning. There are many in the academic realm, such as story mapping to enhance reading comprehension, to folic acid for young brain development. Therefore, in summary it is not wise to view intelligence as an area to be avoided; the promotion of a well-educated and healthy person is certainly attainable by all.

### Definitions and Theories

Intelligence has been defined differently by several major theorists. In concert with Brody (1992), Kehle and Bray (2004) defined  $g$  as the first principle component in a factor analysis of a large and varied set of mental tasks. The content of any cognitive task is irrelevant. It is the degree that the task requires the individual to grapple with complexity, or the “degree the task is  $g$ -loaded, that affords its predictive utility” (Kehle & Bray, 2011, p. 63). “The great preponderance of the prediction that is possible from any set of cognitive tests is attributable to the general ability that they share...“empirical  $g$ ” is not merely an interesting psychometric phenomenon, but lies at the heart of the prediction of real-life performances” (Thorndike, 1994). Lubinski (2004, p. 100) stated, “ $g$ ” is clearly the most important dimension of individual differences uncovered in the study of cognitive abilities to date. Further, it is “among the most important individual differences dimension for structuring the determinants of Freud’s two-component characterization of life, *lieben* and *arbeiten*, working and living” (p. 100).

Consequently, as Gottfredson (2003) noted,  $g$  defines everyday life as an intelligence test. She credited Gordon (1977) for showing how daily life “mimics rather than departs from the properties of a reliable, valid test of intelligence...” (p. 294). The ability to grapple with complexity or  $g$  influences all aspects of one’s life and provides understanding of “how individual differences in  $g$  shape our individual fates (Gottfredson, 2003, p. 294).” She concluded, “life as a mental test containing subtests with a wide range of  $g$  loadings (p. 294).” Therefore, living requires a continuous series of decisions that require some degree of  $g$  (Kehle & Bray, 2011).

In contrast to  $g$ -oriented definitions, others such as Gardner (1983) have posited the existence of multiple intelligences that are not amenable to traditional indices of intellectual assessment. He suggested that intelligence is comprised of eight competencies that include *linguistic, musical, logical mathematical, spatial,*



*bodily kinesthetic, intrapersonal, interpersonal, and naturalist* (Sattler, 2008). These eight competencies are assessed using observational techniques and a questionnaire (MIDAS) developed by Gardner (1983).

Sternberg (2005) proposed a triarchic theory of intelligence that connotes intelligence as a combination of componential, experiential, and contextual dimensions. These dimensions allow the individual to adapt to the environment and to accomplish one's goals. Similar to Gardner, these dimensions are typically not measured in a traditional manner.

There are a myriad of definitions and theories of intelligence including cultural differences. For example, most Western cultures focus on problem-solving, logical, and reasoning components of intelligence. In contrast, Eastern cultures tend to view intelligence as holistic, social, and complex linguistic (Sattler, 2008). Nevertheless, according to Gardner (2011), most theories of intelligence can be grouped into four major types based on their theoretical bases: psychometric, cognitive, cognitive-contextual, and biological.

The psychometric theory is based on cognitive test performance and focuses on the structure of intelligence based on performance scores. The notion of Spearman's (1904) *g* was derived from the study of intercorrelations of tasks that comprised the psychometric test. Cognitive-based theories focus on simple to complex mental processing. Included in this grouping are sensory testing, inspection time, reaction time, working memory, and processing speed. Cognitive-contextual theories explain the influence or interaction between cognitive function and the context of the environment. Sternberg's (2005) triarchic theory, Gardner's multiple intelligences, and Piaget's stage theory are examples of the cognitive-contextual theories (Gardner, 2011).

There have been recent attempts to examine the biological foundation of intellectual functioning. Examining brain size, EEG wave length, and glucose metabolism are some examples of biologically based correlates of intelligence. To date, there is preliminary empirical evidence isolating brain function or brain physiology related to intelligence (Gardner, 2011). According to

Neubauer and Fink (2009), at the neural level, highly intelligent individuals are substantially more capable in problem-solving and employ less cortical activity than those who are not highly intelligent.

## Current Research

The most novel and current research in the area of intelligence relates to the biological and physiological aspects such as heterosis and epigenetics, nutrition including breastfeeding, and educational practices. Heterosis is defined as hybrid vigor or the result when mating occurs between two distinctly different genetic lines (Mingroni, 2004). Heterosis may account for the Flynn effect (1999) which is defined as the substantial rise (about 3.6 IQ points every 10 years) in the average IQ scores over the last 100 years. Epigenetics refers to the genetic transmission of traits over generations that is not based solely on DNA but also on environmental conditions.

Therefore, the question is what environments produce the most favorable outcomes in human behavior? For instance, the observation that monozygotic twins where one twin has autism and the other does not supports epigenetics or the occurrence of a genetic/environment interaction leading to this outcome. Other new areas of interest relative to intelligence are related to brain anatomy and physiology. For example, neurons appear to fire faster in those with higher measured IQs (Neubauer & Fink, 2009). In consideration of heterosis and particularly epigenetics, the areas of biology, physiology, and genetics and how they interact with the environment will undoubtedly change the future of how we view intellectual growth. With the major question being then, can anything be done to intercede and change the trajectory of intellectual growth in these scientific areas?

## Overview of Strategies

The strategies that promote intellectual functioning that will be subsequently reviewed are based on the recent research findings that intelligence is

influenced by not only transmission of generational genes but also environmental variables. It is expected that this interaction of genetics with environment will usher in new research paradigms to investigate environmental “triggers” that eventually alter cognitive functioning. Nonetheless, existing promising treatments will be reviewed. The promotion of intellectual functioning may occur with such things as proper nutrition, favorable environments, and efficacious treatments. It just may be that genetics and environmental factors interact to alter intelligence.

### IQs Are Rising

The secular rise of IQ scores in both industrial and developing countries has been documented. The rise in scores has been evident for over 80 years and is noted primarily on indices of problem-solving and nonverbal reasoning (Wai & Putallaz, 2011). To quote Flynn (1999, p. 6), “it is as if some unseen hand is propelling scores upward.” Amazingly, the gain in IQ scores is approximately 3.3–3.6 points per decade and the rise is at a monotonic rate. However, it was unclear whether or not this rise in IQ scores was evident in the top 5 % of the population. However, in a study conducted by Wai and Putallaz (2011), it was found the Flynn effect was both evident and similar in both male and females in the top 5 % of the distribution and at the same rate as the general population. Their results “provided evidence for the first time that the *entire curve* is likely increasing at a constant rate” (Wai & Putallaz, p. 1).

Why IQ scores are rising is not known. Theoretical explanations proposed for the effect have been varied. They include nutritional, educational, economical, social, test-taking skills, more sophisticated television and video games, and genetic explanations such as heterosis and epigenetics (Kehle & Bray, 2011; Rodgers & Wänstrom, 2007; Wai & Putallaz, 2011). However, given that there exists no relationship between adopting parents and the IQ scores of unrelated adopted children would suggest educational, environmental, and economical

explanations are not plausible (Lynn, 2007). It has been argued by several researchers, including Jensen (1998), that investigators should adopt a “multiplicity hypothesis” where each of the different proposed explanations “is involved to some (as yet undetermined) degree in producing the secular rise in scores” (p. 323).

However, Kehle and Bray (2011) have suggested a genetic explanation based on the observation that other human traits have also increased in incidence rates and appear to mimic the secular rise in IQ. According to Mingroni (2004, p. 68) “it is actually difficult to find a heritable human trait that has not undergone large secular change in recent history including height, growth rate, myopia, asthma, autism, attention deficit hyperactivity disorder, head circumference, and brain size.” Kehle, Bray, Theodore, Zhou, and McCoach (2004) have also argued that there has been an increase in rates of depression, anxiety, mood disorders, and aggression.

The increase of phenotypic changes appears to be in concert with Mingroni’s (2004) notion that the Flynn effect is the result of heterosis: “The condition that most probably causes heterosis to occur is the existence of microdifferentiation, or small-scale genetic heterogeneity between groups, that shifts to panmixia, or random mating throughout the larger population” (Mingroni, p. 864). Heterosis, or hybrid vigor, is the product of individuals from different ancestral lines mating, which tends to enhance dominant polygenetic traits (Kehle & Bray, 2011) – the opposite of inbreeding depression (Kehle & Bray). “Mingroni’s prediction that children who are more heterozygous than their parents should evidence higher intergenerational IQs, and children who are less heterozygous than their parents should evidence a mean intergenerational decline in IQ, and supposedly other heritable traits with recessive alleles” (Kehle et al., 2004, p. 864). In other words, hybrid vigor results in intergenerational increases in IQ, and inbreeding depression decreases it (Nisbett et al., 2012).

However, Nisbett et al. (2012) dismissed Mingroni’s (2004) argument that the secular rise in IQ was due to heterosis, or hybrid vigor. They employed the argument that hybrid vigor did not

appear significant by stating, “that a trend from substantial isolation to little isolation lies behind IQ gains seems implausible” (p. 140). In contrast, they believe that the Industrial Revolution was the ultimate reason for the secular rise in IQ.

Wai and Putallaz (2011) stated that after a decade, they still are in a similar state of mind as Rodgers (1998, p. 339) who said, “Having read all of the literature I can find pertaining to the Flynn effect, I am still not sure what it really is.” Nevertheless, they further stated, “Our findings lead us to suggest that the environment may have a role to play in the rise of scores among those in the right tail, in particular early education and cognitive stimulation” (Wai & Putallaz, 2011, p. 10).

Another intriguing theory to explain the secular rise in IQ is epigenetics. According to Champagne (2009), environmental factors that influenced one’s grandparents can permanently alter physiology and behavior in subsequent generations. Champagne and Mashoodh (2009) stated that “it is becoming increasingly clear that creating a division between genes and environment limits our understanding of the complex biological processes through which individual differences are achieved” (p. 127). Champagne and Mashoodh believe that epigenetic mechanisms can influence “the activity of the genome in response to environmental cues and demonstrate the plasticity that is possible through shifts in DNA methylation” (p. 129). “Therefore, the transmission of traits across generations is not limited in scope to the inheritance of DNA” (Champagne & Mashoodh, p. 130). Environmental variables, as well as the educational processes, increase the probability that genetically based predispositions will occur (Kehle & Bray, 2011).

Finally, high levels of cortisol may cause socially deviant and psychopathological behaviors and various physical health problems. Children living in poverty have relatively higher cortisol levels than those from middle-class homes (Chen, Cohen, & Miller, 2009). If children perceive their environment as threatening, stress and concomitant alteration of gene expression may be realized (Kim-Cohen & Gold, 2009).

Nonetheless, relative to educational practices, and according to Nisbett et al. (2012),

interventions such as an extended school day, small class size, and interactive academic computer software function to promote academic achievement; therefore, we can assume, according to Jensen (1969), that cognitive ability also was enhanced. Similarly, Neisser et al. (1996) reported that instruction designed to improve reasoning skills also tends to promote intellectual functioning.

With respect to nutrition, there exist several practices that should be considered. Although there is ambiguity in studies examining the efficacy of breastfeeding relative to increasing intelligence, it has been recommended that new mothers should breastfeed their infants (Nisbett et al., 2012), where feeding on demand appears to be more efficacious in promoting intelligence. As the individual grows, nutrition continues to be important in brain development and associated intellectual functioning.

The schooling process can further support cognitive development by employing empirically based treatments to promote academic functioning. In other words, schooling may help children reach their fullest potential. Nisbett et al. (2012) reviewed aspects of education that may be related to promoting intelligence. These included instruction in logical reasoning, higher-order mathematical thinking skills, and the inclusion of working memory in primary grades curricula. With respect to working memory, Nisbett et al. suggested that mnemonic strategies, and pharmaceuticals such as Ritalin, Aricept, and Modafinil, may improve working memory.

Finally, in the academic areas including reading, writing, mathematics, and spelling, there are empirically validated treatments that can increase achievement. In particular, reading comprehension, highly related to *g*, can be improved with strategies such as story mapping, story grammar, and passage retell. These techniques facilitate reading comprehension so that the individual can comprehend written material up to their *g* level.

## What Works

At the present time, no intervention meets the standard of three successful trials.

## What Is Promising

The most exciting prospect of cognitive ability appears to be based on the interaction of genetics and environment. The study of epigenetics will increase our understanding of how genetics and environment interact (Mehler, 2007), and because it is feasible now to assume that genes interact differently with different environments (Ogren & Lombroso, 2008), the design of environments that promote cognitive functioning becomes more promising. Wai and Putallaz (2011) stated that future studies should examine what has caused gains in IQ among the upper 5 % of the distribution in that it may aid in improvements in education, “maybe even intelligence” (p. 10).

Nisbett et al. (2012) suggested that there exists an interaction between genetics and environment that results in the heritability of IQ being attenuated in lower-class children. Further, if this is the case, the children who are impoverished would not develop their full intellectual potential, and therefore interventions designed to promote intellectual growth should have substantial effects.

An interesting and apparently contradictory observation is that South Korean and Finish children are the highest achieving students in the developed world. However, they have diametrically opposed methods of instruction. The South Korean system is lockstep, involves long hours of study, longer school days, and more of them in comparison to the United States educational system. It is a highly prescribed curriculum that requires considerable student commitment and near total allocation of their time to studying.

The Finish system is quite the opposite. Although they have a national curriculum, teachers have considerable freedom to teach what they want. The students have considerable freedom to learn what they want. Their study and class involvement is relaxed and informal. There is little, if any, after school assignments, the school day and academic year, is considerably less than the South Korean. Finish children spend the fewest number hours in class; however, the students routinely evidence the highest, or near

highest, average scores in science, reading, and mathematics Sahberg and Oldroyd (2010).

Why is this true? Is it that South Korean and Finish children are smarter than those in the United States and, if so, would this suggest that the curriculum is irrelevant? Jensen (1969) and Gottfredson (2003) would concur with this statement. However, there is an interesting phenomenon that is becoming very popular in the United States that further muddles the explanation of why some children learn at a rate beyond that would be expected based on their level of intelligence. This is a method called *Khan Academics*. It is a free Internet-based program with a library of over 2,700 videos that provide instruction and practice exercises with numerous subjects ranging from basic arithmetic to thermodynamics. What is similar to the Finish educational system is that the child progresses at his or her own rate in areas that they are interested.

## What Does Not Work

What preschool children watch on television may negatively affect their ability to learn.

Lillard and Peterson (2011) randomly assigned 64-year-old children to one of three conditions: watching 9 min of a fast-paced fantastical cartoon (SpongeBob SquarePants), a slow-paced Public Broadcasting Service educational cartoon, or drawing pictures with crayons. The results were dramatic. Watching the brief 9-min SpongeBob clip immediately and substantially impaired the children’s ability to learn, at least in the short term. The researchers did not examine how long the detrimental effects endured.

## Summary

Certainly, intellectual functioning is influenced by both genetic and environmental factors. In consideration of the research findings associated with heterosis and epigenetics, it is without doubt that there are not just genetics and environment but also genetics interacting with the

environment. Studying how the environment is conducive to gene expression may lead to both revolutionary developments in education and promotion of intellectual functioning.

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## Mentoring During Childhood

Preston A. Britner and Kellie G. Randall  
Department of Human Development &  
Family Studies, University of Connecticut,  
Storrs, CT, USA

### Introduction

In recent years, mentoring has become a popular strategy for fostering health development and preventing negative outcomes for youth, particularly those considered at risk. It is estimated that three million youth are in mentoring relationships based in formal programs in the U.S. (Rhodes & Lowe, 2009). Additionally, government agencies have invested money in programs that provide mentoring to at-risk children. Enthusiasm for mentoring as a practice has, at times, run ahead of the research base regarding its effectiveness. Increasingly, however, researchers are focusing on documenting program outcomes and effective practices in mentoring relationships. We explain the concept of mentoring children as a prevention strategy, including a review of theory, research, and practice.

Much of the research in youth mentoring has focused on adolescents or has used samples that range from childhood to adolescence. However, there are issues unique to mentoring children; Cavell and Smith (2005) discuss both the potential barriers and benefits in mentoring children rather than adolescents. They suggest that a potential disadvantage of focusing on younger children is that the children's verbal and cognitive capacities can limit the scope of mentoring (e.g., make communication more difficult or not allow for explorations of identity). Advantages are that most potential mentors will find children (rather than adolescents) to be more approachable, receptive, and malleable, and that prevention – before significant problem behaviors and patterns exist – will be more effective than intervention after the fact.

### Definitions and Scope

Rhodes (2002) provided a useful definition of mentoring as "...a relationship between an older, more experienced adult and an unrelated, younger protégé – a relationship in which the adult provides ongoing guidance, instruction, and encouragement aimed at developing the competence and character of the protégé" (p. 3). Mentoring may occur informally or in structured programs. In this entry, we focus on formal mentoring programs, because much of the research on childhood mentoring is done in the context of formal programs. Instead of relying on mentoring relationships to form naturally, programs use a systematic approach to help youth and adults develop partnerships. Formal mentoring programs may use evidence-based and standardized policies, or best practices, to match adults and children and to ensure that mentoring relationships effectively meet the needs of the population being served (Britner & Kraimer-Rickaby, 2005; Thompson & Kelly-Vance, 2001).

Formal programs mostly fall into two categories: community-based and school-based. In community-based mentoring, the mentor and protégé usually determine the frequency of their meetings, which may be an hour a week or a little as once a month, as well as the location. In-person meetings can take place at school or other community settings, such as a movie theater or a recreational center.

Alternatively, in school-based programs, mentoring takes place during the school day; typically the mentor and protégé spend 1 h a week together engaging in academic and social activities (Herrera, 2004). Compared to community-based programs, school-based programs are more likely to serve children who are having academic or behavioral difficulties in school and/or who have repeated a grade (Herrera, Sipe, & McClanahan, with Arbretton, & Pepper, 2000). In this endeavor, school-based mentoring programs are often more structured and place greater emphasis on improving students' academic performance than community-based programs (Portwood & Ayers, 2005). Traditionally, most

mentoring programs have been community based, but the simplified logistics (i.e., taking place during school hours and using the schools as a meeting place) of mentoring within schools combined with schools' needs to find ways to help individual students succeed has led to an increase in school-based mentoring.

## Theories

Several models have been presented to describe the process of how mentoring might "work." The most widely cited of these models is Rhodes' "pathways of mentoring influence" model. The model of youth mentoring proposed by Rhodes (2002) suggests that there is a crucial step to mentoring in which mentor and youth protégé form an emotional bond. Theoretically, only then can the mentor influence the youth's developmental outcomes by (a) enhancing social skills and emotional well-being, (b) improving cognitive skills through dialogue, and (c) serving as a role model and advocate for the youth.

Positive mentoring relationships can foster social and emotional development by challenging the children's views of themselves in relationships, by providing a "corrective experience" that generalizes to other relationships, by helping children regulate their emotions, and by alleviating relationship stress. Mentoring relationships can enhance identity development through positive role modeling and also enhance cognitive development through dialogue and listening (Rhodes, 2002).

Whereas Rhodes' model is the most popular, other researchers have proposed ideas to explicate how mentoring works. For example, Parra, DuBois, Neville, Pugh-Lilly, and Povinelli (2002) presented a structural model in which mentoring, followed by the development of a significant bond, widens the youths' social support networks, which in turn bolsters self-esteem. By encouraging trust, autonomy, and initiative, mentors enhance resilience in development. Many mentoring researchers place a strong emphasis on self-esteem as a key variable for determining resilience in childhood (see entry

on "Self-Esteem During Childhood"). Larose and Tarabulsky's (2005) sociomotivational perspective portrays structure, involvement, and support for autonomy as key elements for student motivation and academic achievement in mentoring programs for academically at-risk children. Keller's (2005) systemic conceptual model considers the interdependent network of relationships established between mentor, child, parent/guardian, and caseworkers against the ecological backdrop of agency policies and procedures. Ironically, this important "relationship" focus has rarely been applied to studies of mentoring as embedded within larger social systems (Britner & Kraimer-Rickaby, 2009).

## Current Research

The prevalence of and support for mentoring programs has grown in recent years at a faster rate than the body of research on their practices and outcomes. When studies have been conducted in the past, many have suffered methodologically from an over-reliance on anecdotal, observational, and/or self-report data and a failure to conduct rigorous statistical analyses (Rhodes, 2002). However, there is an increasing body of literature on the efficacy and effectiveness of various mentoring programs to meet the needs of children.

In this section, we begin by presenting broad results from two meta-analyses on the impact of mentoring. We then examine some specific studies that address child outcomes and mentoring. Many studies of mentoring utilize samples that include both children and adolescents. Therefore, we conclude this section with a brief discussion of what is known about the differences in mentoring children versus adolescents.

### Meta-analyses

DuBois, Holloway, Valentine, and Cooper (2002) published a widely cited and comprehensive meta-analysis of the impact of mentoring in studies published through 1998. Five outcomes were examined: emotional/psychological, problem/high-risk behavior, social competence,

academic/educational, and career/employment. Mentoring was found to have a measurable, significant effect on children and adolescents; however, the effect size was relatively small (0.14 and 0.18 under the assumptions of fixed and random effects, respectively). In particular, it was found that career development outcomes, academic outcomes, and problem behaviors were influenced by mentoring (DuBois et al., 2002).

More recently, DuBois, Portillo, Rhodes, Silverthorn, and Valentine (2011) completed a meta-analysis of 73 independent evaluations of mentoring programs published from 1999 to 2010 (i.e., the era after the first meta-analysis). Findings were largely consistent with the earlier analysis, with additional support for gains in social competence or emotional well-being. The authors conclude that modest effects (i.e., approximately a 9 % point advantage for mentored children over non-mentored children) are typical, across domains, within the programs profiled in the analysis.

An important consideration in using mentoring as a prevention strategy is its usefulness with certain at-risk populations. The DuBois et al. (2002, 2011) meta-analyses both found that children from backgrounds of moderate levels of risk (defined broadly) have the most to gain and tend to benefit the most from mentoring, especially when best practices are employed and strong relationships are formed. This finding supports the use of mentoring as a prevention strategy.

### Specific Study Outcomes

Whereas a variety of outcomes were examined in the meta-analyses cited above, most of the individual studies on mentoring in childhood focus on academic outcomes. These are discussed here in two categories: school performance and academic self-concept. There have also been some findings relating to social development, which are also discussed.

*School performance.* Mentoring is often promoted as a remedy for children who are academically at risk or already failing in school (Larose & Tarabulsky, 2005). Research exploring this assertion has yielded mixed results. Thompson

and Kelly-Vance (2001), using a small sample of 12 boys involved in Big Brothers Big Sisters and 13 boys who were on the waiting list for the program, reported that mentored children made significantly higher gains on a standardized intelligence test than the control group, even after controlling for ability.

Herrera, Grossman, Kauh, and McMaken (2011), with a large sample of 1,139 youth, conducted a random assignment study of the Big Brothers Big Sisters School-Based Mentoring program; 565 youth were assigned to the treatment group to receive mentoring and 547 youth were placed on agency wait lists to serve as a control group. Youth were followed for 1.5 school years; after the first year, the mentored youth performed better academically (as measured by teacher reports) than did the control group youth.

Not all studies find improvement in academic performance. Kolar and McBride (2011) studied a sample of 160 at-risk students in first through sixth grade who participated in a Big Brothers Big Sisters mentoring program. At the end of the program, there were a number of improvements on some psychological variables, but no improvements in grades were found. Similarly, Karcher (2008), in a study of 516 (mostly Latino) youth randomized to supportive services or supportive services plus mentoring, found no effect on grades but several positive social outcomes (which varied by sex and age).

*Academic self-concept.* Previous research suggests that mentored students may benefit academically from the presence of a mentor by a change in their academic self-perceptions. A meta-analysis suggests that although the effect is small, positive self-beliefs, in fact, predict later achievement, particularly for the academic domain (Valentine, DuBois, & Cooper, 2004). Guay, LaRose, and Boivin (2004) found that school-age children's academic self-concept predicted educational attainment level 10 years later.

In the Herrera et al. (2011) Big Brothers Big Sisters School-Based Mentoring study, the randomly assigned treatment group reported greater improvement in perceptions of their

academic abilities than youth in the control group. Given the promise of past research and the constant pressure on public schools to “leave no child behind,” school-based mentoring and its possible link to enhanced academic outcomes should continue to be explored.

*Social and emotional development.* Elledge, Cavell, Ogle, and Newgent (2010) studied the impact of a school-based lunchtime mentoring program for bullied children in grades 4 and 5. The 24 students in the treatment group met with a college student mentor twice a week for one semester. In the study, there were two control groups: a “same” control group made up of 12 students and the same school and a “different” control group of 12 children from another school. At the conclusion of the program, treatment children experienced greater reductions in peer reports of peer victimization than children in the “different” control group. However, there were no statistically significant differences between treatment children and the “same” control group; the small sample sizes might have made it difficult to detect changes, but until further research is done, it is unclear what the full impact one-on-one mentoring might have on children who are bullied.

In the Kolar and McBride (2011) study, there were improvements on a number of psychological variables. Pre-/post-analyses found that children liked school better, had better classroom behavior, got along better with peers, and had increased self-esteem after a year spent with a mentor. The authors conclude that a relatively short period of school-based mentoring can have important impacts on at-risk youth; while these results are positive, they should be interpreted with caution, as there was no control group included in the study.

Focusing on different risk populations, several recent studies have found effects of mentoring, often combined with other skills training, on social and emotional outcomes. Jent and Niec (2009) randomly assigned 86 children (ages 8–12 years) accessing services at a community mental health center to a group mentoring intervention or wait-list control group; the mentored children reported improved social problem-solving

skills, and their parents reported that the children had decreased internalizing and externalizing behavior problems. Kuperminc, Thomason, DiMeo, and Broomfield-Massey (2011) found that urban girls in a youth development program who were also mentored were more likely than the program’s non-mentored girls to experience gains in social acceptance and body image. Taussig and Culhane (2010) employed a randomized control trial design to test the effectiveness of the Fostering Healthier Futures (FHF) intervention with 9- to 11-year-old children in foster care. The intervention group ( $n = 79$ ) received an assessment, a manualized skills curriculum, and a 30-week mentoring program with graduate social work students. At a 6-month follow-up, the intervention group – relative to the control group ( $n = 77$ ) – had fewer mental health problems and symptoms of dissociation, and they were also less likely to have received mental health treatment.

### Research on Childhood Versus Adolescent Mentoring

The age and developmental characteristics of the mentee can impact mentoring relationship. There is a larger literature on adolescents (see entry “► [Mentoring During Adolescence](#),” this volume). Some researchers have found that the mentoring relationships of children are closer than those of older adolescents (Britner & Kraimer-Rickaby, 2009; Herrera et al., 2000). Additionally, mentoring relationships with children have a lower risk of early termination (Grossman & Rhodes, 2002) and generally have a longer duration (Rhodes & Lowe, 2009) than those of older adolescents. In their meta-analyses, however, DuBois et al. (2002, 2011) found that effect sizes were similar across different mentee age groups (childhood/early adolescence vs. middle/late adolescence).

### Overview of Strategies

Research on mentoring has primarily been concerned with whether specific programs are associated with improved outcomes for children.

There are many different mentoring programs; they range from programs with a single site to programs that are widely administered across many sites. Due to this variability in the nature of programs, very few have been able to conduct large-scale, high-quality evaluations to provide the needed evidence to conclude they “work.” These programs are presented in the next section. There has been a recognition among researchers that much of the impact of mentoring depends on the quality of implementation (DuBois et al., 2002, 2011). Moving beyond simply determining if a program “works” or not, many researchers have focused on determining program-related practices that contribute to the success of mentoring relationships. Because these studies often do not focus on any one particular program, they provide generalizable findings that can be implemented in a variety of mentoring practice settings.

## What Works

A search of the research literature did not uncover an intervention that met the standard of three successful trials. Nevertheless, there is evidence for other interventions and strategies that – while not meeting the above criteria – yield considerable amounts of evidence and therefore are widely considered as empirically based. These interventions and strategies are described in the next section. Meanwhile, efforts continue to conduct rigorous research on mentoring during childhood.

## What Is Promising

There are some general program characteristics that seem to enhance the likelihood of producing positive outcomes. The DuBois et al. (2002, 2011) meta-analyses found that programs demonstrate a larger effect for mentoring when certain best practices are present. Examples of these practices, which increased relationship intensity and longevity, include more than 2 h of intensive training for mentors, structured group activities

for mentors and youth, and a system for ongoing monitoring of the mentor-protégé match (DuBois et al., 2002). Other research supports the impact of “best practices.” For example, practices such as mentor screening, support, and supervision were identified as predictors of more positive outcomes for mentored children (Grossman & Tierney, 1998; Herrera, 2004).

Most program-level mentoring strategies can be considered “promising practices.” Many have shown positive results, but only in a few studies or in studies that have methodological flaws and/or small sample sizes. Some have shown mixed results across studies and more research is needed to clarify the circumstances under which the strategies are most effective. To date, two programs have been studied frequently enough with consistently positive results to confidently say they stand out as “promising” during childhood: Big Brothers Big Sisters and Across Ages. Presented below are summaries of these two programs and an overview of the research that supports their effectiveness.

### Big Brothers Big Sisters

Big Brothers Big Sisters is a highly structured program that facilitates one-on-one mentoring relationships for 5- to 18-year-olds who primarily come from single-parent families. Big Brother Big Sisters is purely a mentoring program; this makes it unique from other programs which provide mentoring as one part of an array of services. Big Brothers Big Sisters is one of the most widely recognized programs; the agency estimates that it serves 245,000 youth across 370 separate agencies (Big Brothers Big Sisters, 2009).

Big Brothers Big Sisters is the focus of the most influential study on the impact of one-on-one mentoring on the lives of youth conducted to date. The study followed 959 youth (487 received mentors; 472 were waiting list controls) between the ages 10 and 14 years over a period of 18 months, while the treatment youth were participating in the Big Brothers Big Sisters program (Tierney, Grossman, & Resch, 1995). Many of the youth had experienced several parental factors that placed them at risk, including parental

divorce or separation or a family history of substance abuse or domestic violence (Grossman & Tierney, 1998).

Following the intervention, youth in the treatment group showed significant differences relative to the waiting list control group in the domains of antisocial behavior, academic achievement, and family and peer support. Compared to youth who did not have a mentor, youth who had mentors for at least 1 year were 46 % less likely to initiate drug abuse (70 % less for minority youth) and 27 % less likely to start using alcohol. These youth were also 32 % less likely to hit someone, and they skipped, on average, 42 % fewer days of school (Tierney et al., 1995).

In the evaluation of the school-based Big Brothers Big Sisters model (Herrera et al., 2011), mentees exhibited higher academic achievement (as measured by teacher report) and more positive perceptions of their academic abilities. Herrera et al. did not find any differences between mentees and wait-list youth in perceptions of their self-worth, relationships with their parents, or rates of problem behavior. They suggest that the school-based programs may impact primarily school-related outcomes, whereas community-based models may influence a broader range of outcomes.

### **Mentoring Plus: Across Ages**

According to Sipe (1996), combining mentoring with other services may increase the efficacy of the mentoring relationship to promote positive outcomes for youth. The most widely cited example of a “mentoring plus” model is Across Ages. Across Ages is an intergenerational and comprehensive drug prevention program that provides youth with older mentors (aged 55 and older). In addition to mentoring, Across Ages provides youth with community service activities, positive youth development (e.g., life skills development), and parental involvement. It is the only program with a mentoring component that has been identified as a “model program” through the Substance Abuse and Mental Health Administration’s National Registry of Evidence-based Programs and Practices

(Substance Abuse and Mental Health Service Administration, 2008).

LoSciuto, Rajala, Townsend, and Taylor (1996) investigated the effectiveness of the Across Ages program using a random assignment pretest-posttest design; 159 youth were divided into three groups: group C, the control group; group PS, which was comprised of youth who received positive youth development, participated in community services activities, and had parent workshops; and group MPC, which was made up of youth who received mentoring in addition to positive youth development, community services activities, and participated in parent workshops. Youth were followed for one academic year. Youth who received mentoring in combination with other services had fewer absences from school, used drugs less frequently, and had a more positive attitude toward school, the future, and elders.

In another study of the Across Ages program (Aseltine, Dupre, & Lamlein, 2000), the most dramatic changes in self-confidence also were attributable to the combination of mentoring, community service, and positive youth development curriculum. Perhaps because of the experimental research findings and the program’s flexible delivery (in school- or community-based settings), Across Ages has maintained its popularity, while some other models have fallen out of favor.

### **What Does Not Work**

Poor mentoring relationships and matches that disrupt within 3 months or matches that meet inconsistently can have negative emotional, psychological, and cognitive consequences (Grossman & Rhodes, 2002; Sipe, 1996). For example, Grossman and Rhodes (2002) found that Big Brothers Big Sisters youth whose matches terminated within the first 3 months suffered significant declines in their global self-worth and their perceived scholastic competence; conversely, relationships that lasted more than 12 months reported the greatest number of positive outcomes (Grossman & Rhodes, 2002).



In a study of the Big Brothers Big Sisters School-Based program (using the same samples as the Herrera et al. study discussed above), Grossman, Chan, Schwartz, and Rhodes (2011) found that although treatment children on average had academic improvements, children whose match terminated prematurely did not experience any such improvement. Additionally, children who were rematched after a failed mentoring relationship actually showed negative impacts. In order to detect any benefit, Rhodes (2002) has suggested that mentors meet with their protégés for a minimum of 4 h per month for at least 1 year.

## Summary

Whereas some questions remain about the overall effectiveness of mentoring in childhood, we do know that when implemented effectively mentoring can be an effective prevention strategy. Both community- and school-based programs have demonstrated impacts on children's academic performance, academic self-concepts, and social/emotional development, though there are often limits to the effectiveness of any one program (e.g., attitudes toward school improve but grades do not). Mentoring usually works best for children who have a moderate level of risk, making it an appealing prevention strategy. Additionally, the idea has been put forth that mentoring that begins in childhood, as opposed to in adolescence, might be more effective as it serves a protective function and can help prevent children from going on to develop negative behaviors.

Perhaps most important to keep in mind when reviewing the effectiveness of mentoring is that most of the benefits of mentoring accrue only after mentor and mentee have spent a significant amount of time together; short-term or failed matches can have no effect or even negative effects. When mentoring takes place within formal programs, as is the case in many instances, it is important that programs follow best practices as far as recruiting, training, and assigning mentors.

## See Also

- ▶ [Mentoring During Adolescence](#)
- ▶ [Resiliency During Childhood](#)
- ▶ [Social and Emotional Learning During Early Childhood](#)

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## Nutrition During Early Childhood

David L. Katz<sup>1</sup>, Valentina Vinante<sup>2</sup> and Kimberly Doughty<sup>3</sup>

<sup>1</sup>Yale-Griffin Prevention Research Center, Derby, CT, USA

<sup>2</sup>Department of Public Health, University of Florence, Florence, Italy

<sup>3</sup>Yale-Griffin Prevention Research Center, Derby, CT, USA

### Introduction

Nutritional status between conception and the age of 5 years is strongly associated with growth and development. Children in this age group are uniquely vulnerable to the adverse effects of dietary deficiencies, both physiologically, because of high metabolic demand, and socially, because of lack of autonomy. This age group may be particularly vulnerable to the long-term sequelae of overnutrition as well, with increasing evidence that overweight early in life predicts later obesity – as does maternal overnutrition during pregnancy. The primary prevention of short- and long-term sequelae of both over- and undernutrition in this age group is achievable through the application of health and nutrition knowledge, the provision of social services, and the exercise of political will.

### Definitions

In utero growth and development is divided into the *embryological period* (approximately first 12 weeks following conception) during which organ systems are forming and the *fetal period* (the latter two trimesters of pregnancy) during which organ systems have all formed and are maturing. The *neonatal period* refers to the first 1 month of life following birth. *Infancy* begins at the end of the neonatal period and lasts until 12 months of age. The definition of *early childhood* varies but usually refers to the period of time before formal schooling begins, up to age 5. *Malnutrition* generally refers to deficient

intake of macronutrients (i.e., protein, carbohydrate, fat) and/or micronutrients (i.e., vitamins, minerals). However, adverse nutrition may be either deficient or excessive; *overnutrition* is also a form of malnutrition.

### Scope

Optimal nutrition has the potential to promote cognitive and physical development and to prevent infectious disease or mitigate its consequences (Haider, Yakoob, & Bhutta, 2011). In contrast, varying degrees of suboptimal nutrition threaten physical and cognitive development, impair sensory organ function and impair immune function, and increase susceptibility to infectious disease and its consequences. In developing countries, the most prevalent and dire hazards of malnutrition during the period from conception through early childhood are undernutrition and hunger (manifesting as wasting, stunting, and vulnerability to infection) and specific nutrient deficiency syndromes (e.g., deficiency of vitamin A resulting in xerophthalmia, of iron resulting in anemia, of zinc leading to increased respiratory infections and diarrhea). In developed countries, the most prevalent nutrition-related problems in early childhood include congenital abnormalities, low birth weight (LBW), macrosomia or large for gestational age (LGA), obesity, micronutrient deficiencies, and suboptimal nutrient status, such as relative deficiency of omega-3 fatty acid intake. Although severe undernutrition and hunger are not common in the developed world, food insecurity and micronutrient deficiencies resulting from “hidden hunger” are salient, particularly among children from low-income families.

The prevalence of birth defects in the USA is approximately 32 % of all live births. The prevalence of some severe birth defects is higher when stillbirths and terminations are considered. For example, the rate of anencephaly is 0.55 per 10,000 live births but 2.54 per 10,000 including stillbirths and terminations. Birth defects account for 20 % of infant mortality in the USA and in 2004 were associated with \$2.6 billion in hospital costs alone (Parker et al., 2010).

Excess energy intake, a particular threat in countries of the West, has the potential to promote childhood obesity, diabetes, and susceptibility to other chronic degenerative diseases in adulthood. The rate of obesity among young children aged 2–5 years was approximately 10 % in 2005–2008 (U.S. Department of Health and Human Services, n.d.). There is some evidence that fetal undernutrition or overnutrition may predispose infants to obesity, insulin resistance, and cardiovascular disease in adulthood. Both large for gestational age and low birth weight, particularly when combined with subsequent excess energy intake and weight gain, are associated with these long-term risks (Cox & Phelan, 2008). In 2010, the rate of LBW in the USA was 8.15 % (Martin et al., 2012). The rate of LGA was 8.9 % in the overall population in 2005 (Donahue, Kleinman, Gillman, & Oken, 2010). It is estimated that two billion people worldwide subsist on diets lacking essential nutrients needed for growth, development, and physiological maintenance, and 925 million people are undernourished, lacking sufficient food to meet their basic nutritional needs for protein and energy (World Hunger Education Service, 2011). On the contrary, people from Western, affluent countries suffer mainly from overnutrition.

Micronutrient deficiencies are relatively uncommon in the USA compared with developing countries. However, deficiencies are of concern for certain micronutrients in specific populations. Subclinical insufficiency is also fairly prevalent for several nutrients.

Anemia is the most common nutrient-related abnormality of pregnancy and is attributable to iron deficiency nearly 90 % of the time, with the remainder due primarily to folate deficiency. Maternal hemoglobin during pregnancy should consistently be higher than 11 gm/dl to assure adequate oxygen delivery to the fetus. Iron deficiency anemia has been found to be associated with LBW, preterm births, and developmental delays in infants and children (Sachdev, Gera, & Nestel, 2005; Scholl, 2011). In 2003–2006, 16.1 % of pregnant women in their third trimester were anemic, and the target for Healthy People 2020 is to reduce the number to 10 % or less. During the period of

2005–2008, the rates of iron deficiency were 15.9 % for children aged 1–2 years and 5.3 % for children aged 3–4 years. The goals are to reduce the rates to 10 % and 1 % for these respective age groups by 2020 (U.S. Department of Health and Human Services, n.d.).

Deficiency of vitamin D, typically defined as serum 25-hydroxyvitamin D concentration between 10 and 15 ng/mL, is rare among young children in the USA; in 2003–2006, the prevalence of low serum 25-hydroxyvitamin D (<12 ng/mL) was 0.7 % among children ages 1–5 years (Centers for Disease Control and Prevention [CDC], 2012). Approximately 9 % of this population had suboptimal vitamin D status (12–20 ng/mL). However, infants and children living in the northern USA, particularly during winter months, are at greater risk for deficiency. Among neonates born in Boston, Massachusetts, between October and February, prevalence rates of vitamin D deficiency and insufficiency were 9.7 % and 56.4 %, respectively, among white neonates and 45.6 % and 46.8 % among black neonates. Exclusively breastfed infants are also at risk if they do not receive supplements. In one study, 78 % of these infants were vitamin D insufficient in the winter (Rovner & O'Brien, 2008). Vitamin D status is also a concern during pregnancy. In the USA, approximately 7 % of pregnant or lactating women are at risk of deficiency and 21 % are at risk of inadequacy (Looker et al., 2011).

In the USA alone, it is estimated that national health-care expenditures for 2010 totaled \$2.6 trillion, of which 30 % were related to inappropriate diet (Thorpe, 2006). However, these estimates are crude, as the actual costs over time of, for example, subtle impairments in cognitive function attributable to suboptimal nutrition at a population level are largely incalculable.

## Theories

Childhood overweight and obesity, arguably the most pressing nutrition problem among children in the USA, is often conceptualized using one of several variations of a social ecological model.

One such model, ecological systems theory (EST), emphasizes the importance of context in human development (Davison & Birch, 2001). The contexts that are important to child development include, from the most to least immediate, the family, school, community, and society. Individual child characteristics, such as age and gender, interact with characteristics within the other contexts to influence children's weight status. Research based on EST acknowledges the multiple levels of influence in the environment. An adaptation of EST that emphasizes the specific contextual factors influencing behaviors within the family is the Family Ecological Model (Davison, Jurkowski, & Lawson, 2012). This model may be particularly useful for research focused on parenting and family characteristics.

The theory of planned behavior (TPB) is another prominent behavioral theory in child nutrition. The TPB describes the interaction of perceived behavioral control, attitudes, and social norms influencing behavioral intention. Behavioral intention is assumed to predict behavior. (Ajzen, 1991). The TPB has been applied to research in breastfeeding (REF) and child feeding practices (Swanson et al., 2011).

## Current Research

During pregnancy, the increased micronutrient requirements exceed the increased energy requirements. Therefore, vitamin supplementation during pregnancy is universally indicated, and the nutrient density of foods assumes increased importance. The prevention of micronutrient deficiencies is a prime concern for pregnant women, even in developed countries.

There is definitive evidence that periconceptional folate supplementation decreases the incidence of neural tube defects (Cox & Phelan, 2008). The maternal diet is often deficient in calcium, iron, vitamin D, and other micronutrients, and supplementation with a prenatal vitamin throughout pregnancy is indicated. Vitamin A at doses in the range of 10,000 IU per day is teratogenic and to be avoided during pregnancy. Carotenoids with

vitamin A activity are safe. Caloric needs rise in pregnancy, but excessive weight gain is potentially disadvantageous to both mother and fetus.

The Institute of Medicine recommends that women who are normal weight prior to pregnancy gain between 25 and 35 lb. Underweight women should gain 28–40 lb, overweight women 15–25 lb, and obese women just 15 lb. Underweight in the mother is associated with preterm birth, low birth weight, and perinatal morbidity and mortality. Maternal overweight is associated with increased risks of gestational hypertension, diabetes, and preeclampsia in the mother and macrosomia, congenital anomalies, neonatal infections, hypoglycemia, and respiratory distress in infants. Delivery complications including Cesarean sections and stillbirths are also more likely (Cox & Phelan, 2008). Nutritional support of malnourished women during pregnancy is, in general, approached as is malnutrition under other circumstances. The topic has been previously reviewed (Hamaoui & Hamaoui, 2003).

In general, pregnancy requires a calorie increase over baseline of approximately 300 kcal/day, and lactation requires 500 kcal/day. Nutrients for which the recommended daily allowance (RDA) is specifically raised in pregnancy include total protein, total energy, magnesium, iodine, zinc, selenium, vitamin E, vitamin C, thiamin, niacin, iron, calcium, and folate. Lactation requires further increases in protein, zinc, vitamin A, vitamin E, vitamin C, and niacin. Requirements for iron and folate actually decline (see Table 1). These adaptations in the maternal diet are necessary to assure optimal nutrition for the fetus/newborn.

Human milk is appropriate as the sole source of infant nutrition for up to 6 months provided it is free of dangerous contaminants or pathogens (e.g., the HIV). There is uncertainty whether milk meets all of the infant's nutritional needs beyond this point. Breastfeeding, under most circumstances, is the preferred nutritional source for neonates. A generous intake of dietary calcium, and continued use of prenatal vitamins, is indicated throughout the period of lactation.

Breast milk and infant formulas differ substantially in a variety of nutrients (Huisman

**Nutrition During Early Childhood, Table 1** Recommended nutrient intake changes associated with pregnancy and lactation, select nutrients. Entries are recommended dietary allowances (*RDA*) or adequate intake (*AI*) levels

Nutrient	Recommended intake by subject category			
	Female, age 19–30	Female, age 31–50	Pregnancy age 19–30	Lactation age 19–30
Calcium	1,000 mg	1,000 mg	1,000 mg	1,000 mg
Chromium	25 µg	25 µg	30 µg	45 µg
Folate <sup>a,b</sup>	400 µg	400 µg	600 µg	500 µg
Iodine	150 µg	150 µg	220 µg	290 µg
Iron	18 mg	18 mg	27 mg	9 mg
Magnesium	310 mg	320 mg	350 mg	310 mg
Niacin <sup>c</sup>	14 mg NE	14 mg NE	18 mg NE	17 mg NE
Protein	46 g	46 g	71 g	71 g
Riboflavin	1.1 mg	1.1 mg	1.4 mg	1.6 mg
Selenium	55 µg	55 µg	60 µg	70 µg
Thiamin	1.1 mg	1.1 mg	1.4 mg	1.4 mg
Vitamin A <sup>d</sup>	700 µg RE	700 µg RE	770 µg RE	1,300 µg RE
Vitamin B12	2.4 µg	2.4 µg	2.6 µg	2.8 µg
Vitamin B6	1.3 mg	1.3 mg	1.9 mg	2.0 mg
Vitamin C	75 mg	75 mg	85 mg	120 mg
Vitamin D <sup>e,f</sup>	15 µg	15 µg	15 µg	15 µg
Vitamin E <sup>g</sup>	15 mg TE	15 mg TE	15 mg TE	19 mg TE
Vitamin K	90 µg	90 µg	90 µg	90 µg
Zinc	8 mg	8 mg	11 mg	12 mg

Adapted by author, 2012

Sources: Dietary Reference Intakes for Calcium, Phosphorous, Magnesium, Vitamin D, and Fluoride (1997); Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline (1998); Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids (2000); Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc (2001); Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate (2005); and Dietary Reference Intakes for Calcium and Vitamin D (2011). These reports may be accessed via [www.nap.edu](http://www.nap.edu)

<sup>a</sup>As dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folic acid from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach

<sup>b</sup>In view of evidence linking folate intake with neural tube defects in the fetus, it is recommended that all women capable of becoming pregnant consume 400 µg from supplements or fortified foods in addition to intake of food folate from a varied diet

<sup>c</sup>As niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE)

<sup>d</sup>As retinol activity equivalents (RAEs). 1 RAE = 1 mg retinol, 12 mg **b**-carotene, 24 mg **a**-carotene, or 24 mg **b**-cryptoxanthin. The RAE for dietary provitamin A carotenoids is twofold greater than retinol equivalents(RE), whereas the RAE for preformed vitamin A is the same as RE

<sup>e</sup>As cholecalciferol. 1 µg cholecalciferol = 40 IU vitamin D

<sup>f</sup>Under the assumption of minimal sunlight

<sup>g</sup>As **a**-tocopherol. **a**-Tocopherol includes **RRR**-**a**-tocopherol, the only form of **a**-tocopherol that occurs naturally in foods, and the **2R**-stereoisomeric forms of **a**-tocopherol (**RRR**-, **RSR**-, **RRS**-, and **RSS**-**a**-tocopherol) that occur in fortified foods and supplements. It does not include the **2S**-stereoisomeric forms of **a**-tocopherol (**SRR**-, **SSR**-, **SRS**-, and **SSS**-**a**-tocopherol), also found in fortified foods and supplements

et al., 1996). The significance of all of the differences has yet to be established. Human milk contains a variety of nutrient and non-nutrient compounds, including secretory IgA (sIgA), oligosaccharides which promote the growth of beneficial gut bacteria, cytokines, lactoferrin,

essential fatty acids, enzymes, hormones, and growth factors, among others. Provided that a sanitary water supply is available, the safety of formula is generally not of concern. Soy-based formulas are available for infants intolerant of bovine milk protein. Properly



nourished, the healthy infant should double in weight by 4–5 months and triple in weight by 12 months. Demand feeding is the preferred method of assuring adequate energy intake.

The epidemiology of nutrition-related health problems in children in developed countries has changed dramatically in the latter half of the twentieth century. Childhood obesity is considerably more common in the USA than is over malnutrition. Most children consume calories, sugar, and total dietary fat in excess of recommendations and fail to consume the recommended quantities of fruits and vegetables (Garipagaoglu et al., 2008; St-Onge, Keller, & Heymsfield, 2003).

In the USA, dietary guidelines for the general population begin at or around age 2 years; a transition from breast milk to a variety of nutritious foods is advised starting at about 6 months of age and extending through the first year of life (Gidding et al., 2006; U.S. Department of Agriculture [USDA], 2010).

**Overview of Strategies**

The period of early childhood encompasses a wide range of developmental stages. Therefore, the discussion of nutrition-related goals for health promotion in this age group is broken down further into three periods: conception to birth, birth through 12 months, and ages 1–5 years. A summary of the most salient goals for each stage is provided in Table 2. In general, strategies for improving nutrition during early childhood include those aimed at preventing micronutrient deficiencies, preventing adverse pregnancy and birth outcomes that may have long-term health consequences, preventing overweight and obesity throughout the life span, and improving overall diet quality by encouraging consumption of healthy foods (e.g., fruits, vegetables, whole grains, low-fat dairy, lean proteins, and unsaturated fat sources) and discouraging consumption of energy-dense/nutrient-poor foods (e.g., added sugars and salt, saturated and trans fats, and refined carbohydrates). The prevention of autoimmune diseases including type 1 diabetes and allergies is also relevant.

**Nutrition During Early Childhood, Table 2** Nutrition-related goals for early childhood by stage of development

Stage of early childhood	Goals
<i>Conception through birth</i>	Prevent birth defects Ensure optimal brain development Achieve appropriate birth weight and gestational length
<i>Birth through 12 months</i>	Ensure adequate growth Ensure optimal cognitive and motor development Prevent anemia and iron deficiency Prevent vitamin D deficiency Prevent infections and allergy Promote development of healthy eating habits to prevent later obesity
<i>Ages 1–5 years</i>	Ensure adequate growth Prevent obesity Promote healthy eating habits to prevent later obesity and chronic disease

**Strategies That Work**

**Conception to Birth**

Optimal development in utero is associated with several nutrients in particular. Supplementation with approximately 400 µg of folic acid per day beginning prior to conception markedly reduces the risk of neural tube defects, including anencephaly and spina bifida. Evidence for this association has been extensively reviewed and is considered definitive (Wolff, Witkop, Miller, & Syed, 2009). Ingestion of more than 1 mg per day of folate is generally not recommended. However, in women with prior pregnancies leading to neural tube defects, the ingestion of up to 4 mg per day of folate may confer additional benefit.

Pregnancy consumes approximately 1,040 mg of iron in total, of which 200 mg is recaptured after pregnancy from the expanded red cell mass and 840 mg is permanently lost. An intake of between 13 and 40 mg per day is recommended during the third trimester for all women. Vitamin/mineral supplements generally contain 30 mg of iron, and diet (in the USA) provides an additional 15 mg, easily meeting the needs of most women without anemia. Women with iron deficiency

anemia during pregnancy require increased intake to replete bone marrow stores and still provide for the metabolic needs of the fetus. In this situation, daily intake of between 120 and 150 mg of iron is typically required. Iron supplementation prior to conception will facilitate meeting the iron needs of pregnancy and lactation, which together result in a net loss of between 420 and 1,030 mg of elemental iron.

To minimize the risk for preterm delivery, low birth weight, macrosomia, and pregnancy and neonatal complications, maternal weight gain should be neither inadequate nor excessive. Ideally, a healthy body weight should be achieved prior to pregnancy. Adverse outcomes are significantly reduced in normal weight, overweight, and obese pregnant women who gain weight within recommended ranges, compared with those who gain excess weight (Crane, White, Murphy, Burrage, & Hutchens, 2009). A 2012 meta-analysis of randomized controlled trials found significant benefits of diet and lifestyle interventions during pregnancy, particularly those that were diet based, on several pregnancy outcomes relevant to infant health (Thangaratinam et al., 2012). Overall, interventions were associated with a significant 1.42 kg reduction in gestational weight gain relative to control conditions. Dietary interventions specifically were associated with a greater reduction of 3.84 kg (95 % CI [2.45, 5.22]). Although there were no significant differences in birth weight or incidence of LGA or SGA, interventions were associated with reduced relative risks of preeclampsia (RR 0.74, 95 % CI [0.60, 0.92]) and shoulder dystocia (RR 0.39, 95 % CI [0.22, 0.70]). Likewise, evidence to date suggests that treatment of gestational diabetes significantly reduces risks of macrosomia, preeclampsia, and shoulder dystocia, without increasing risk of SGA (Falavigna et al., 2012). Among women at risk for hypertension who also have low calcium intakes, calcium supplementation during pregnancy is effective in reducing the risk for preeclampsia (Patrelli et al., 2012).

The *Special Supplemental Nutrition Program for Women, Infants, and Children* (WIC) is designed to meet the nutritional needs of

women and infants in the USA and assists nearly one million women annually in meeting nutritional needs during pregnancy. Prenatal WIC participation has been consistently associated with lower rates of low birth weight and very low birth weight, but this association is weakened by adjustment for gestational age bias (USDA, 2012).

### **Birth to 12 Months**

Evidence is convincing that breastfeeding confers protection against infections, particularly gastrointestinal infections and ear infections. There is also considerable evidence for protection against asthma, obesity, and eczema and possible evidence for protection against atopy (allergy), childhood leukemia, type 1 and type 2 diabetes, Crohn's disease, and respiratory infections (Agostini et al., 2009). The prevailing view is that breast milk favors optimal brain development, and breastfeeding is associated with greater intelligence, at least during childhood, although such observations are subject to confounding.

There are few contraindications to breastfeeding. These include maternal HIV infection or exposure to radiation and the presence of certain inborn errors of metabolism in the infant, such as galactosemia or congenital lactase deficiency. Although medications and environmental contaminants pass into breast milk, most do so in negligible concentrations and pose little to no risk. In most cases, the benefits of breastfeeding outweigh these risks. However, careful selection of medication is advised to minimize the potential for adverse effects (Agostini et al., 2009).

Maternal diet strongly influences the fatty acid and vitamin composition of breast milk but generally exerts a modest influence on minerals, with the exception of iodine (Valentine & Wagner, 2013). Continued use of prenatal vitamins during lactation to maintain sufficient maternal micronutrient status is recommended. It is also recommended that pregnant or breastfeeding women consume 300–1,000 mg of DHA per day. Vitamins D and K are generally at low levels in breast milk, and supplementation is recommended. Breastfed infants should receive

400 IU of vitamin D per day beginning within a few days of birth. Infant formulas already contain this amount of vitamin D. Vitamin K is usually given by injection to all newborns shortly after birth.

Recommended dietary allowances (RDAs) have been established for essential nutrients for both the first and second 6-month intervals of life (see Table 2). Iron deficiency is the most common nutrient deficiency in early childhood. Strategies useful in the prevention of iron deficiency among children include promoting breastfeeding, using iron-fortified formulas if formulas are used, and introducing age-appropriate, iron-rich solid foods (CDC, 1998). Another often overlooked but simple and effective strategy for improving iron status in infants is delayed clamping of the umbilical cord after birth. A 2007 meta-analysis concluded that delaying cord clamping for at least 2 minutes reduced the risks of anemia and iron deficiency at ages 2–3 months by 47 % and 33 %, respectively. Measures of iron status were improved for as long as 6 months (Hutton & Hassan, 2007).

Infant formula is fortified with iron; as a result, iron deficiency is of little concern in formula-fed infants. The American Academy of Pediatrics (AAP) recommends that all breastfed infants receive 1 mg of supplemental iron per kg of body weight beginning at age 4 months and that preterm breastfed infants, who have lower iron stores at birth, receive 2 mg/kg of body weight beginning at 1 month of age and continuing until 12 months (Baker, Greer, & The Committee on Nutrition, 2010). However, the appropriateness of a recommendation for universal supplementation has been questioned because it was based on the findings of few short-term studies demonstrating only modest benefit (Schanler et al., 2011). Ziegler and colleagues assessed iron status among unsupplemented breastfed infants in the USA (Ziegler, Nelson, & Jeter, 2011). Among the 291 infants included, 2.75 % developed iron deficiency anemia (IDA) in the first 6 months of life, but all were born with low plasma ferritin levels, indicating low birth iron endowment. Another 2.75 % developed iron deficiency (ID) in the first 6 months, not all of whom were born with

low birth iron endowment. No infant developed IDA in the second 6 months of life, but 5.6 % developed ID. Iron supplementation beginning as early as 1 month of age is almost certainly advisable in infants who have risk factors for deficiency, namely, preterm delivery, intrauterine growth restriction, low birth weight, maternal iron deficiency, and poorly controlled maternal diabetes (Rao & Georgieff, 2007). Although current guidelines include supplementation in breastfed babies without risk factors beginning at 4 months of age, the effectiveness of this strategy in improving long-term outcomes like growth and cognitive development is not entirely clear.

By 6 months of age, gastrointestinal physiology is substantially mature, and infants metabolize most nutrients comparably to adults. Nutrient needs can be met with breast milk or formula (see Table 3), but most authorities advocate the gradual introduction of solid foods beginning at or around 6 months. Completion of weaning to solid food by 1 year of age is common practice and appropriate. Cow's milk should not be used as a main drink until 1 year of age, mainly because it is not an adequate source of iron (Agostini et al., 2008).

The nutrient recommendations for infants 6–12 months of age are based largely on extrapolation from the first 6-month period; less is known about the nutrient needs of infants 6–12 months old. There is controversy regarding whether introduction of complementary foods should begin at 4 or 6 months of age. However, there is a consensus on the practice of delaying solid foods until at least 4 months. Prior to this time, infants do not have a sufficiently mature gastrointestinal system to digest non-milk foods, nor do they have the motor skills needed to safely eat solid foods. Breast milk and formula supply adequate nutrients during this period of rapid development. Of note, some studies have observed associations between early introduction of complementary foods (before 4 months of age) and greater risk of excess weight gain in childhood (Paul et al., 2009).

In regard to prevention of allergic diseases (e.g., cow's milk allergy, atopic eczema),

**Nutrition During Early Childhood, Table 3** Recommended nutrient intake levels in infancy/early childhood, select Nutrients. Entries are recommended dietary allowances (*RDA*) or adequate intake (*AI*) levels

Nutrient	Age 0–6 months	Age 6–12 months	Age 1–3 years	Age 4–8 years
Protein	9.1 g	11 g	13 g	19 g
Vitamin A <sup>a</sup>	400 µg RE	500 µg RE	300 µg RE	400 µg RE
Vitamin D <sup>b,c</sup>	10 µg	10 µg	15 µg	15 µg
Vitamin E <sup>d</sup>	4 mg α-TE	5 mg α-TE	6 mg α-TE	7 mg α-TE
Vitamin K	2 µg	2.5 µg	30 µg	55 µg
Vitamin C	40 mg	50 mg	15 mg	25 mg
Thiamin	0.2 mg	0.3 mg	0.5 mg	0.6 mg
Riboflavin	0.3 mg	0.4 mg	0.5 mg	0.6 mg
Niacin <sup>e</sup>	2 mg NE	4 mg NE	6 mg NE	8 mg NE
Vitamin B6	0.1 mg	0.3 mg	0.5 mg	0.6 mg
Folate <sup>f,g</sup>	65 µg	80 µg	150 µg	200 µg
Vitamin B12	0.4 µg	0.5 µg	0.9 µg	1.2 µg
Calcium	200 mg	260 mg	700 mg	1,000 mg
Phosphorous	100 mg	275 mg	460 mg	500 mg
Magnesium	30 mg	75 mg	80 mg	130 mg
Iron	0.27 mg	11 mg	7 mg	10 mg
Zinc	2 mg	3 mg	3 mg	5 mg
Iodine	110 µg	130 µg	90 µg	90 µg
Selenium	15 µg	20 µg	20 µg	30 µg
Biotin	5 µg	6 µg	8 µg	12 µg
Pantothenic acid	1.7 mg	1.8 mg	2 mg	3 mg
Copper	200 µg	220 µg	340 µg	440 µg
Manganese	0.003 mg	0.6 mg	1.2 mg	1.5 mg
Fluoride	0.01 mg	0.5 mg	0.7 mg	1.0 mg
Chromium	0.2 µg	5.5 µg	11 µg	15 µg
Molybdenum	2 µg	3 µg	17 µg	22 µg

Adapted by author, 2012

Sources: Dietary Reference Intakes for Calcium, Phosphorous, Magnesium, Vitamin D, and Fluoride (1997); Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline (1998); Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids (2000); and Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc (2001); Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate (2005); and Dietary Reference Intakes for Calcium and Vitamin D (2011). These reports may be accessed via [www.nap.edu](http://www.nap.edu)

<sup>a</sup>As retinol activity equivalents (RAEs), 1 RAE = 1 mg retinol, 12 mg b-carotene, 24 mg a-carotene, or 24 mg b-cryptoxanthin. The RAE for dietary provitamin A carotenoids is twofold greater than retinol equivalents(RE), whereas the RAE for preformed vitamin A is the same as RE

<sup>b</sup>As cholecalciferol, 1 µg cholecalciferol = 40 IU vitamin D

<sup>c</sup>Under the assumption of minimal sunlight

<sup>d</sup>As a-tocopherol, a-tocopherol includes **RRR-a-tocopherol**, the only form of a-tocopherol that occurs naturally in foods, and the **2R-stereoisomeric forms of a-tocopherol (RRR-, RSR-, RRS-, and RSS-a-tocopherol)** that occur in fortified foods and supplements. It does not include the **2S-stereoisomeric forms of a-tocopherol (SRR-, SSR-, SRS-, and SSS-a-tocopherol)**, also found in fortified foods and supplements

<sup>e</sup>As niacin equivalents (NE), 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE)

<sup>f</sup>As dietary folate equivalents (DFE), 1 DFE = 1 µg food folate = 0.6 µg of folic acid from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach

<sup>g</sup>In view of evidence linking folate intake with neural tube defects in the fetus, it is recommended that all women capable of becoming pregnant consume 400 µg from supplements or fortified foods in addition to intake of food folate from a varied diet

exclusive breastfeeding for 4–6 months is the most effective strategy. For infants at high risk of allergic disease who are not breastfed, an extensively hydrolyzed formula should be given until 4 months of age (Muraro et al., 2004).

### **Ages One to Five Years**

Means of assuring optimal nutritional exposure for all children up to age 5 are elusive. Practices of clear value in the prevention of nutritional deficiencies include food supply fortification, nutrient supplements for children at weaning, and the continued efforts of food assistance programs in the USA (e.g., WIC) to protect access to an adequate supply of food energy and nutrients. WIC participation is associated with increased iron density of the diet, increased fruit and vegetable consumption, reduced intake of added sugars, and increased dietary variety. Evidence for effects of WIC on obesity risk is mixed, but the rate of failure to thrive by age 5 is lower among participants than nonparticipants (USDA, 2012).

Although childhood obesity prevention initiatives usually target school-age children, there are several reasons to begin these efforts sooner. By the time children enter school, 20 % are already overweight or at risk for overweight, and many learned eating habits and preferences are already in place (Birch & Ventura, 2009). Efforts to identify effective interventions for this age group are ongoing. There is sufficient evidence, however, that parents and caregivers play a pivotal role in shaping children's eating habits. The frequency and diversity of food exposures and observation of caregivers greatly influence a child's food preferences and willingness to try new foods (Anzman, Rollins, & Birch, 2010). Interventions to improve diet or prevent obesity in preschool settings without a family component have generally been unsuccessful (Hesketh & Campbell, 2010). Therefore, effective strategies will likely require considerable parent involvement. Although experimental evidence in this area is limited, the following parent practices are supported by research: (1) offering healthy foods repeatedly to encourage acceptance and liking, (2) avoiding coercion or restriction of

food intake, and (3) reducing the energy density and portion sizes of foods served to children by age 3–5 years (Birch & Ventura, 2009). There is a strong agreement among experts that minimizing sugar-sweetened beverage intake by young children is a key strategy for reducing obesity risk, as they contribute significant amounts of empty calories to the diet (Paul et al., 2009).

### **Strategies That Might Work**

Whereas vitamin D supplementation in infants is advised to prevent deficiency, the value of supplementation for pregnant women is uncertain and currently under investigation. Low maternal vitamin D status has been consistently associated with increased risk of inflammatory and atopic disorders in children (e.g., asthma and allergies) (Brannon, 2012). There is also some observational evidence for associations between low vitamin D levels and increased risk of preeclampsia, gestational diabetes, and obstructed labor in the mother and type 1 diabetes in children. Given the low risk of adverse effects, vitamin D supplementation during pregnancy may be a useful strategy for promoting infant and child health.

Essential fatty acids are of particular interest with regard to early childhood development. Preliminary evidence suggests that high consumption of marine oils in pregnancy is associated with longer gestation and that maternal dietary supplementation with n-3 polyunsaturated oils may increase the proportion of term births in diverse populations (Koletzko et al., 2008). However, a recent Cochrane review concluded that there was insufficient evidence to support marine oil supplementation in pregnant women as a means to prevent preeclampsia, preterm birth, low birth weight, or small-for-gestational age (Makrides, Duley, & Olsen, 2006). The n-3 fatty acid docosahexaenoic acid (DHA) is critical for normal eye and brain development. In observational studies, higher DHA levels in infants have been associated with improved visual and cognitive function, but a benefit of supplementation in pregnant and lactating women has not been

consistently demonstrated (Dziechciarz, Horvath, & Szajewska, 2010). Increased consumption of n-3 fatty acids may confer health benefits to both mother and baby, but more research is needed. Relative to the prehistoric dietary pattern, the modern diet is deficient in n-3's (Eaton, Eaton, & Konner, 1997) lending the support of an evolutionary context to the hypothesis that increased intake may be beneficial.

The n-3 content of breast milk is mediated by maternal intake. Both eicosapentaenoic acid (EPA) and DHA are relatively abundant in human breast milk and prominently incorporated into the developing brain (Koletzko & Rodriguez-Palmero, 1999). Breastfeeding is associated with enhancement of both IQ and visual acuity in infants (Golding, Rogers, & Emmett, 1997). The apparent health benefits of breastfeeding relative to formula feeding may relate in part to the DHA content of breast milk. Increasingly, long-chain PUFAs including DHA are being added to commercial formulas (Auestad et al., 2003). Although the essential fatty acid,  $\alpha$ -linolenic acid, is a precursor to DHA as well as EPA, conversion to DHA in particular appears to be limited and variable. The putative benefits of DHA apparently require that it be administered directly in the diet (Gibson, Muhlhausler, & Makrides, 2011).

Maternal diet influences the flavor of breast milk and thereby serves as a means of introducing the neonate to a variety of taste experiences (Beauchamp & Mennella, 2011). Strong flavors, and the familiarity or novelty of such flavors, may influence the feeding behaviors of infants. Thus, variation in the maternal diet during lactation may play some role in determining childhood food preferences. There is some evidence to suggest that breastfeeding, especially if protracted, may confer protection against the later development of obesity (Agostini et al., 2009). This topic remains subject to some ongoing debate (Disantis, Collins, Fisher, & Davey, 2011), with some recent evidence suggesting preferential benefit for infants born large for gestational age (Camurdan, Camurdan, Polat, & Beyazova, 2011).

While the principal goal of nutrition management in early childhood is the preservation of optimal growth and development, children in the USA and other developed countries are increasingly susceptible to the adverse effects of dietary excess, particularly obesity. As a result, there is intense interest regarding the age at which dietary restrictions might first be safely imposed. In general, restriction of macronutrients (dietary fat being of particular concern) is discouraged prior to age 2, but it is generally accepted that after this age, restrictions comparable to those recommended for adults are safe and appropriate. The American Academy of Pediatrics (AAP) recommends that children consume a diet that is generally low in saturated fat, based on evidence that cardiovascular disease risk factors appear in childhood, are related to saturated fat intake, and track into adulthood (Gidding et al., 2006). To limit the saturated fat content of the diet, the AAP recommends that children drink whole milk until the age of 2 years and low-fat or nonfat milk thereafter. Although this particular guideline is based in sound logic, it has not been consistently supported by evidence. A recent longitudinal study in over 10,000 American children found that those drinking nonfat or 1 % milk were significantly more likely to be overweight or obese than those drinking 2 % or whole milk at ages 2 and 4 years and were more likely to become overweight or obese between the two time points (Scharf, Demmer, & DeBoer, 2013). The results were adjusted for several potential confounders. Therefore, the effectiveness of promoting low-fat milk for young children has not yet been conclusively determined.

Fruit juice has also been targeted as a potential contributor to excess calorie intake and weight gain in infants and young children. The AAP recommends delaying introduction of 100 % fruit juice until 6 months of age and limiting intake thereafter to 4–6 oz/day as a means to prevent excessive energy intake (Gidding et al., 2006). Some have argued that 100 % fruit juice should be considered similarly as candy and desserts and avoided entirely until at least preschool age, reasoning that fruit juice may contribute to excess fructose consumption and metabolic



syndrome and that calories from juice cannot effectively trigger satiety because of its liquid form (Wojcicki & Heyman, 2012). Nevertheless, the association of 100 % fruit juice consumption with obesity is not as well documented as that of sugar-sweetened beverage intake and has been observed only at excessive intake levels (Paul et al., 2009). Therefore, limiting fruit juice is a strategy whose basis is still mostly theoretical.

### Strategies That Do Not Work

There is currently no convincing evidence that diet restrictions during pregnancy or lactation are effective in preventing allergic disease in infants (Muraro et al., 2004). Likewise, the long-accepted practice of delaying the introduction of potentially allergenic foods (e.g., peanuts, cow's milk, eggs, fish, shellfish) beyond 6 months of age is not supported by research (Szajewska, 2013).

Because parents play such an important role in shaping children's food environments and eating habits, interventions in preschool or child care settings that do not involve parents appear to have limited success (Hesketh & Campbell, 2010). Some common feeding practices are ineffective in, or counterproductive to, improving the quality of children's diets. For example, controlling behaviors such as using food as a reward or punishment, coercing children to eat, or prohibiting unhealthy foods have been associated with reduced self-regulation of intake, overeating, increased liking of restricted foods, and weight gain (Paul et al., 2009).

In the industrialized world, children are early exposed to a vast array of nutrient-dilute, energy-dense foods. Vast sums of money are spent by the food industry on advertisements aimed at children. It is against this backdrop that an epidemic of childhood obesity has developed and progressed. Providing "guidelines" on healthy eating in a "toxic" nutritional environment is clearly ineffective. Strategies for the prevention and control of childhood obesity include an array of interventions mostly aimed at children older than age 6 years; strategies for infants emphasize enhancing

maternal nutrition and weight control and breastfeeding and promoting appropriate complementary feeding practices (Waters et al., 2011).

### Synthesis

The provision of optimal nutrition during infancy and early childhood is of vital importance to growth and development and is likely related to a wide array of health outcomes in later life. The establishment of good nutrition for an infant begins in utero, during which maternal dietary practices may influence fetal metabolism. The most reliable way to assure optimal nutrition for a newborn is breastfeeding. Therefore, based on the confluence of multiple lines of evidence, breastfeeding for a period of 6 months is advisable unless the practice is contraindicated by communicable disease. The maintenance of salutary maternal nutrition during lactation is of importance to the health of both mother and baby. While commercial infant formulas provide generally balanced nutrition, there is a concern that they are deficient in long-chain polyunsaturated fatty acids, DHA in particular. As evidence of the importance of DHA and other essential fatty acids continues to accrue, the composition of commercial formulas will likely be revised. In the interim, there is preliminary evidence that both cognition and vision are enhanced by breastfeeding as compared to formula feeding (Table 4).

Weaning to solid food should generally begin at approximately 6 months; earlier weaning may increase the risk of food allergies and possibly obesity. Weaning from breast milk or formula is generally complete by around 12 months, although such practices are culturally determined; medically, weaning at 12 months is appropriate. Children will generally self-select foods that meet micronutrient requirements when provided with an array of healthy food choices. This practice is to be encouraged.

Children with access to an adequate diet reliably meet their energy needs, although energy intake may vary considerably by meal and even day. Parents should be reassured in this regard and discouraged from placing too great emphasis on "plate cleaning." Whether or not such

**Nutrition During Early Childhood, Table 4** Composition of commonly available commercial formulas compared to that of breast milk

Nutrient (quantity per liter)	Human milk	Similac (Ross)	Enfamil (Mead Johnson)	ProSobee <sup>a</sup> (Mead Johnson)	Isomil <sup>a</sup> (Ross)
Energy (kcal)	680	676	680	660	660
Protein (g)	10.5	14.5	14.2	19.7	16.1
Fat (g)	39	36.5	35.8	34.8	35.8
% polyunsaturated	14.2	37	29	18.8	23.5
% monounsaturated	41.6	17	16	37.6	38.3
% saturated	44.2	46	55	42.5	32.7
Carbohydrate (g)	72	72.3	73.7	65.6	67.6
Calcium (mg)	280	492	528	690	690
Phosphorous (mg)	140	380	358	540	490
Magnesium (mg)	35	41	54	70	50
Iron (mg)	0.3	12.2	12.2	11.8	11.8
Zinc (mg)	1.2	5.1	6.8	7.9	4.9
Manganese (µg)	6	34	101	NA	160
Copper (µg)	252	610	507	490	490
Iodine (µg)	110	95	68	NA	NA
Sodium (mg)	179.4	184	184	240	290
Potassium (mg)	526.5	706	729	790	710
Vitamin A (µg)	675	676	630	590	590
Vitamin D (µg)	0.5	10	10.8	NA	NA
Vitamin E (IU)	4	20	13.6	9.7	13.2
Vitamin K (µg)	2.1	54	54	NA	NA
Thiamin (µg)	210	680	541	530	390
Riboflavin (µg)	350	1,010	947	590	590
Pyridoxine (µg)	205	410	406	NA	NA
Vitamin B12 (µg)	0.5	1.7	2.0	2.0	3
Niacin (mg)	1.5	7.1	6.8	6.6	8.9
Folate (µg)	50	100	108	110	100
Pantothenic acid (mg)	1.8	3	3.4	NA	4.9
Vitamin C (mg)	40	60	81.2	79	59
Biotin (µg)	4	30	20.3	NA	NA

Adapted by author, 2012

Values in the table are derived from Kleinman (1998); and U.S. Department of Agriculture (n.d.)

NA not available in the sources used

<sup>a</sup>Soy-based formulas

a practice contributes to later obesity is unknown, but an association is plausible.

There is evidence that adult dietary recommendations are safe and reasonable for children beginning at age 2 years. This provides the added benefit of unifying family dietary practices earlier. There is evidence that dietary preferences established in childhood tend to persist, highlighting the importance of establishing a prudent dietary pattern early. Therefore, the

diet that should be advocated to adults and older children to promote health may be provided promptly, or approximated gradually, in children beginning at age 2 years. When plausible, regular consumption of fish should be encouraged. The consistent intake of DHA may offer considerable health benefits, supported by preliminary, but accumulating, evidence.

With regard to the prevention of overnutrition and its consequences among children in the

industrialized world, there is support for the promotion of breastfeeding for 6–12 months as appropriate and for efforts to promote physical activity. There is increasing emphasis on the quality of the maternal diet and on maternal weight management. Increasingly, and appropriately, attention is turning to modification of a “toxic” nutritional environment, in which young children are exposed and acclimated to a dietary pattern linked to a host of chronic diseases in adulthood. The combination of improved nutrition education and modification of the environment to support improved dietary and activity patterns offers promise for the future.

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## Nutrition During Childhood

David L. Katz<sup>1</sup>, Valentina Vinante<sup>2</sup> and Kimberly Doughty<sup>1</sup>

<sup>1</sup>Yale-Griffin Prevention Research Center, Derby, CT, USA

<sup>2</sup>Department of Public Health, University of Florence, Florence, Italy

### Introduction

Nutritional status between the ages of 5 and 12 years is strongly associated with physical and cognitive development. The primary prevention of both short-term developmental delays and long-term sequelae of over- and undernutrition is possible with optimal nutritional patterns during this period.

### Definitions and Scope

#### Definition of Terms

Malnutrition, the inadequacy of micronutrients, macronutrients, or both, takes many forms. *Macronutrients* are the three major classes from which nutrient energy is derived: carbohydrate, fat, and protein. *Micronutrients* are the myriad organic and inorganic constituents of food that play a role, essential or otherwise, in metabolism. *Xerophthalmia* is a scarring of the eyes induced by inadequate intake of vitamin A; the condition can lead to blindness. While also a form of adverse dietary exposure, *overnutrition* tends to be defined independently of malnutrition. In general, the term refers to intake of macronutrients and energy. Overnutrition is associated with the development of *overweight* (more than 10 % above ideal weight for height) and *obesity* (more than 20 % above ideal weight for height).

#### Scope of Poor Nutrition Among Children

More than one-third of children worldwide are malnourished and 43 % stunted in their growth as

a result (World Hunger Education Service, 2012). In industrialized countries, children are more often subject to overnutrition than deficiency. The prevalence of overweight among children in the USA varies with the definition applied but has certainly been rising for decades (Ogden, Carroll, & Flegal, 2008) with some recent evidence of a plateau (Centers for Disease Control, 2010).

The costs of suboptimal nutrition during this period are uncertain. The direct consequences of severe malnutrition, such as xerophthalmia, marasmus and kwashiorkor, are more readily measured than are potential long-term subtle cognitive deficits resulting from mild-moderate malnutrition or micronutrient deficiencies. Similarly, the costs associated with chronic disease, including cancer, referable in part to childhood dietary patterns, are perhaps impossible to measure due to the multitude of interposing variables. Perhaps the best estimates of the impact of nutrition during this period of life on society are cast in terms of simple assumptions rather than dollars. One may assume, as the evidence suggests, that diets established in childhood have long-term health effects either directly or because of their tendency to track into adulthood. One may also assume, as is often done in transcultural analyses, that all cultures/societies (barring specific genetic predispositions to disease) could achieve or approach the lowest rate for any particular disease seen among the populations of the world by adopting the pertinent salutary behaviors and/or environmental conditions. Under the constraints of such supposition, improvements in childhood nutrition could reasonably be projected to reduce dramatically the incidence of many infectious diseases, blindness, skeletal deformity, obesity, diabetes, cardiovascular disease, and cancer, to name only a few of the more evident physiologic benefits. Improved nutrition in developing countries could also have potentially far-reaching positive ramifications by increasing the physical and mental capacities of the individuals living there. The financial implications of such projections are truly incalculable.



## Theories

The link between nutrition and healthy childhood development is sufficiently self-evident as to be largely atheoretical. Theoretical aspects of childhood nutrition thus relate less to the nature of existing problems and more to the interventions best suited to their resolution. With regard to undernutrition, there is little debate that both physical and cognitive development is threatened when nutrient intake is grossly inadequate.

It appears that malnutrition earlier in life (less than 2 years of age) is more deleterious, but there is unlikely to be a sharp age cutoff, and longer periods of malnutrition later in childhood may have equally deleterious effects. The human brain is, however, remarkably resilient, and given enough nutrition and psychosocial stimulation, children appear to be able to essentially completely recover both in growth and cognitive development (Lifshitz, 2009). Thus, the degree of malnutrition, the duration, the timing, and the quality of the subsequent environment all interact in complex ways that are not yet fully elucidated, to determine the long-term mental and physical outcomes of children who have been malnourished.

A wide array of theoretical considerations also relates to the control of overnutrition in childhood and is the issue which is more likely to be encountered in the developed world. The determination and alteration of dietary preferences and patterns are informed by several related theories. Social scientists contend that dietary preferences derive in part from familiarity and are reinforced by it. Factors underlying the selection of a particular diet, and thus its becoming familiar, include palatability, accessibility, convenience, and cost. These factors influence adult selection, which in turn influences childhood exposure. Taste preferences in childhood are apparently the product of both nature and nurture. A preference for sugar in the diet is innate, while other taste preferences are more likely to be acquired. Diets high in fat or salt, for example, may tend to reinforce themselves. Children apparently tend to prefer diets similar to their earliest exposures, including the maternal diet during pregnancy and lactation.

Childhood overweight and obesity is often conceptualized using one of several variations of a social ecological model. One such model, ecological systems theory (EST), emphasizes the importance of context in human development (Davison & Birch, 2001). The contexts that are important to child development include, from most to least immediate: the family, school, community, and society. Individual child characteristics, such as age and gender, interact with characteristics within the other contexts to influence children's weight status. Research based on EST acknowledges the multiple levels of influence in the environment. An adaptation of EST that emphasizes the specific contextual factors influencing behaviors within the family is the family ecological model (Davison, Jurkowski, & Lawson, 2012). This model may be particularly useful for research focused on parenting and family characteristics.

Social cognitive theory (SCT) is one of the most popular theories serving as a basis for childhood obesity interventions. The theory is predicated on the idea that there are reciprocal interactions among the individual, the environment (including the social environment), and behavior (Bandura, 1986). According to SCT, the major determinants of health behavior are knowledge, perceived self-efficacy, outcome expectations (physical, social, and self-evaluative), goals, perceived facilitators, and social and structural impediments (Bandura, 2004).

There is increasing support for the consideration of evolutionary biology in efforts at modifying children's diets. While there are substantial uncertainties regarding human ancestry, and even greater uncertainties regarding particular behaviors, including dietary behaviors, of paleolithic humans, there is sufficient anthropologic consensus to support a model. This model may be of use in explaining the basis for dietary tendencies and preferences in children and thus in suggesting means of promoting more judicious diets when such are indicated.

## Current Research

Strategies directed at the control of overnutrition in childhood are comparable to those for adults.

The maintenance of near-ideal weight for height is considered desirable. There is general consensus that adipocyte number influences susceptibility to obesity and capacity for obesity control. Variation in weight in adults is more related to adipocyte size than number (adipocyte hypertrophy), while children are vulnerable to adipocyte proliferation (hyperplasia). Thus, the control of adiposity in childhood is thought to portend future weight control.

Regular physical activity in childhood is thought to be protective against obesity. Television viewing and other sedentary activities such as computer use are thought to contribute to obesity risk. Dietary fat restriction is thought to help control weight in children as in adults, as is compliance with guidelines for intake of fruits and vegetables. Practical strategies for achieving adherence to guidelines at the population level are lacking to date. In addition, there is increasing interest in the role of specific fatty acid classes in human health. N-3 fatty acid intake in childhood may be of particular importance to cognitive development, atopy, and immune function.

In the USA, dietary guidelines for the general population pertain beginning at or around age 2; a transition from breast milk to a variety of nutritious foods is advised starting at 6–12 months of age and extending through the first year of life (Gidding et al., 2006; U.S. Department of Agriculture [USDA], 2010).

The prudence of advocating the same diet for adults and children has been challenged, based largely on the lack of evidence that dietary restrictions in childhood prevent chronic disease in adults (Olson, 2000). However, obtaining evidence that dietary interventions in early childhood prevent chronic disease in late adulthood is a daunting challenge. Indirect, epidemiologic, and inferential evidence may be the best guidance available. The safety of the AHA Step 1 diet for children over the age of 2 has received fairly widespread support (Van Horn, Obarzanek, Friedman, Gernhofer, & Barton, 2005). A working group in Canada involving the Canadian Paediatric Society, Dietitians of Canada, and Health Canada has issued similar guidance (Health Canada, 2005). Proponents of dietary

fat restriction beginning at age 2 cite evidence that atherosclerosis begins in childhood and that a diet with not more than 30 % of calories from fat beginning at age 2 is compatible with optimal growth. Attention is increasingly directed to the quality of dietary fat rather than the quantity as a priority in childhood as well as adulthood (Barlow, 2007; Spear et al., 2007).

National surveys in the USA have revealed excessive intake of saturated fat in children over the age of 1 year (Kimm, Gergen, Malloy, Dresser, & Carroll, 1990). Niinikoski and colleagues studied over 500 7-month-olds assigned to a dietary counseling intervention aimed at reducing fat intake and promoting compliance with adult dietary guidelines or to a control group. At 3 years, cholesterol was lower in the intervention subjects (significantly in males, not significantly in females) than the controls, with no discernible differences in height, weight, or rate of growth (Niinikoski et al., 1997). Of note is that growth was preserved despite a decline in energy intake associated with the intervention. While the debate in the USA and Canada has focused on the safety of restricting dietary fat after age 2, this study would suggest that such an intervention may be safe at even a much earlier age (Niinikoski et al., 1996). These findings have been confirmed by the Turku Coronary Risk Factor Intervention Project for Babies (STRIP). The study has shown that repeated, individualized counseling in early childhood aimed at reducing consumption of saturated fat and cholesterol was effective and feasible and did not restrict growth in circumstances in which children were regularly monitored (Simell et al., 2000).

Thus, there is increasing evidence that efforts to modify the diets of children to reduce long-term cardiovascular risk are likely to be safe. Whether or not such diets do reduce long-term risk is less clear. Obviously, evidence of long-term outcome effects is difficult to obtain. To be considered in the debate is the importance of providing a single, consistent, dietary pattern for a family, as well as the issue of dietary patterns tracking over time. Data from the Bogalusa Heart Study demonstrate that there is tracking, between the ages of 6 months and 4 years, of both dietary pattern and cardiovascular

risk factors (Nicklas et al., 1988). In light of these considerations, it appears that the recommendation in the USA to advocate a similar diet for everyone over the age of 2 years is reasonable and safe and may offer long-term benefits. Conclusive evidence of benefit from early dietary modification efforts will accrue very slowly (Table 1).

Even in the midst of overall nutritional excess, there is some threat of nutrient deficiencies, incipient or overt, in children living in industrialized nations. Long-chain n-3 polyunsaturated fatty acids are particularly concentrated in the brain and retina. Docosahexaenoic acid (DHA) in particular is considered essential to healthy brain development. Although the essential fatty acid,  $\alpha$ -linolenic acid, is a precursor to DHA as well as eicosapentaenoic acid (EPA), conversion to DHA in particular appears to be limited and variable; the putative benefits of DHA apparently require that it be administered directly in the diet (Brenna, Salem, Sinclair, & Cunnane, 2009; Gerster, 1998). While health benefits of DHA supplementation are likely on the basis of confluent lines of evidence, they are as yet not conclusively proved. There is evidence of widespread nominality, if not deficiency, of zinc in both adults and children, and that supplementation may enhance immune function (Tomkins, 2000; Wintergerst, Maggini, & Hornig, 2007). Girls are particularly subject to inadequate calcium metabolism and its long-term sequelae, a susceptibility greatly compounded if low levels of body fat induce amenorrhea; calcium supplementation may be indicated. Other nutrients likely to be consumed at less than optimal levels in this age group include B vitamins (particularly folate), vitamin A, and possibly vitamin D; multi-vitamin/mineral supplementation is a not unreasonable practice, although lacking substantiating evidence.

Indigent populations in industrialized nations, and general populations in developing nations, are susceptible to malnutrition and nutritional deficiency states. Children susceptible to malnutrition benefit from the provision of a diet providing variety, and in particular, animal fat and protein. Micronutrient supplements are generally appropriate, especially of vitamin A to protect

against xerophthalmia, vitamin D where sun exposure is limited, and certain minerals. For example, nominal zinc deficiency may be fairly widespread, even in developed countries as noted above, and zinc supplementation may enhance immune function in children (Imdad & Bhutta, 2011; Tomkins, 2000). Iron deficiency contributes to both cognitive impairment and anemia and is very common in developing nations; supplementation in children is appropriate. The threshold relationship between malnutrition and cognitive development (e.g., IQ, communication skills, social skills, fine and gross motor skills) remains to be fully elucidated.

## **Part II. Prevention/Promotion Strategies Related to the Topic**

### **Strategies That Work**

The recommended diet for adults and children over the age of 2 is schematically represented in the USA by MyPlate (U.S. Department of Agriculture, 2011). The guidance emphasizes plant foods, allocating the majority of space on the plate to vegetables, fruits, and whole grains. Additional recommendations include the restriction of added sugar and refined starches; an emphasis on lean protein sources; and the inclusion of low- and nonfat dairy products. These guidelines are strongly supported by extensive literature.

Long-term weight losses are achieved more successfully in children than in adults. Evidence supports the inclusion of dietary change, behavior modification, parental involvement, and follow-up in a pediatric obesity program. Programs have emphasized both reduction in sedentary behaviors and dietary modification. Childhood food preferences are greatly influenced by parents' food choices and eating habits; therefore, family-based approaches are encouraged. While clear evidence of effective strategies to prevent or reverse childhood overweight and obesity is scant, there is support for the promotion of breastfeeding until age 1, restriction of television viewing, encouraging or

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**Table 1** Recommended nutrient intake in children age 4–8 expressed as recommended dietary allowance (RDA) or adequate intake (AI)

Nutrient	Daily intake
Protein	24 gm
Vitamin A <sup>a</sup>	400 µg RE
Vitamin D <sup>b,c</sup>	15 µg
Vitamin E <sup>d</sup>	7 mg α-TE
Vitamin K	55 µg
Vitamin C	25 mg
Thiamin	0.6 mg
Riboflavin	0.6 mg
Niacin <sup>e</sup>	8 mg NE
Vitamin B6	0.6 mg
Folate <sup>f</sup>	200 µg
Vitamin B12	1.2 µg
Calcium	1,000 mg
Phosphorous	500 mg
Magnesium	130 mg
Iron	10 mg
Zinc	5 mg
Iodine	90 µg
Selenium	30 µg
Biotin	12 µg
Pantothenic acid	3 mg
Copper	440 µg
Manganese	1.5 mg
Fluoride	1.0 mg
Chromium	15 µg
Molybdenum	22 µg

Sources: Dietary Reference Intakes for Calcium, Phosphorous, Magnesium, Vitamin D, and Fluoride (1997); Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline (1998); Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids (2000); Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Vanadium, and Zinc (2001); Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate (2005); and Dietary Reference Intakes for Calcium and Vitamin D (2011). These reports may be accessed via [www.nap.edu](http://www.nap.edu)

<sup>a</sup>As retinol activity equivalents (RAEs). 1 RAE = 1 mg retinol, 12 mg **b**-carotene, 24 mg **a**-carotene, or 24 mg **b**-cryptoxanthin. The RAE for dietary provitamin A carotenoids is twofold greater than retinol equivalents(RE), whereas the RAE for preformed vitamin A is the same as RE

<sup>b</sup>As cholecalciferol. 1 µg cholecalciferol = 40 IU vitamin D

<sup>c</sup>Under the assumption of minimal sunlight

<sup>d</sup>As **a**-tocopherol. **a**-Tocopherol includes **RRR**-**a**-tocopherol, the only form of **a**-tocopherol that occurs naturally in foods, and the **2R**-stereoisomeric forms of **a**-tocopherol (**RRR**, **RSR**, **RRS**, and **RSS**-**a**-tocopherol) that occur in fortified foods and supplements. It does not include the **2S**-stereoisomeric forms of **a**-tocopherol (**SRR**, **SSR**, **SRS**, and **SSS**-**a**-tocopherol), also found in fortified foods and supplements

<sup>e</sup>As niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE)

<sup>f</sup>As dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folic acid from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach

requiring (in school) regular physical activity, and providing a diet at home and in school that corresponds with guidelines (Centers for Disease Control, 2011; U.S. Department of Health and Human Services, 2011).

In developing nations and among the indigent in industrialized nations, strategies for the prevention or amelioration of malnutrition vary with culture and environment. In urban areas, access to food may be limited by purchasing power but not distance; subsidy and aid programs for families such as food subsidies or food drives have been shown to be helpful in the USA (Epstein, Dearing, Roba, & Finkelstein, 2010; Kim & Kawachi, 2006; Rose, 1999). In rural areas both in developed and developing nations, adequate distribution of existing food stores may be more limiting than cost. Access to food with high nutrient contents, such as fresh produce or in some areas meat protein, may be precluded by poor distribution, the expense of travel, or inconvenience. Some supplementation programs, such as the provision of vitamin A by WHO, are well established and have been shown to be beneficial.

### Strategies That May Work

Micronutrient supplementation with a multivitamin/mineral tailored for children is a reasonable practice, although definitive evidence of long-term benefit is lacking. Regular consumption of fish should be encouraged in nonvegetarians; the consistent intake of DHA may offer considerable health benefits, supported by preliminary, but accumulating, evidence. Parents should avoid overly restrictive or coercive feeding practices, as these have been associated with overeating and weight gain (Birch & Ventura, 2009).

The single most important principle in dietary health promotion is that a single diet is appropriate for the prevention of most diseases. Children at eventual risk of cardiovascular disease may be at risk of diabetes, cerebrovascular disease, hypertension, renal insufficiency, and cancer and are constantly vulnerable to infectious disease. If each disease required a different diet, consistent recommendations could not be made

to an individual, let alone a population. The emergence of a “one diet” approach to nutritional health is a logical outgrowth of confluent lines of evidence and the clinical and public health imperative for consistent and practicable advice. That families tend to eat at least some meals together argues for dietary recommendations for adults and children that are comparable, if not identical. The benefits of a health-promoting diet should be combined with regular physical activity for maximal benefit; a sedentary lifestyle may undermine many of the potential health benefits of an otherwise salutary dietary pattern in childhood.

While a balanced diet provides the needed micronutrients, many children and adolescents do not meet this goal and consume processed and fast foods in excess and consequently excess sugar, salt, and fat. A multivitamin/mineral supplement is an appropriate recommendation, although clearly not compensatory for an imprudent dietary pattern. Evidence of health benefits of multivitamin/mineral supplements is lacking at the population level, but supplement use has been associated with reduced prevalence of inadequate intakes of some nutrients, particularly in older children (ages 9–18) (Bailey, Fulgoni, Keast, Lentino, & Dwyer, 2012). However, supplement use has also been associated with intakes above the tolerable upper intake level (UL) for iron, zinc, vitamin A, and folic acid in all age groups and for vitamin C, selenium, and copper in 2–8-year-olds (Table 2).

Methods to achieve widespread compliance with recommendations for dietary and physical activity patterns in children remain speculative for the most part; limited success has been achieved. Among the practices that warrant both further study and on the basis of such evidence as has been gathered, current applications are distribution of food, and in particular, food sources of protein of high biologic value, to displaced children and families; widespread use of multivitamin/mineral supplements in both industrialized and developing nations; the provision of school food choices that reflect nutrition guidelines; and the promotion, both in school and at home, of regular physical activity in children.

### Nutrition During Childhood,

**Table 2** Recommended dietary allowances (RDAs) and adequate intake (AI) levels in early adolescence

Nutrient	Ages 9–13	
	Female	Male
<b>Protein</b>	34 gm	34 gm
<b>Vitamin A<sup>a</sup></b>	600 µg RE	600 µg RE
<b>Vitamin D<sup>b,c</sup></b>	15 µg	15 µg
<b>Vitamin E<sup>d</sup></b>	11 mg α-TE	11 mg α-TE
<b>Vitamin K</b>	60 µg	60 µg
<b>Vitamin C</b>	45 mg	45 mg
<b>Thiamin</b>	0.9 mg	0.9 mg
<b>Riboflavin</b>	0.9 mg	0.9 mg
<b>Niacin<sup>e</sup></b>	12 mg NE	12 mg NE
<b>Vitamin B6</b>	1.0 mg	1.0 mg
<b>Folate<sup>f</sup></b>	300 µg	300 µg
<b>Vitamin B12</b>	1.8 µg	1.8 µg
<b>Calcium</b>	1,300 mg	1,300 mg
<b>Phosphorous</b>	1,250 mg	1,250 mg
<b>Magnesium</b>	240 mg	240 mg
<b>Iron</b>	8 mg	8 mg
<b>Zinc</b>	8 mg	8 mg
<b>Iodine</b>	120 µg	120 µg
<b>Selenium</b>	40 µg	40 µg

Sources: Dietary Reference Intakes for Calcium, Phosphorous, Magnesium, Vitamin D, and Fluoride (1997); Dietary Reference Intakes for Thiamin, Riboflavin, Niacin, Vitamin B6, Folate, Vitamin B12, Pantothenic Acid, Biotin, and Choline (1998); Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids (2000); Dietary Reference Intakes for Vitamin A, Vitamin K, Arsenic, Boron, Chromium, Copper, Iodine, Iron, Manganese, Molybdenum, Nickel, Silicon, Vanadium, and Zinc (2001); Dietary Reference Intakes for Water, Potassium, Sodium, Chloride, and Sulfate (2005); and Dietary Reference Intakes for Calcium and Vitamin D (2011). These reports may be accessed via [www.nap.edu](http://www.nap.edu)

<sup>a</sup>As retinol activity equivalents (RAEs). 1 RAE = 1 mg retinol, 12 mg **b**-carotene, 24 mg **a**-carotene, or 24 mg **b**-cryptoxanthin. The RAE for dietary provitamin A carotenoids is twofold greater than retinol equivalents(RE), whereas the RAE for preformed vitamin A is the same as RE

<sup>b</sup>As cholecalciferol. 1 µg cholecalciferol = 40 IU vitamin D

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<sup>d</sup>As **a**-tocopherol. **a**-Tocopherol includes **RRR**-**a**-tocopherol, the only form of **a**-tocopherol that occurs naturally in foods, and the **2R**-stereoisomeric forms of **a**-tocopherol (**RRR**, **RSR**, **RRS**, and **RSS**-**a**-tocopherol) that occur in fortified foods and supplements. It does not include the **2S**-stereoisomeric forms of **a**-tocopherol (**SRR**, **SSR**, **SRS**, and **SSS**-**a**-tocopherol), also found in fortified foods and supplements

<sup>e</sup>As niacin equivalents (NE). 1 mg of niacin = 60 mg of tryptophan; 0–6 months = preformed niacin (not NE)

<sup>f</sup>As dietary folate equivalents (DFE). 1 DFE = 1 µg food folate = 0.6 µg of folic acid from fortified food or as a supplement consumed with food = 0.5 µg of a supplement taken on an empty stomach

### Strategies That Do Not Work

The obstacles to combating under- and overnutrition effectively are generally quite distinct. Among undernourished children, especially among members of a displaced population, barriers to optimal nutrition are more likely to be

environmental and political than either cultural or behavioral. In such populations, food distribution programs may or may not achieve their goals depending on how distribution channels are controlled. Problems of sanitation or facilities for storage may also compromise the effectiveness



of a well-intended program. Nonetheless, so long as children and adults are subject to social upheavals and poverty, such programs are clearly indicated, with every effort made to ensure that food is both culturally appropriate (e.g., no meat is provided to a vegetarian culture) and delivered to its intended recipients.

Barriers to the prevention of overnutrition represent a constellation of environmental, sociocultural, and behavioral factors. The environment in developed countries provides convenient access to energy-dense, nutrient-dilute food, and technology that largely obviates the need for physical activity and even lures children from physically active pursuits (e.g., video games). This is compounded by a food industry that spends large sums on advertising directed at children. Schools often enter into financial relationships with food or beverage distributors and, as a result, do not practice the nutrition that is preached to the children. Physical activity is increasingly deemphasized in schools, and as there has been little improvement in the rate of physical activity among adults in the USA over the past decade, few adults set an example in this regard worthy of emulation. Efforts to promote salubrious diet and activity patterns in children in such an environment are largely ineffective. Given the worsening epidemic of obesity and diabetes among children as well as adults in the USA, one may conclude, without undue pessimism, that virtually nothing being done to combat overnutrition and underactivity to date is effective at the population level. However, the failure of efforts to promote individual behavior change against the resistance of environmental factors is generating increasing attention to social and environmental determinants of dietary patterns that offers promise for the future.

## Summary

There are two principal considerations in determining best strategies to promote optimal nutrition among the world's children. The first is what the dietary pattern should be, and the second is to ensure that it is adopted.

With regard to the first consideration, confluent lines of evidence are increasingly compelling with regard to a dietary pattern, or range of patterns, associated with optimal health outcomes. The utility of the paleolithic model is enhanced because of the degree to which best estimates of our ancestral dietary patterns correspond with the best available science. Estimates of paleolithic intake suggest that we are adapted to a fat intake of approximately 25 % of total calories (Konner & Eaton, 2010). Further, our ancestral intake of trans fat was negligible, and saturated fatty acid intake is thought to have made up less than 5 % of total calories. Nearly half of the fat in our "natural" diets derived from polyunsaturated fat, with an n-3 to n-6 ratio of between 1:1 and 1:4. The other half derived from monounsaturated fat. The inclusion of adequate n-3 fatty acids in the diet may be particularly important during childhood.

On the basis, therefore, of both evidence and theory, a recommendation may be made, to children and adults, to consume approximately 25 % of total calories as fat, in a nearly even distribution between poly- and monounsaturated fatty acids. The combination of trans and saturated fat should be kept below 5 % of total calories. This can be achieved in part by following the consensus recommendations captured in MyPlate (U.S. Department of Agriculture, 2011) emphasizing intake of whole grains, vegetables, and fruit. However, unless fish consumption is very consistent, n-3 fatty acid intake is apt to be lower than optimal given the near-complete elimination of n-3 fatty acids from the flesh of domestic food animals. Consumption of soybeans and seeds, in particular flaxseeds, as a means of raising n-3 fatty acid intake is recommended. Regular physical activity among children should of course be encouraged.

The second consideration, the means to achieving these goals, is considerably more intractable. For children subject to malnutrition, food subsidy programs are a transient, discontinuous, and incomplete solution. Social interventions directed at the sources of poverty and displacement, while beyond the scope of this entry, are clearly the definitive interventions

for malnutrition. For children subject to overnutrition, education about eating well in the midst of a toxic nutritional environment is a tepid and ineffective response. Dietary guidelines, not convenience or financial expediency, should be the basis for school nutrition programs and nutrition assistance programs. Physical activity should be promoted by schools both during and after hours. Nutrient-dense, energy-dilute foods should be made as available and appealing to children as fast food now is, although the political and financial opposition to such reforms may be insurmountable in the short term. Until or unless the political will is gathered to modify the toxic nutritional environment in which children are being raised, we may realistically expect that relatively few will know the benefits of truly optimal nutrition. If such diets can be widely achieved among the world's children, the benefits to long-term health are likely to be profound.

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## Obesity Prevention During Childhood

Karen M. Myrick  
Quinnipiac University School of Nursing,  
Hamden, CT, USA

### Introduction

Childhood obesity is a worldwide pandemic. Obesity has the propensity to increase the risk of type 2 diabetes, cardiovascular disease, and cancer; decrease quality of life; and limit musculoskeletal function (Lu et al., 2010). The prevention of childhood obesity has the potential to also prevent the comorbidities associated and to prevent progression to adult obesity and the comorbidities associated as well.

The prevalence of obesity among US adults (34 %) is twice that observed in children and translates into nearly 73 million adult men and women (Centers for Disease Control and Prevention [CDC], 2011). US adults weigh 24 lb more than they did in 1960 on average and are at increased risk for health conditions such as diabetes, cardiovascular disease, and certain cancers (CDC, 2011). The prevalence has remained mostly flat in the past decade, yet the costs associated with obesity have increased substantially during the same period (CDC). One study estimated that approximately 9 % of all medical costs in 2008 were obesity related and amounted to \$147 billion, compared with \$78.5 billion 10 years before (CDC).

The causation for the problem is difficult to narrow down, as it has been described as multifactorial, which then, in turn, makes the solution difficult. Likely causative factors include a genetic predisposition, a positive energy balance over the long term, and overnutrition coupled with increasingly sedentary lifestyles (Schwager, 2010; Veerman, Van Beeck, Barendregt, & Mackenbach, 2009; Xi et al., 2011).

### Definitions and Scope

Body mass index (BMI) is the standard technique for assessing overweight and obesity in pediatric patients as well as in adults. However, this method does not distinguish between fat and lean mass, and interpretation of BMI must account for the individual characteristics of the person (Freedman & Sherry, 2009). In children and adolescents, BMI varies significantly with age, and there is no single value that corresponds to overweight or obesity. The US Centers for Disease Control and Prevention (CDC) developed growth charts from nationally representative surveys conducted over the last three decades, which include sex-specific BMI-for-age growth curves for 2–19 years of age (CDC, 2011; Freedman & Sherry, 2009). According to the CDC guidelines, children with a BMI between the 85th and the 95th percentiles are considered overweight, and children with a BMI in the 95th percentile are defined as obese (CDC, 2011; Guo, Wu, Chumlea, & Roche, 2002; Schwager, 2010). The International Obesity Task Force (IOTF) uses sex-specific BMI cutoff values based on the standard deviation of nationally representative datasets from the United States, Great Britain, Brazil, the Netherlands, Singapore, and Hong Kong (CDC, 2011).

Childhood obesity affects approximately 12.5 million children and teens (17 % of that population) in the United States (CDC, 2011). Changes in obesity prevalence from the 1960s show a rapid increase in the 1980s and 1990s, when obesity prevalence among children and teens tripled, from nearly 5 % to approximately 15 %, and the rapid increase has plateaued in the last 10 years (CDC). Alarming, among the heaviest boys, a significant increase in obesity has been detected, with the heaviest getting even heavier (CDC). Substantial racial/ethnic disparities exist, with Hispanic boys and non-Hispanic black girls disproportionately affected by obesity. Also, older children and teens are more likely to be obese compared with preschoolers (CDC).

## Theories, Major Explanations

Theories regarding obesity range from frameworks that are grounded in the medical model, social cognitive model, family theory, and social ecological theory. Many feel that the problem stems as a multifaceted issue, with medical, social cognitive, and family all being contributory.

### Biological and Genetic Factors and Theories

The obesity epidemic is thought to be caused by a combination of genetic predisposition to increased adiposity and body mass and long-term positive energy balance caused by over nutrition and a sedentary lifestyle (Schwager, 2010; Veerman, Van Beeck, Barendregt, & Mackenbach, 2009; Xi et al., 2011). Television advertising and time spent viewing have been viewed as an issue as well. The recent rapid proliferation in the prevalence of obesity both in certain populations, such as the United States, and globally suggests the significance of nongenetic causes.

### Family Factors

The family has a large influence on nutrition and exercise. The risk for obesity and overweight increases due to both poor dietary habits and lack of physical activity (Schwager, 2010). These may both be suggested by the family theories and practices.

### Environmental, Social, and Community Factors and Theories

Environmental determinants of childhood obesity in the United States include shifts in food consumption, changes in physical activity levels, increasing levels of television viewing, and the subsequent inactivity and marketing of food to children (CDC, 2011; Many kids aware of CDC obesity campaign, 2004). Access to safe areas to play and participate in healthy activities decreases the likelihood of obesity (Evans, Christoffel, Necheles, Becker, & Snider, 2011).

## Current Research

Community social marketing campaigns, such as 5-4-3-2-1-Go!, have been utilized (Evans et al., 2011). The objectives were to determine effects of the 5-4-3-2-1 Go! community social marketing campaign on obesity risk factors. The methods used were to randomly assign 524 parents of 3–7-year-old children to receive 5-4-3-2-1 Go! counseling or not. Parents were surveyed about behaviors and perceptions of children's behaviors at baseline and at 1 year. A multivariable logistic regression for each outcome was calculated, and the results demonstrated that parents who received counseling consumed more fruits and vegetables at follow-up (OR 1.749, [95 % CI: 1.01–3.059]). Parental exposure to messaging at children's school events was associated with higher water consumption (6.879, [1.954–24.212]).

Breastfeeding promotion and support has been studied for reduction in childhood obesity. The CDC has a specific obesity initiative, and breastfeeding has been suggested as a means of child obesity prevention by the White House Task Force on childhood obesity (Grummer-Strawn, 2010).

Programs that increase the physical activity levels of children have demonstrated positive results. The ABC (Activity Bursts in the Classroom) for Fitness program evaluated the effects of a physical activity program in the elementary school classroom on health outcomes. The methods used were to use three schools in the Independence School District in Independence, Missouri, that were assigned to receive the ABC program and 2 comparable schools served as controls. The program, led by classroom teachers, provides multiple, brief, structured physical activity breaks throughout the day. The results demonstrated that physical fitness measures of upper-body strength, abdominal strength, and trunk extensor improved ( $P < .001$ ). Medication use for asthma ( $P = .03$ ), attention-deficit hyperactivity disorder ( $P = .07$ ), or either medication combined ( $P = .005$ ) decreased. The study demonstrated that the effects of the program on daily physical activity,

fitness, and measures of health are beneficial (Katz et al., 2010).

In another school intervention program, STOPP, Marcus et al. demonstrated a decrease in the prevalence of overweight and obesity and possibly an effect in the home, through improving healthy eating habits at school versus increasing physical activity (Marcus et al., 2009).

Programs using the primary care provider to identify and discuss the problem of obesity with patients when they were identified as empowered demonstrated a 63 % decrease in BMI, compared to control group who's BMI increased (Kwapiszewski & Lee Wallace, 2011).

Resistance training has been shown to increase lean body mass, decrease the percentage of body fat, and increase strength and power in children who are overweight and obese (McGuigan, Tatasciore, Newton, & Pettigrew, 2009).

Muckelbauer found that an interventional and educational program on promoting water consumption was effective in the prevention of obesity (Muckelbauer et al., 2009).

Community-based group interventions, such as "active8," have shown that it compares well to similar interventions; however, further studies are required to evaluate long-term efficacy, to eliminate the possible confounding effect of factors such as ethnicity and comorbidities, and to strengthen the quality of the evidence by the use a control group and randomization (Norton, Samani-Radia, & Van Tonder, 2011; Smpokos, Linardakis, Kogevinas, & Kafatos, 2010).

## Overview of Strategies

Strategies to prevent childhood obesity include social marketing campaigns. School-based education and intervention programs that focus on healthy eating and/or increasing physical activity have been attempted. The promotion of breastfeeding is an approach to the problem that has had impact even on the national level.

Approaches utilizing the primary care provider to identify and address the problem of overweight and hopefully prevent the extension

to obesity have been trialed. Programs that increase lean mass while decreasing body fat, such as resistance training programs, have been attempted.

Programs that work on increasing the consumption of water and other healthy foods as their strategy have been tried. The feasibility of an email campaign has been demonstrated.

## What Works

A search of the literature did not uncover the standards of an intervention that met 3 successful trials.

## What Is Promising

Community social marketing campaign on obesity risk factors, such as the 5-4-3-2-1 Go! program, demonstrated results that showed this is a promising intervention (Evans et al., 2011).

Programs such as the ABC program that increased physical activity demonstrated positive outcomes (Katz et al., 2010).

Breastfeeding promotion programs have also demonstrated promising effects and outcomes (Grummer-Strawn, 2010).

Primary care provider programs that identify and then deal with the obesity diagnosis have shown promise in treating overweight and possibly preventing obesity (Schwager, 2010).

## What Does Not Work

Wake studied the theory that short sleep duration may contribute to childhood obesity. Being that sleep could be amenable to intervention, sleep was thought to provide a potential path for prevention. The authors aimed to determine the impact of a behavioral intervention that successfully reduced parent-reported infant sleep problems on adiposity at age 6. The study failed to show an association with sleep and obesity (Wake, Price, Clifford, Ukoumunne, & Hiscock, 2011).



## Summary

Additional work might be done in the area of national campaigns which advertise during child and family programs. Work in decreasing the direct advertisement to children and promotion of healthy habits is promising. Providing safe environments where children can engage in physical activity daily is also encouraging.

The best practices are headed in a direction of problem identification and solid programs with education and intervention incorporated. Multifaceted programs that take genetics, environmental influences, and prevention into account will likely yield the best results.

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## Parenting as Primary Prevention

Donald G. Unger<sup>1</sup> and Amanda Rich<sup>2</sup>

<sup>1</sup>College of Education and Human Development,  
Department of Human Development &  
Family Studies, University of Delaware,  
Newark, DE, USA

<sup>2</sup>York College of Pennsylvania, York, PA, USA

### Introduction

While debates will inevitably continue into the next decades as to the relative influence of nature/biology versus environment on a child's development, research continues to support the finding that "parents matter." Prevention programs for parents focus on supporting all types of parents and children, ranging from universal programs for all to programs for populations of young children and their families who have specific, indicated risks or challenges. The primary goals of these prevention programs for parents of young children are to (a) enable parents to nurture and safely care for their young children; (b) help parents ensure that their young children will be academically, socially, and emotionally ready for success in school; and (c) promote the well-being and positive healthy development of children by strengthening families and their communities. By accomplishing these goals, it is expected that young children will eventually become productive and contributing members of their communities.

Unfortunately, however, there has never been a "how to parent" handbook that everyone agrees is the "right" way to be a parent and to deliver prevention programs. This is in part due to our increasingly diverse, global society and the vast variations in experiences of parenting. Being a parent today is a journey into the known and unanticipated, the private and public, the predictable and unforeseen. Parenting can bring both the young child and the adult into complex, dynamic, and new multidimensional relationships and challenges. Parenting may extend between a biological parent(s) and his or her child living

together and at times include other family members, friends, partners, and nonresidential fathers as caregivers. Parenting may even involve additional "created families" through foster care, adoption, and government involvement. Resources and challenges vary for parents and can come in the forms of developmental delays and early intervention programs, variations in parent work schedules, income, and the quality of childcare arrangements. Ethnic and racial disparities in resources, differences in gender roles and expectations, changes in sociopolitical and moral climates that affect funding for service provision, and traditions, values, and conflicts between generations, as well as between different countries of immigrant, global families affect the parenting experience. Many parents effectively navigate this complex environment for child-rearing, having access to sufficient social and community resources, along with the personal, family, and physical assets necessary to meet their children's needs. Other parents, however, face many obstacles associated with living in the contexts of limited economic, social, or community resources and/or are parenting children with complex needs, such as children with developmental disabilities, mental health concerns, and chronic health conditions. Still others struggle to maintain positive parent-child relationships under strained, separate living arrangements, whether due to war and military service, incarceration, drug and alcohol abuse treatment, divorce, or domestic violence. Parenting prevention programs have the challenge of meeting the wide-ranging needs of all parents and children in an increasingly diverse global society.

### Definitions and Scope

A parent in this entry is broadly defined, and this definition is intended to reflect the increasing diversity in families. Being a parent can include a biological relative (e.g., grandparent), nonrelative (e.g., foster parents), and/or nonresidential (e.g., divorced father) caregiver who assumes primary responsibility for carrying out one or more of the roles of caring for a young

child (prenatal – age 8). These roles include the following: (a) providing for the child's basic needs so that a child has adequate food, nutrition, health care, shelter, and clothing; (b) guiding a child's cognitive, physical, and social-emotional development by encouraging exploration, mentoring and modeling basic skills, celebrating developmental advances, rehearsing and extending new skills, comforting and communicating, and providing limits (Ramey & Ramey, 1998); (c) preventing psychological and physical neglect and abuse by providing adequate nurturance and supervision and engaging in actions to prevent accidents and related injuries; (d) ensuring quality early care and education in the home (preparing for school entry by providing learning opportunities for children) and/or school-/childcare setting (taking into account factors such as child to teacher ratios, teacher/caregiver behavior with children, parental school involvement); (e) advocating within the wider community on behalf of his or her child, e.g., to promote safe communities, good schools and recreational facilities, policies of inclusion, and acceptance of children with disabilities; and (f) balancing and attending to adult self-care strategies while at the same time caring for a young child in order to cope with and buffer parenting and relationship/marital stress, challenges to one's sense of efficacy and mastery and a sense of isolation when caring for an infant (Cochran & Niego, 1995). Lastly, these roles may change and vary over time, depending upon the needs of the child, parent(s), and family.

## Theories

Prevention programs for parents of young children are guided by many different theoretical frameworks. However, we believe that three frameworks, in particular, are relevant for addressing the needs of young children through parenting prevention programs. First, an ecological framework emphasizes that children's development has multiple, intertwining determinants (Bronfenbrenner, 1979). Child development occurs within a series of nested and overlapping

contextual subsystems in which the child interacts, either directly or indirectly, in a dynamic, bidirectional fashion that changes and develops over time. These systems include parents and families where there is typically the most direct or frequent contact, the child's and parent's genetic predispositions, early care and education settings, workplace and government policies that impact caregivers, as well as communities where a child lives and plays. An implication of an ecological approach to prevention is the need to address multiple levels and determinants of behavior, and that change can be brought about through change in interconnected systems.

Attachment theory focuses attention on the affective bond that typically develops between parent and child that endures across both time and context (Bowlby, 1988). Attachment theorists believe that the infant-caregiver relationship serves as a foundation for social-emotional development for a child. A secure infant-caregiver attachment eases a child's distress in novel situations, provides a secure base to explore new situations with confidence, and supports the overall confidence and self-efficacy of the developing child. When secure attachments to caregivers do not develop, children are more apt to display behavior that reflects distrust or uncertainty in the caregiver's responsiveness to the child's needs. An implication of this theory for prevention programs with young children is the importance of providing opportunities that promote parental understanding of their children's behavior and temperament. This understanding, along with the skills to adjust a parent's behavior to become more responsive to his or her child's needs and signals, can result in positive, reciprocal parent-child relationships, which in turn facilitate a child's feelings of attachment and well-being.

A social support or mutual aid framework is a cornerstone of most prevention programs. Social support refers to the emotional, informational, and material resources that are provided by a parent's informal social network and/or by others experiencing similar life circumstances and stressors. These informal resources are viewed as important and distinct from assistance

provided by professionals because they are typically offered in ways that are more flexible and timely and perceived as genuine, caring, and freely offered. Help in the form of informal social support can buffer stress, promote well-being, and facilitate resiliency to adverse circumstances. An implication of a social support and mutual aid framework is that parents often benefit from help that is locally based, culturally sensitive, and provided by other parents from similar life circumstances.

## Current Research

There is a growing body of research on parenting and risk and resilience in children that can inform prevention efforts (Whittaker, Harden, See, Meisch, & Westbrook, 2011). Parenting itself can be either a protective or risk factor for children. Sensitive, nurturing parenting is associated with positive physical, cognitive, and social-emotional outcomes in young children (Tamis-LeMonda, Briggs, McClowry, & Snow, 2009). There are both affective and behavioral components involved in positive parenting, including warmth and responsiveness to a child's needs and perspective, appropriate limit setting, and creating a predictable environment for the child. Sensitive, responsive parenting is thought to promote secure attachments between an infant and her caregiver. Secure attachment relationships may help regulate the neurological activity of stress-sensitive systems in the brain helping children develop better emotional regulation and self-soothing skills (Bernard & Dozier, 2010). Parents with fewer mental health problems, good general health, and healthy social support systems are more likely to engage in positive parenting (Whittaker et al., 2011).

When parents experience multiple risk factors and a pileup of stressors, parents themselves can be a source of risk for young children. Child abuse and neglect is a significant problem among families with young children and a major focus of many parenting prevention programs. In the United States in 2008, approximately 700,000 children were victims of maltreatment, 33 % of them being children under 5 years of age; the

majority of maltreatment cases are ones of neglect (U.S. Department of Health and Human Services, 2010). Parental risk factors include maternal age, family size and structure, poverty and related stressors, maternal health and substance abuse, lack of social support, domestic violence, lack of parenting efficacy, and challenging child health and behavior problems (Whittaker et al., 2011). Harsh, abusive, and/or neglectful parenting is associated with cognitive, behavioral, social, and emotional problems in children (Repetti, Taylor, & Seeman, 2002) that can persist even long after the maltreatment has ended (Currie & Widom, 2010).

Parenting may also mediate the impact of risk factors for negative outcomes in a child's life. Poverty remains a significant risk factor for children's development throughout the globe. In 2009, 20.7 % of children under the age of 18 were living in poverty in the United States (U.S. Census Bureau, 2010). Poverty is associated with wide-ranging negative outcomes for children (Raver, 2004). Prevention programs often focus on supporting parents in poverty to offset the potentially devastating consequences on children as well as the potential impact of poverty on parental depression, stress, family discord, and overall efficacy in parenting (Henderson, Sayger, & Horne, 2003).

Lastly, research increasingly documents the changing nature and diversity of families. For instance, more households than ever before in the United States are comprised of grandparents raising young children (Dolan, Casanueva, Smith, & Bradley, 2009). Prevention programs need to embrace such changes from a strengths perspective and find ways to support these new family structures. For instance, in comparison to foster care, kinship care provided by grandparents can provide greater stability and warm, positive parenting behaviors (Dolan et al., 2009). At the same time, grandparents cannot be expected to assume such responsibility without adequate supports, given that grandparents providing care are more likely to experience poverty, social isolation, and physical health problems than younger caregivers (Dolan et al.).

A greater number of openly gay men and women are becoming parents. Research shows

that children from gay and lesbian families have similar social-emotional, physical, and psychological development as children living with heterosexual couples (Patterson, 2006). However, gay and lesbian fathers and mothers may face additional challenges and stress due to social stigma and discriminatory legal policies. Many gay and lesbian parents even fear that disclosing their sexual identity may result in them losing custody of their children (Shapiro, Peterson, & Stewart, 2009). Gay parents may also face concerns that differ from heterosexual parents and by region of the world. For instance, lesbian mothers in the United States report having more anxiety regarding legal issues and discrimination based on sexual orientation than lesbian mothers in Canada where there is greater legal support for gay and lesbian parents (Shapiro et al., 2009).

Families with children with intellectual disabilities increasingly are enrolling their children in early care and education programs with typically developing peers. However, while they may have legal access, these parents still face significant challenges in ensuring quality, inclusive, and supportive caregiving environments. Prejudices, misinformation about intellectual disabilities among individuals with typically developing children and a lack of quality services and supports constrains opportunities for full inclusion. Moreover, these parents are at increased risk for stress, isolation, and depression (Glidden, Bamberger, Turek, & Hill, 2010). In addition to financial strain associated with meeting a young child's special needs, their children are more likely to experience challenging behaviors although few early care and education programs are prepared to help with these issues. Prevention programs have to address diversity not only among caregivers but also among their children. Knowing these challenges may help ensure that prevention programs are meeting the needs of all families.

## Overview of Strategies

There are essentially four strategies or approaches that are used to support parents in

engaging in positive parenting, for filling their parental roles and promoting positive outcomes for young children. They include (a) parent education, (b) family support, (c) family strengthening, and (d) family preservation.

In parent education, parents receive information about child development that they can use to engage in child centered activities to promote their children's development. Opportunities are provided to try out these different approaches to facilitating development. Parent education may also include a focus on parent-child relationships and parenting skills, as well as learning techniques for managing stressors that might affect their parenting.

A family support approach works on establishing relationships between parents and others to strengthen parents' abilities to draw upon available resources to enhance their well-being and that of their families. A family support approach is "holistic"; while child development information is often provided, additional forms of support that are associated with multiple spheres of the parent's and family's life are addressed as well. Helping parents develop long-term support systems, manage stress, access community resources, obtain employment, and strengthen the home-preschool link is an important aspect of family support. Family support interventions involve parents, volunteers, professionals, and paraprofessionals and offer numerous family services that build upon family and community strengths.

The family strengthening approach is very similar to family support but focuses specifically on enhancing key protective factors (i.e., parental resilience, social connections, knowledge of parenting and child development, concrete support, and social and emotional competence of children) with the explicit goal of preventing child abuse and neglect (Center for Study of Social Policy, 2007). This approach works toward helping existing community-based organizations such as early care and education programs to become more family centered and a broader source of support for parents.

Lastly, family preservation programs provide intensive clinical and concentrated short-term

support services to families who are at risk for out-of-home placements.

These strategies for supporting parents are quite diverse and consequently employ a number of different methods to implement their strategy. *Methods* used to implement a strategy are distinct from the *strategy* itself. For example, home visiting is a *method* that can be used to deliver a variety of strategies or approaches (e.g., parent education, family support, family preservation). For high-risk and teen parent families, combining intensive child-focused early intervention and center-based services, along with home visiting and other high-quality parent- and family-focused services, has a significant potential for improving child and family outcomes (Ramey et al., 2000). Another method of implementing family support is to explicitly offer services related to adult education and development, in addition to parenting. Some preschool programs, for instance, offer literacy training and general education for parents, becoming a “two-generation” program, based on the premise that children’s educational experience is closely tied to parent literacy (Smith & Zaslow, 1995). Similarly, programs may incorporate conflict resolution with their adult partners and relationship enhancement as part of their family support curriculum. Lastly, programs may incorporate group methods. Groups, conducted by parents and/or professionals, are organized around parent and/or child concerns (e.g., parents with children with cancer, teen parenting, adults transitioning to parenthood, parents in lesbian relationships). The support of group members can provide opportunities to learn from each other, reinforce and enhance parents’ competencies, and establish a nonthreatening environment to acquire new information (Rosenberg & Reppucci, 1990).

## What Works

There are several commonalities in how effective prevention programs for parents of young children are constructed and implemented, rather than any one most effective framework or method

(Borkowski & Weaver, 2006; Nation et al., 2003). Prevention programs that work are typically theoretically driven. Theories act like spotlights in prevention research, helping to identify which issues are of importance, how concepts may be connected to one another, how change comes about, and which issues are beyond the scope of the intervention. Effective prevention programs also tend to use a combination of interventions to address multiple components of a particular problem. Effective programs are delivered with sufficient dosage and with intensity that matches the need of the participants (Borkowski & Weaver, 2006). The most effective prevention programs are implemented before the onset of the problems and are initiated at periods of developmental transitions and/or new challenges and family stressors.

Four programs are highlighted here that have been found to yield positive outcomes and have many of the components of effective prevention: The Nurse-Family Partnership, Healthy Families America, Early Head Start, and Child/Parent Center programs. The Nurse-Family Partnership program utilizes professional public health nurses to go to the homes of expecting or new mothers, many of who have been identified as being at risk. The Nurse-Family Partnership program targets at-risk families, identified by socioeconomic status, geographic area, and maternal age. In the program, nurses work to educate parents on child development, support parents in involving friends and extended family to gain support for parents and children, as well as help families connect to appropriate services in the community. The goals of the Nurse-Family Partnership program are to improve the outcome of pregnancy, parental caregiving skills, and the mother’s overall life course development (Olds, 2006). The Nurse-Family Partnership program has been evaluated across diverse samples and regions in the United States, with findings of reductions in preterm births, in the percentage of low birth weight infants, in subsequent pregnancies and births, and in problems resulting from substance abuse (Olds et al., 2007).

Healthy Families America (HFA) is a national home visiting program that extends across the



first 5 years of a child's life (Prevent Child Abuse America, 2002). The goals of the program are to promote positive parent-child relationships, reduce child maltreatment, and promote positive child development (Prevent Child Abuse America). Healthy Families America is a more universally targeted program than most other home visiting programs. HFA reaches out to 90 % of all new or first-time parents within a particular community (Prevent Child Abuse America). There have been four randomized controlled trials of the HFA home visiting programs all of which have shown encouraging program impacts on child health, cognitive and socio-emotional developmental outcomes, but mixed results regarding effects of positive parenting in contrast to the prevention of abuse and neglect (Harding, Galano, Martin, Huntington, & Schellenbach, 2007).

Early Head Start, an expansion of the Head Start preschool program, includes low-income families with infants and toddlers (Raikes & Love, 2002). Early Head Start utilizes home visiting, center-based care, advocacy training, and a combination of these approaches to promote healthy child development and assist parents in developing positive child-rearing behaviors as well as promote community development (Raikes & Love). Early Head Start has been extensively evaluated and has been found to have positive results on parenting behavior and child development. In a recent evaluation, children at 14, 24, and 36 months of age in the Early Head Start group had larger vocabularies, higher scores on standardized developmental tests, and more positive social-emotional development than children in the control group. Measures of parenting behavior also showed to be more positive in the Early Head Start parents versus the control group. Parents were more knowledgeable about infant-toddler development, were more engaged in language and literacy activities, were less likely to have engaged in harsh parenting styles in the past week, and reported less marital conflict than did others in the control group (Ayoub, Vallotton, & Mastergeorge, 2011).

The Child/Parent Center program has been systematically evaluated and found to have

positive impacts on child development and family and community functioning (Reynolds & Ou, 2011). This program utilized a center-based approach to connect families of low-income preschool children with resources and offered intensive preschool services as well as a parent resource and educational center. Children and their families entered the program at age 3 and were followed into adulthood to evaluate any long-lasting impact of the program (Reynolds & Ou). Children demonstrated greater cognitive gains and had lower rates of special educational services in preschool. In kindergarten children in this group scored higher on reading and math scores and had fewer grade retentions and fewer rates of special education. Educational gains persisted until middle school. At 24 years of age, children in the experimental group demonstrated lower rates of incarceration, higher occupational prestige, and lower rates of depressive symptoms than children in the control group (Reynolds & Ou).

### What Is Promising?

Some promising practices that have not been extensively researched have come from programs that were originally designed for children with behavioral challenges and disabilities and then applied to families experiencing more general risk. Programs such as *The Incredible Years* (Webster-Stratton, 2007), while designed for parents of children with severe behavioral challenges, have been found to improve parent and child outcomes for children and families from a range of at-risk populations (Barth et al., 2005; Letarte, Normandeau, & Allard, 2010).

Programs targeted at promoting positive attachment behavior in young children who are at risk due to disruptions in their caregiving experience are also promising (Heinicke et al., 1999). Due to disruptions in caregiving experiences, or maltreatment, children who enter foster care, for instance, are more likely to have difficulty forming secure attachments than other children. Dozier et al. (2009) developed the Attachment and Biobehavioral Catch-up Intervention (ABC) for foster parents of young children, with the goal

of supporting the development of positive attachment behavior in the children. The ABC intervention consists of parent training for foster parents conducted by experienced social workers or psychologists. Foster parents learn to provide nurturing behavior even when the child does not elicit it and receive help in examining their own issues that interfere with providing nurturance and support to create a predictable environment that supports the child's self-regulatory behavior (Dozier et al.). In a randomized trial Dozier et al. found that foster parents who received the intervention reported their children demonstrated less avoidant and resistant behavior when distressed than parents in a control group, and the intervention had benefits on the child's functioning including behavioral and neurobiological regulation as well (Dozier et al., 2006).

Most of the evaluations on prevention programs have targeted families labeled as "at risk" rather than using a universal design. However, of the existing universal programs, there are some promising results. For instance, the Family Foundations Project is a transition to parenthood program for couples and focuses on the co-parenting relationship (Feinberg, Kan, & Goslin, 2009). The program consists of eight interactive psychoeducational, skill-based classes designed for expectant, cohabiting, or married couples. Effects have been documented on parental stress, efficacy, co-parenting, harsh parenting, children's emotional adjustment, and maternal depression among cohabitating couples when their children were 6 months and 3 years of age (Feinberg et al., 2009).

Other universal programs have utilized tiered, multiple interventions and had promising results. Triple P (Positive Parenting Program) follows a public health, population-based approach and has found positive results on reducing rates of child maltreatment in one randomized controlled study (Prinz & Sanders, 2007). The program uses five levels of intensity of programming. For instance, media is used along with mass mailings to reach families, educating them on typical child development and positive parenting practices. Another level consists of brief and flexible consultation to individual parents and parenting

seminars. The most intensive level includes 10 session programs with families, using a combination of skill training, home visits, clinic observations, practice, feedback, mood management, and stress and coping skills (Prinz & Sanders).

Parents as Teachers is designed as a universal prevention program using home-based and group methods but, because of funding constraints, often is provided only to parents who are determined to be "at risk." PAT begins with parents during pregnancy and throughout the child's early years. Parent educators use the PAT curriculum (Born to Learn, 2005) and receive ongoing training and certification. The goals of the program are to increase parents' knowledge of early childhood development, promote positive parenting behaviors, detect developmental delays and health problems in children, prevent child abuse, and promote school readiness (Parents as Teachers National Center [PATNC], 2005). Evaluations of the effectiveness of the program have been generally positive, with some mixed findings (Bryant et al., 2003). For instance, Drotar, Robinson, Jeavons, and Kirchner (2008) conducted a controlled, experimental design of the Parents as Teachers program and found significant effects on a child's mastery motivation, though there was no significant impact on a wide range of other developmental outcomes. A significant strength of PAT is its research-based curriculum that is routinely updated, and numerous opportunities for training are provided annually by the national PAT organization.

Other promising practices come from programs exploring creative ways to maneuver barriers to parent participation and subsequently reach diverse families. For instance, programs using Internet-based parent-to-parent and professional-to-parent support are being implemented for parents of young children with disabilities. This may be exceptionally helpful for reaching these families in rural areas. Programs are piloting child developmental milestone information, synced with the age of their young child, being sent to parents on their smartphones. Programs are even available online to help parents

become advocates for their children with disabilities and to learn how to join with policy makers to effect systems-level change, for instance, *Partners in Policy Making* (2010).

To ensure that an intervention “works,” attention must be addressed not only to intervention strategies and their outcomes but also to the process of how a program is implemented. In a qualitative process program evaluation with African-American mothers who participated in Parents as Teachers program (Parents as Teachers National Center, 2005), for example, there were distinct within group variations in mothers’ perceptions of the purpose, focus, and meaningfulness of their home visits, even though parent educators were all implementing the same PAT curriculum (Woolfolk & Unger, 2009). While much has been learned from outcome-focused program evaluations, there remains much to know about the nuances of recruiting parents, parent perceptions, and maintaining their involvement over the course of a prevention program.

Preliminary evidence suggests that programs are more likely to engage parents and develop trusting relationships when they address a range of parental emotional and developmental needs, based on positive, culturally competent approaches and trust. Among high-risk parents, the relationship between the parent and the service provider(s) is crucial to the success of the intervention. Needed are approaches that involve and collaborate with parents in choosing program design and content, build on parents’ strengths, and incorporate cultural beliefs and practices of parents. Early intervention programs for children with disabilities and children at risk for developmental delays, for example, have increasingly adopted a family-centered philosophy that addresses family needs and goals for the child and family, provides choices in services for parents, and promotes collaborative, trusting relationships between parents and professionals (Dunst, Trivette, & Deal, 1994).

Parent education and support services are more successful when offered in the context of family and community diversity. Multiple caregivers that include not only fathers and mothers

but also grandmothers, aunts, and other kin need to be recognized as important caregivers. Community-based programs must be “of” the community so that effective linkages with resources in the community can be made and community values and norms can be understood and respected by making variations in service delivery strategies.

Programs need to be flexible yet have a curriculum. Flexibility is needed to respond to family crises and stresses while at the same time having a curriculum; social support is not enough. Determining how to balance support services and program protocol is a constant challenge. Parents with multiple risk factors may need more intensive and comprehensive services. Curricula also need to be presented with methods that fit with parents’ learning styles. When printed material is used, the reading level must be geared to the audience. For audiences with limited literacy skills, videos can provide information and modeling with the added advantage of being available for repeat viewing.

Practical barriers to participation need to be addressed, such as time constraints and competing responsibilities. In populations with limited resources, providing transportation, child care, convenient times and locations, and meals or refreshments may improve retention. Fathers, in particular, might be recruited where they work or participate in recreational activities. Interested but very busy parents may gain as much from learn-at-home formats such as newsletters, which can be adapted to individual schedule needs and challenges. Incentives for continued participation – and rewards to celebrate milestones – may be effective, especially in populations with limited economic resources.

Promising programs ensure that staff have access to high-quality professional development, supervision, and training. Staff need significant training and ongoing supervision to help them sort out the complex issues they confront when working with families who are difficult to engage, to learn about culturally diverse families and parenting practices, as well as to deal with their own reactions to emotionally charged situations in their work with parents. One promising

approach to professional development that is cost-effective, flexible, and user-friendly is a Web-based training and certification program for early care and education providers to learn about parent-child interaction through the KIPS (Keys to Interactive Parenting Scale) (Comfort, Gordon, & Unger, 2006). Research has documented that practitioners from a variety of backgrounds can efficiently learn, through Web-based instruction, to use this valid and reliable evidenced-based assessment tool in their work with families.

Lastly, promising programs use program evaluation to guide program implementation, assess program fidelity, monitor the integrity of program implementation, identify and address barriers to implementation, identify areas in which additional training is needed, and determine what program modifications are needed. Program evaluation approaches such as empowerment and participatory program evaluation are particularly a good fit with the needs and conceptual frameworks of parenting prevention programs.

### What Does Not Work

Not all programs that are designed to support parents and promote positive child and family development effectively do so. Programs that do not address the complexity and diversity of families and communities are not likely to be effective. Prevention programs that do not foster a sense of trust and positive relationship between staff and parents due to lack of cultural relevance or poorly matching staff and parent personalities are also likely to fail. There have been mixed results among programs that utilize paraprofessionals, and this may be due to a lack of sufficient training of staff in certain programs and/or a lack of support from professionals with whom they are collaborating. Parent education programs that attempt to teach skills without allowing parents time for active practice or trying to teach skills that parents deem as irrelevant are not likely to result in a change in parent behavior. Programs that have insufficient dose or are inappropriately timed are also not likely to be successful. Prevention

programs are also challenged by high rates of dropout. In order for prevention programs that target parents to be effective, programs need to address practical barriers to participation such as time restraints and competing responsibilities.

### Summary

Parenting programs have developed in response to the changing needs of parents and families in a global society. The most effective prevention programs address multiple sources of risk as well as build upon family strengths. They utilize multiple teaching methods and work to build trusting positive relationships between all involved. In doing so, prevention programs support families of young children in achieving positive outcomes across multiple domains for both parents and children, and sometimes this even extends to positive community development.

There remains a need for ongoing process and outcome program evaluation for prevention programs targeting families of young children. Program evaluation is essential not only for monitoring the quality and challenges of program implementation but also to determine what types of interventions are most effective. Program evaluation can help determine the best fit between parents with varying needs and various programs. There continues to be a need for innovations in the development and implementation of prevention programs for families of young children that reflect and address the diversity of children, families, and their communities.

Research that reflects the complexity of the relationship between children, parents, and their communities will continue to help advance the science of prevention and lead to better supports for young children and their families.

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## Pediatric Preventive Medicine in Early Childhood

Jennifer B. Blau<sup>1</sup>, Gary M. Blau<sup>2</sup> and Okori T. Christopher<sup>3,4</sup>

<sup>1</sup>Inova Fairfax Hospital for Children, Falls Church, VA, USA

<sup>2</sup>Child, Adolescent and Family Branch, Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, Rockville, MD, USA

<sup>3</sup>American Institutes for Research, Washington, DC, USA

<sup>4</sup>Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, Rockville, MD, USA

### Introduction

Health promotion and disease prevention in the pediatric population became a focus of physicians in the early 1900s when 35 pediatricians met in response to a national calling for an independent pediatric forum to address children's health-care needs. The discussion during this meeting focused on attaining optimal physical, mental, and social health for infants, children, and adolescents. The outcome of these conversations became a national organization now known as the American Academy of Pediatrics (AAP). Since its inception in 1930, the AAP has expanded from 35 original members to over 60,000 members with 29 committees and 9 councils all aimed at promoting health and improving health care for children (American Academy of Pediatrics [AAP], 2011).

There is no question that the time to eliminate adult disability and mortality is during childhood and adolescence (Pratt & Tsitsika, 2007; Kvaavik, Klep, Tell, Meyer, & Batty, 2008). The role of the pediatrician and family practitioner is to encourage positive lifestyle choices to improve health status, prevent or minimize disease, and eliminate preventable causes of death. Currently, the most influential and successful health promotion and preventive medicine strategies for children are

the use of vaccinations, nutrition – inclusive of breast-feeding and a well-balanced pediatric diet – routine well-child examinations, anticipatory guidance to avoid future disorders and conditions, and the increasing understanding of how environmental, social, cognitive, genetic, and psychological factors influence the development of a child (National Research Council and Institute of Medicine, 2000).

### Definition and Scope

Health promotion is the use of strategies to help people make lifestyle choices that move them towards optimal health (Centers for Disease Control and Prevention [CDC], 2011b). Preventive health care is defined as stopping disease from developing or detecting illness or disease in the earliest stages. Primary care is term used to describe services provided by health-care professionals who specialize in first contact and continuing care for persons that have an undiagnosed symptom or health concern (AAP, 2011). Primary care providers include pediatricians, family physicians, and internists. Secondary care relates to treatment provided by specialists (e.g., coronary care), and tertiary care is the term used to describe treatment provided by highly trained specialists often using advanced technology. Preventive medicine can occur under all of these circumstances. For example, even when a child is sick or diagnosed with a disease, the goal of reclaiming health status, achieving optimal functioning, or avoiding other conditions is still appropriate.

Chronic conditions such as cardiovascular diseases, cancer, and chronic respiratory diseases will be the leading cause of death in 2020 (World Health Organization [WHO], 2002), and the majority of these diseases are caused by risk factors, often avoidable, that begin in childhood and adolescence. To address these risk factors, which are often referred to as negative determinants of health, there has been an increasing focus on health promotion and prevention in the pediatric population in the past 80 years, and there are evolving research and policy that identify and encourage the use effective preventive medicine

that will improve health, reduce health-care costs, and save lives.

A critical component to promote health and decrease disease is childhood immunization and vaccination. Immunization is the process of creating protections against a specific disease by administering a vaccine or toxin that will stimulate the immune system to produce antibodies against the disease. Typically, the vaccine contains a small amount of the actual disease-causing microorganism. Because of the small dose, the body's immune system fights off and destroys the disease and then has the ability to more easily recognize and destroy the disease in the future. In most cases, once the human body initiates an immune response, it will continuously fight that disease, and a person will never be affected. With the advent of vaccinations, there has been a 99–100 % decrease in some of the most deadly diseases including rubella, measles, polio, diphtheria, and mumps (CDC, 2011b). Even more impressive is that there has been a complete eradication of smallpox worldwide (Hagan & Duncan, 2010; Nelson & Williams, 2007).

Another critical component in promoting health and preventing chronic disease is the development of the Bright Futures guidelines. The Bright Futures guidelines encompass all aspects of the well-child exam, including surveillance of development, physical exams, laboratory work and vaccinations, and the use of anticipatory guidance for families. Bright Futures was developed through collaboration between the American Academy of Pediatrics, the Centers for Disease Control, and the Maternal and Child Health Bureau of the Health Resources and Services Administration. As a result of these efforts, a detailed package of information was compiled to guide pediatric practitioners in evaluation of children at all stages of development (Bright Futures, 2011).

The focus of these guidelines is on family support, child development, mental health, healthy weight, breast-feeding and nutrition, physical activity, universal screening, and physical exams, all of which are designed to ensure appropriate development and preventive health care in the pediatric population. These guidelines are used nationally and encourage standardization of

practice across pediatric practitioners to improve the quality and access to preventive medical care.

## Theories

The overarching theory in pediatric preventive care comes from the public health model. There are four basic concepts to virtually all views of what it means to take public health approach. First is that a public health model focuses on populations. This means that the health of an entire population is the benchmark and intervention efforts should be directed to every person within a population group. Second is that the model emphasizes promotion and prevention. The key is to promote conditions that support optimal health and prevent problems before they occur by addressing the source of those problems. Third is that interventions guided by a public health approach must focus on addressing determinants of health. Determinants are those factors that are part of the social, economic, physical, or geographic environment that can be changed or influenced. And fourth is that the public health model requires a series of action steps that include defining the problem, assessing for risk and protective factors, developing and testing intervention strategies, and assuring that best practices are provided (Miles, Espiritu, Horen, Sebian, & Waetzig, 2010; Taylor, Peckham, & Turton, 1998). Currently, the focus of a public health model in pediatrics is preventive care through such strategies as vaccinations, well-child checkups, nutritional guidance (including breast-feeding), and obesity prevention.

## Research

Research in pediatrics is constantly evolving and expanding. In terms of understanding the effects of childhood disease in adulthood, studies have typically been either retrospective (looking back) or prospective (looking forward). Studies involving the effectiveness of vaccines, breast milk, nutrition, and well-child visits and their effectiveness in preventing disease in childhood and adulthood have used retrospective and prospective

approaches. The studies have been able to review and evaluate past data or follow children to adulthood to determine effectiveness and outcomes of specific interventions starting at birth. Perhaps the most significant research advancement, and the future of preventive medicine in pediatrics, will be impacted by the National Children's Study, a prospective study occurring throughout the United States. Funded as a result of the Children's Health Act of 2000, this study is a multi-year investigation that examines the effects of environmental influences on the health and development of more than 100,000 children. This will be the largest prospective study in pediatrics and will follow children by observation for 21 years to determine etiologies of some of the most prevalent diseases (National Children's Study, 2011).

## Strategies

The collection of data over the years in the areas most important in disease prevention and preventive medicine in pediatrics has resulted in many sets of guidelines to allow pediatric primary care physicians to effectively guide patients to a healthy adult life. More specifically, the ability to follow the outcomes of vaccination use, the incidence of disease in children who are and aren't breast-fed, the percentage of obesity in children with nutrition and physical activity education, and the decrease in chronic disease with episodic visits with a primary pediatric practitioner have all been imperative in the guidelines for preventive disease in pediatrics.

With the addition of the National Children's study that will look at all possible factors influencing childhood and chronic diseases, the future of pediatric morbidity will be greatly decreased. The goal of all of these studies is to ensure healthy living in childhood and ultimately a decrease in chronic disease in adults.

## What Works

### Vaccinations

Vaccinations are the most well-studied and most successfully documented preventive medicine

intervention in pediatrics. Modern vaccines started more than 200 years ago when Edward Jenner developed a smallpox vaccine in 1789 (Kids Growth, 2007). Routine vaccination against infectious disease is one of the greatest accomplishments in public health. Since the original smallpox vaccine was developed, dozens of vaccines have been created and are part of the routine care of children in this country (Jacobson, 2009). Vaccines have saved countless lives and have reduced or eliminated some of the most deadly and rampant diseases in the world, such as smallpox and polio. Currently, in the United States, state laws require particular vaccinations before entering school. Mandated vaccines typically include polio (IPV), measles/mumps/rubella (MMR), diphtheria/tetanus/pertussis (DTaP), Haemophilus influenzae type b (Hib), pneumococcus (PCV), rotavirus, varicella, hepatitis A, and hepatitis B given in a standardized schedule (CDC, 2011a).

To truly understand the significant impact immunizations have had worldwide, it is important to understand the threat and morbidity associated with some of the diseases. Polio is a virus that leads to paralysis, physical disability, and death that killed up to 20,000 people per year in the United States before the polio vaccination was created (CDC, 2011b). With the advent of the vaccine and implementation worldwide, polio currently does not exist in the United States and has been reduced by over 80 % universally. Similar to polio, measles was once one of the deadliest diseases of childhood. Before the immunization was available, a significant number of people contracted the disease, and there were thousands of deaths a year secondary to the disease. With the vaccine, measles is nearly eradicated. Without the vaccine, it is estimated that up to 2.7 million deaths would occur every year worldwide (CDC).

A lesser known but similarly deadly disease is Haemophilus influenzae type b (Hib), which accounted for the majority of neonatal meningitis before the development of a vaccine in 1985. Since the inception of the Hib vaccine, the incidence of Hib meningitis has been reduced by 98 %, and since 1994 there have only been 10 fatal cases of Hib disease a year (CDC, 2011b).

Diphtheria is a serious illness that causes a thick film to form at the back of the throat and produces a toxin that can cause heart failure and neurological symptoms. In the 1920s, diphtheria was a major cause of illness and death for children. In 1921, for example, a total of 206,000 cases and 15,500 deaths were reported (CDC, 2011b). In 1923, a vaccine was developed and new cases of diphtheria were drastically reduced. In fact, by the year 2001, only two cases were reported in the United States (CDC). Mumps, varicella (chickenpox), rubella, and pertussis, which were major causes of illness in the United States before the advent of vaccinations, have now become a rare phenomenon (CDC).

### **Breast-Feeding**

One of the most highly effective preventive measures a mother can take to promote the health of her infant and protect against disease is to breast-feed (U.S. Department of Health and Human Services, 2001). Breast milk contains lymphocytes, neutrophils, cytokines, and antibodies that actively support and stimulate the infant's immune system and help facilitate development and protect infants against infections (Fisk et al., 2011). A series of studies conducted in industrialized countries have shown that children who are not breast-feed for at least 6 months are 3.5 times more likely to be hospitalized for respiratory infections, 2 times more likely to suffer from diarrhea, 1.6 times more likely to suffer from ear infections, and 1.5 times more likely to become overweight during childhood (Li, Fein, Chen, & Grummer-Strawn, 2008).

Currently, new mothers are encouraged to breast-feed, and many have access to lactation consultants and mechanical breast pumps in the hospital. Even more recently, breast pumps are now available to order through insurance, free of cost. In addition to research about the importance of breast-feeding, public awareness has increased through the La Leche League (LLL). LLL was founded in 1956 by seven women who joined together after reading that US breast-feeding rates had dropped to 20%. Over the last 50 years, the league has been influential in

providing educational material to new mothers about the importance of breast-feeding, contributing to an increase in the rate of breast-feeding to 75% in the United States (La Leche League, 2006). With the encouragement and advocacy provided by LLL and the many studies supporting the importance of breast-feeding on a child's long-term health, the number of women who breast-feed has continued to increase. Now, in most cultures, breast-feeding is widely accepted and is considered important for both physical and emotional development. In fact, breast-feeding has been correlated with higher perceptions of mother-child bonding along with lower rates of childhood obesity (DiSantis, Collins, Fisher, & Davey, 2011).

### **Nutrition**

Good nutrition and exercise can lead to healthy brain development and muscle growth, better academic performance, improved self-esteem, and a better ability to cope with stress (American Psychological Association [APA], 2011; Wethington, Sherry, & Polhamus, 2011). Unfortunately, there has been a dramatic increase in the prevalence of obesity in the United States in both children and adults. This dramatic trend has been paralleled by increased rates in cardiovascular-related disease such as high cholesterol, strokes, high blood pressure, and heart attacks and an increasing prevalence of diabetes. Studies have shown a direct correlation between obesity and early mortality from stroke, heart disease, and complications of diabetes (Schwimmer, Burwinkle, & Varni, 2003; Kindblom et al., 2009).

To help aid in the development of healthy eating habits, the US Department of Agriculture (USDA) developed dietary guidelines, which were revised in 2010 (U.S. Department of Health and Human Services, 2010). These guidelines formed the foundation for the "My Plate" program for healthier eating, which was launched by First Lady Michelle Obama in 2011. The current recommendations focus on maintaining balance in caloric intake, consuming nutrient dense foods, building healthy eating patterns, and increasing physical activity.

An example of a successful health promotion and preventive intervention has been the national school lunch program. This initiative was launched in 1946 with the National School Lunch Act signed by President Harry Truman, which was followed in 1966 when President Lyndon Johnson signed the National Child Nutrition Act establishing the school breakfast program. These programs offer federally assisted meals in public and private schools that are low cost or free and nutritionally balanced. The school lunch program serves more than 29 million students daily at a cost of \$7.6 billion (Newman & Ralston, 2006). In January of 2010, President Barak Obama signed the Healthy, Hunger-Free Kids Act which expands eligibility and adds more fruits, vegetables, whole grains, and fat-free and low-fat milk to school lunches. The goal, starting with Harry Truman over 70 years ago, is to provide healthy and nutritious meals to improve health and decrease rates of obesity.

There is clear evidence that nutrition education at an early age improves the likelihood of healthy food choices later in life (Falter et al., 2011). In one particular study, students from kindergarten to second grade took a pretest on nutrition and then received nutrition education. After the intervention, 61 % of kindergarten students, 55 % of first grade students, and 53 % of second grade students significantly increased their posttest scores and demonstrated improved food choices (Falter et al., 2011). The USDA has many age-specific teaching materials, and there is a specific food pyramid for children to encourage learning and understanding about nutritional concepts (U.S. Department of Agriculture, 2011).

### Well-Child Checks

Although well-child examinations have been occurring for decades, it wasn't until 1994 that actual guidelines were established to standardize care for all children nationwide. Under the leadership of the Maternal and Child Health Bureau of the Health Resources and Services Administration (HRSA), the Bright Futures initiative was launched to improve the quality of health services and encourage health promotion throughout the

country. The recommended guidelines from Bright Futures include frequency of visits, developmental milestones, family and community support, promotion of mental health, healthy weight, nutrition, physical activity and oral health, growth charts, and anticipatory guidance in areas such as safety and injury, sexual development, and substance abuse (Bright Futures, 2011). It is the role of the primary physician to provide guidance after a periodic visit by assessing the child and family through observation, surveillance, history, physical exam, and screening examinations (laboratory tests such as lead levels and blood counts). After information is gathered, the most important step to provide quality care to children and families is discussing results and offering anticipatory guidance about how to handle potential problems. For example, depending on the age of the child, anticipatory guidance can be offered regarding techniques for discipline, diet and nutrition, physical activity, sleep habits, toilet training, emotional health, child care, school attendance, "childproofing," seatbelt use, pool safety, understanding inappropriate sexual behavior, substance use, and sexually transmitted disease prevention. With periodic surveillance of every child, chronic diseases and developmental delays can be recognized earlier, and preventable causes of mortality can be avoided.

The use of the Bright Futures guidelines has decreased the number of unnecessary emergency room visits (Lannon et al., 2008). As an example, in a study using North Carolina pediatric offices providing services to Medicaid recipients, increased access to preventive medical care resulted in a decrease in emergency room visits (Piehl, Clemens, & Joines, 2000). Specifically, there were 24 % fewer visits to the emergency room for children who had regularly scheduled and consistent preventive care compared to those who did not. Even more impressive, there was a 37 % reduction in non-urgent emergency room visits. This was attributed to the anticipatory guidance given at all well-child checkups and availability of primary care physicians who were able to divert unnecessary use of the emergency room (Piehl et al., 2000).

Another tool in the arsenal of preventive medicine is the use of growth charts. Growth charts monitor the growth of a child's weight, height, weight vs. height, body mass index (BMI), and head circumference. The charts reflect typical child and adolescent development and are used to identify abnormalities in growth, which can suggest the potential of various diseases. For example, there are specific diseases related to a lack of weight gain, such as cystic fibrosis, that would warrant evaluation if a child is below the fifth percentile in weight and therefore considered "failure to thrive." Growth charts ensure that anomalies are not overlooked so that prevention and early intervention can occur. On the opposite end, trends towards the 90–95th percentiles can assist with early diagnosis of metabolic disorders and obesity, also allowing for early intervention to address the condition or decrease the progression of the disease. Growth charts have increased disease awareness, and as a result they have led to the early diagnosis and early intervention of chronic diseases that are linked to long-term morbidity and mortality.

The combination of periodic well-child checks and the use of trending tools, such as growth charts, has significantly improved the ability of health-care practitioners and families to detect disease, develop early intervention strategies, decrease unnecessary emergency room visits, and reduce unnecessary medical costs. With continued availability of primary care, particularly if provisions in the Patient Protection and Affordable Care Act are implemented, more children will have access to preventive services.

## What Is Promising

The most promising activities occurring in pediatric primary care are related to legislation and research. Legislation, in the form of the Patient Protection and Affordable Care Act (simply called the Affordable Care Act), has the possibility of expanding access to preventive services to millions of children. Research, in the form of the National Children's Study (NCS),

will provide information about the most effective prevention strategies for decades to come.

## Legislation

The Patient Protection and Affordable Care Act (PPACA), signed into law by President Obama on March 23, 2010, along with the Health Care and Education Reconciliation Act of 2010 represents the most significant reform of the health-care system ever undertaken. Often referred to as the Affordable Care Act (ACA), the law recognizes that chronic diseases, such as heart disease, cancer, and diabetes, are responsible for 7 of 10 deaths among Americans each year and account for 75 % of the nation's health spending—and often are preventable. As such, the ACA intends to make prevention affordable and accessible by expanding access to insurance to over 30 million Americans, increasing insurance coverage of preexisting conditions, and requiring health plans to cover recommended preventive services without charging a deductible, co-payment or coinsurance (U.S. Department of Health and Human Services, 2011a). During the writing of this entry, a number of states, organizations, and individual persons have filed suit in federal court challenging the constitutionality of the PPACA; however, federal appellate judges appear evenly divided on the issue, and plans are underway to implement many of the ACA provision, particularly those that address preventive care.

High-quality preventive care helps Americans stay healthy, avoid or delay the onset of disease, lead productive lives, and reduce costs. And yet, despite the proven benefits of preventive health services, too many Americans go without needed preventive care because of financial barriers. Even families with insurance may be deterred by co-payments and deductibles from getting cancer screenings, immunizations for their children and themselves, and well-baby checkups that they need to keep their families healthy. Plans covered by the ACA rules must offer coverage for a comprehensive range of preventive services that are recommended by physicians and other experts without imposing any cost-sharing requirements. Specifically, these



recommendations include evidence-based preventive services (e.g., screening for vitamin deficiencies during pregnancy), routine vaccinations (including childhood immunizations), and preventive care for children as recommended under the Bright Futures guidelines (e.g., regular pediatrician visits, hearing and vision screening, developmental assessments, and screening/counseling to address obesity).

As reported on the government website, health insurance plans or insurance policies beginning on or after September 23, 2010, will be required to provide an array of mental health (e.g., depression and autism screening, behavioral assessments), substance use (e.g., alcohol and drug use assessments for adolescents), and physical health (including dental and vision) preventive services without a co-payment or coinsurance when these services are delivered by a network provider (U.S. Department of Health and Human Services, 2011b).

## Research

Currently, there is ongoing research related to all forms of preventive medicine in the pediatric population from diet to physical activity to vaccinations to breast-feeding. Perhaps the most exciting and promising research is the National Children's Study (NCS). The National Children's Study will follow all enrolled children from birth to 21 years of age. The study is designed to investigate the influence of biologic, environmental, genetic, and social factors on the health and development of children and will include children from approximately 105 geographic areas from approximately 3,000 counties in the United States. Currently, the enrolled participants include women who anticipate becoming pregnant, pregnant women, children born to pregnant women enrolled in the study, or the father of a child from an enrolled pregnant woman. The enrolled participants provide data including physical, community, social, and familial environments (National Children's Study, 2011).

The ultimate goal of the study is to understand all possible factors that influence the health of

children and therefore adults in the United States. The rationale behind the study is primarily from the President's Task Force on Environmental Health and Safety Risks to Children, which focused on the vulnerability of children compared to adults in disease processes. This task force focused on environmental exposures that could lead to developmental effects; high burden conditions associated with environment including autism, diabetes, asthma, and prematurity; and the multiple outcomes attributed to the multiple exposures.

Priority exposures include physical environment, chemical exposures, biologic environment, genetics, and psychosocial milieu. Physical environment will focus on housing quality and neighborhood that the child grows up in. Chemical exposures include pesticides, heavy metals, phthalates (used to make plastic), and Bisphenol-A (also known as BPA). Biologic environment includes infectious agents, endotoxins (found in specific bacteria), and diet. Genetics include the relationship between environment and specific genes. And, finally, psychosocial milieu includes family structure, socioeconomic status, parenting style, social networks, and exposure to media and violence.

Priority health outcomes include pregnancy outcomes, neurodevelopment and behavior, injury, asthma, and obesity and physical development. Pregnancy outcomes will focus on prematurity and birth defects. Neurodevelopment and behavior includes autism, learning disabilities, schizophrenia, and conduct and behavior problems. Injuries include head trauma or injuries requiring hospitalizations. Asthma will focus on the diagnosis of asthma and subsequent exacerbations. And obesity and physical development will focus on obesity outcomes, diabetes, and altered puberty.

These specific exposures and outcomes will be followed for the 21 years of life before adulthood in an observational fashion. The NCS will be the largest long-term study of children's health and development ever conducted in the United States with approximately 100,000 children enrolled. With the large subject count and multiple variables being studied, it is hoped that there will be

a true understanding regarding the role of environment, genetics, and social interaction on the health and development of children.

## What Does Not Work

### Opting Out of Vaccinations

Although vaccinations are highly successful in decreasing disease and death in children worldwide, they have also produced significant controversy. Congress passed the National Childhood Vaccine Injury Act (NCVIA) in 1986 to reduce liability and respond to public health concerns (CDC, 2011c) and to ensure that all children were equally vaccinated and protected against disease. With the mandating of vaccines, there has been controversy over the efficacy, safety, and morality of compulsory immunizations resulting in long-standing tension between two, sometimes divergent, goals: protecting individual liberties and safeguarding the public's health (CDC).

To add to the controversy, there have recently been new claims that vaccinations and the apparent mercury found in the vaccinations have led to autism. The original paper claiming the relationship between vaccination and autism was published in 1998 by Andrew Wakefield in the *British Medical Journal*. He had evidence from an 8-year study concluding that vaccinations caused intestinal disorders that correlated with the symptoms of autism. Based on this study, many leaders and celebrities, not necessarily in the medical field, began to follow this belief and start their own foundations supporting the cessation of vaccination usage, leading many parents to refuse to vaccinate their children. This one paper spawned numerous studies to further evaluate the accuracy of the original finding. The studies focused on the relationship between thimerosal (the additive in the majority of vaccinations) or the MMR vaccine specifically and the characteristics of autism. All of the controlled studies with large participation concluded that neither thimerosal nor MMR exposure had any statistically significant relationship to autism spectrum disorders. More recently, Wakefield's original study was found to be

falsified and not performed under international guidelines for research (Harrell, 2010). The ultimate result was that this study has been labeled fraudulent and there is now no factual evidence supporting a link between autism and vaccinations. Unfortunately, in the time for these studies to be completed and published, many parents chose to withhold vaccinations from their children, and previously rare or eradicated diseases in the United States returned. Hundreds of children were infected with mumps, measles, or rubella, and there were multiple deaths attributed to these diseases (Park, 2011).

Although there has been some controversy that the use of vaccines may harm some children or cause disorders such as autism, the overwhelming professional opinion is that vaccines are the safest, most effective strategy to improve the health of children and adolescents (Third Age, 2011).

### Opting Out of Breast-Feeding or Early Weaning

Although breast-feeding rates have continued to climb and have now reached 75 % in the United States, it was found that only 13 % of infants are exclusively breast-fed at 6 months of age and that this rate is even lower in the African-American community (Fewtrell, Wilson, Booth, & Lucas, 2011). The main reason for this difference in breast-feeding rates for African-Americans is social perception and acceptance (Fewtrell et al., 2011). In fact, social perception and stigma may hinder breast-feeding across all groups. For example, in a national survey of infant feeding practices, fewer than 60 % of respondents believed that women should have the right to breast-feed in public, and less than 40 % agree that it is appropriate to show a woman breast-feeding her baby on TV programs (Pleshette-Murphy, 2007). Such perceptions may lead to reductions in breast-feeding as women may choose to bottle-feed with formula just to avoid embarrassment (U.S. Department of Health and Human Services, 2011c). To ensure that the 75 % of infants who are breast-fed at birth continue to be breast-fed until 1 year of age, there needs to be a change in social perception.

### **Unhealthy Diet**

Unfortunately, one of the most significant barriers to the success of nutrition and physical activity in the pediatric population is access to care and cost. Maintaining a healthy diet can be expensive. When a family can purchase a large pizza for less than ten dollars to feed an entire family, as compared to perhaps double the cost for fresh vegetables and lean meat, eating healthy can be cost prohibitive. With the constant advertising of lower-priced, high-fat, low-nutrient fast food, it is no wonder that children and youth eat poorly.

In addition to the cost of eating healthy, nutrition education funding is not typically a high priority in ever-decreasing budgets. Also, despite legislation mandating meals in schools, many school lunches are often too expensive for low-income families who don't qualify for free lunch (on average, \$540 per child per year). Furthermore, school systems, primarily in low-income areas, do not have the money to put towards the cost of fresh and nutrient-rich foods. As a result, schools turn to foods that are less costly, which often means foods that are processed, high in fat, high in sodium, and high in sugar – all of which having been shown to cause poor health outcomes. Simply put, providing school lunches, despite the best intentions of lawmakers, is not working because students who eat them are more likely to be overweight and unhealthy.

### **Lack of Access to Preventive Health Care**

Unfortunately, as with many areas of medical access, cost of health care and availability of services have had a major effect on well-child check effectiveness. One of the most significant causes of poor health care and lack of preventive care in pediatrics is socioeconomic status and access to primary health care. Children from low-income homes, particularly minority youth, have decreased access and do not get the benefits of positive guidance to promote good health and prevent illness. In 2002, over one-quarter of the children living in the United States did not receive the care and periodic visits recommended by AAP and the Bright Futures guidelines. In the

Medicaid program, only two states (Delaware and Massachusetts) met the recommended participation rate for child health screenings. Eight states were actually below 49 % (Cooper, Masi, & Vick, 2009).

Also limiting the effectiveness of well-child checks is a gap in evidence for well-child care (Moyer & Butler, 2004) and a lack of consistency in utilization. Although many primary care physicians use the Bright Futures guidelines in their practice, almost half of the practicing clinicians caring for children do not (Zimmerman, Gallagher, Botsko, Ledsky, & Gwinner, 2005). Because of lower reimbursement rates and increased time demands (the average office visit is now less than 7 min), many physicians are unable to comply with the guidelines. While guidelines and standardized care have been important, they are not able to work if there is no adequate time to ensure that all children in the nation have the opportunity to benefit.

### **Summary**

“An ounce of prevention is worth a pound of cure.” This well-known quote sums up the importance of health promotion strategies in primary care. Quite simply, preventive medicine improves health outcomes and decreases the likelihood of early death. For young children, the role of the primary care physician is extremely important in establishing a trusting relationship and providing appropriate preventive medical care, including immunizations, recommendations about diet and physical activity, and periodic well-child checks to review growth and development trends. Education and anticipatory guidance are also significant interventions, and many studies have shown the effectiveness of these strategies in producing a healthy child. Although there is evidence that regular, periodic visits with a pediatrician can improve the health of a child, there needs to be additional research to more fully understand the connection between antecedent conditions, health determinants, and outcomes and to develop more efficient and effective prevention and early intervention methods.

Also, preventive medicine in pediatrics does not work if people are unable to participate due to access, capacity, and cost challenges.

And yet, the future of pediatric preventive medicine is bright when considering the possibilities envisioned by the Affordable Care Act and the National Children's Study. Access to preventive care will be improved, and knowledge about how to address the effects of environmental, genetic, and societal factors that contribute to disease in children will be advanced. Pediatric preventive medicine is perhaps the single most important public health strategy to improve the lives of children in the United States and around the world. Promoting healthy behaviors and lifestyles, identifying and intervening early when emotional and physical problems are detected, and mitigating against the effects of chronic disease must be supported in order to maintain the health of all children.

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## Peer Relationships: Promoting Positive Peer Relationships During Childhood

Cynthia A. Rohrbeck and Laura Schaffner Gray  
Psychology Department, George Washington  
University, Washington, DC, USA

### Introduction

As children begin elementary school, opportunities for peer interactions significantly increase (Parker, Rubin, Erath, Wojslawicz, & Buskirk, 2006). Friendships and other peer relationships become more important and more supportive than when children were younger (Buhrmester & Furman, 1987). As children progress through elementary school, the peer group tends to reorganize into subgroups such as clusters or cliques. Peer interactions become less supervised, while the pool of available peers increases. The contexts in which interactions occur also broaden to include schools, extracurricular activities, phone conversations, and more recently, social media opportunities. Increased contact with peers provides opportunity for children to learn appropriate social interactions, form friendships, and identify with peer groups. Children are also exposed to negative aspects of peer relationships, such as exclusion or bullying.

Successful development of peer relationships is important to future development. Children with friends are more socially competent and have fewer psychological problems than those without friends (Hartup & Stevens, 1997). Friendships are also important for school adjustment, motivation, and engagement (Ryan, 2000).

Difficulties with peer interaction skills can lead to behavioral inhibition and even social phobias (Rubin, Coplan, & Bowker, 2009). Children with negative peer relationships, such as bullying, and children who are neglected or withdrawn in larger social networks are at risk for internalizing and externalizing disorders. Interactions with deviant peers may result in increased aggression, drug use, and violence in later childhood

and adolescence. Finally, social network analyses suggest that peer contagion may contribute to obesity, unhealthy body images, and educational failure (Dishion & Tipsord, 2011).

With regard to prevention and health promotion, peer relationships may be viewed as a valued outcome in their own right. In addition, positive and negative peer relationships can predict later adaptive and problematic outcomes, respectively. Finally, peer relationships can also serve as risk or protective factors in the relationships among other variables, especially relationships between stressors (e.g., victimization) and outcomes such as depression.

### Definitions and Scope

Research on peer relationships examines the types, quality, and outcomes of interactions among same-age peers. Children's peer relationships occur at multiple and interrelated levels of social behavior (Hinde & Stevenson-Hinde, 1987). *Social interactions* or *social skills* (e.g., taking turns) may be perceived as intrapersonal skills and considered part of social competence. *Social competence* also includes the ability to form dyadic peer relationships and to function in group settings. *Peer dyads* (voluntary, mutual relationships) include *friendships*, based on mutual affection. *Peer groups* are often based on similarities of individuals and sometimes specific identities (e.g., *cliques*, *social networks*) in larger peer groups who usually interact due to a context (e.g., a classroom). Peer groups have varying levels of homogeneity, cohesiveness, and norms (Rubin, Bukowski, & Laursen, 2009).

Negative peer relationships include bullies and victims. *Bullying* has been defined as aggressive behavior repeated over time towards a victim of lesser power or strength (Olweus, 1993). *Peer acceptance* reflects the child's social status or popularity within a large group and can be positive or negative. Sociometric measures have resulted in several peer categories including *average*, *popular*, *controversial*, *rejected* (including *withdrawn* and *aggressive*), and *neglected* peers. There may also be subtypes of these categories, for



example, “mean girls” who are popular, but also high in relational aggression (Cillessen & Mayeux, 2004). Other descriptions of peers differentiate between children who are actively isolated (spending time alone because their peers reject and isolate them) and those who are socially withdrawn who choose to isolate themselves from the peer group (Rubin, Coplan, et al., 2009).

## Theories

There are several theories that explain aspects of peer relationships. *Attachment theory* argues that peer relationships in childhood can be predicted by early infant-caretaker attachments. *Cognitive developmental theory* emphasizes the role of peer relationships in adaptation and cognitive growth, whether deriving from conflict with peers (Piaget, 1932) or cooperation with peers (Vygotsky, 1978). *Social learning theory* may be the most influential theory on the study of peer relationships. In this theory, children can punish or reinforce each other’s social behaviors and learn appropriate social behaviors through modeling (Bandura & Walters, 1963). More recently, *social ecological theory* (e.g., Bronfenbrenner & Morris, 1998) suggests that social and historical changes may also impact the acceptance and importance of peer relationships. *Contextual-developmental theory* proposes that perceptions of peer relationships differ depending on a culture’s values. *Ethological theory* suggests that social relationships are influenced by evolutionary purposes. Aspects of peer relationships (e.g., attachments, altruism) have developed to help support survival. More recently, *group socialization theory*, based on behavioral genetics research, has suggested that peer relationships are a significant contributor to personality development (Harris, 1995).

## Current Research

Current research in prevention and health promotion focuses on peer relationships at several stages of intervention models. Theoretically, peer

relationships could be perceived as a positive outcome in their own right, and interventions could be developed to promote peer relationships; however, we found no interventions of that type in an extensive literature review. Alternatively, (positive) peer relationships can be a factor or mechanism in the development of other positive outcomes, or they can serve as a buffer in the relationship between stressors and problem outcomes. Similarly, negative peer relationships and influences can lead to negative outcomes or be a moderator of relationships between stressors and maladaptive behaviors.

School is a primary setting for programs that include peer relationships. Promotion programs tend to include some combination of social skills, peer relationships, and/or class/school cohesiveness as common areas of focus. Programs focused more on preventing negative outcomes, such as bullying and externalizing behaviors, may also include rules, guidelines, and consequences for negative peer behaviors. Schools are ideal settings for these interventions since children are in age-based classrooms, the school system has control over the curriculum, and children’s outcomes can be followed over time. In school interventions, professionals, paraprofessionals, or teachers administer the programs to individuals or groups.

Current research on peer relationships is beginning to apply statistical techniques (e.g., multilevel modeling), that may be helpful in understanding the contextual influences on peer relationships. These techniques should also help to disentangle effect of social competence skills and those due to dyadic relationships from the peer contexts in which they occur. Most peer relationship research has failed to use longitudinal designs, preventing conclusions about causal relationships or directions among variables. Current research is predominately focused on the US and Western cultures, and there is little research on how peer relationships may differ in other contexts (Chen & French, 2008).

## Overview of Strategies

Although positive peer relationships contribute to a variety of positive outcomes and healthy

development, they are not usually the direct focus or goal of such interventions. Instead, interventions have used positive peer relationships to (a) promote adaptive behaviors or (b) reduce or prevent negative behaviors (i.e., bullying, drug/alcohol use, behavior problems). Interventions with a universal health promotion or prevention focus are typically implemented school-wide by teachers or trained paraprofessionals in their classrooms. New skills and information tend to be taught through role-playing, group discussions, problem-solving strategies/practice, and games. Many programs include revisions or separate manuals to guide intervention implementation across different ages or grades as children develop.

It should be noted that even those programs that appear more promotion oriented often include a rationale for decreasing externalizing symptoms or disorders. Such programs tend to measure decreases of negative outcomes as a long-term, more distal goal, instead of an immediate post-program goal. Another differentiating characteristic of programs is the level of intervention; some programs are designed to be applied universally to all children, others include additional intervention components for children at risk, and some programs target children who already exhibit externalizing problems. Programs that include components for selective or indicated subgroups of children are often implemented in small groups or used in individual interventions by paraprofessionals or school professionals (e.g., school counselors or psychologists).

Interventions that included positive peer relationships as an important component and/or a measured outcome were included in this review. Certainly negative peer relationships and influences can lead to or be a mechanism for maladaptive behaviors, and there are a variety of studies that include avoidance of negative peers. Nonetheless, studies that only teach children to avoid negative peer relationships are not included in this review since they did not fit the goal of improving peer relationships.

## What Works

A review of the literature revealed several empirically supported interventions (three or more successful trials) designed to increase positive (healthy) peer relationships or peer interactions, in addition to other goals.

Some interventions have been primarily designed to **promote positive peer interactions/social skills and peer relationships universally**, generally with the distal goal of preventing negative peer interactions or externalizing behavior problems. For example, *I Can Problem Solve (ICPS)* focuses on increasing positive peer interactions in order to help children learn to resolve interpersonal problems and prevent antisocial behaviors. *ICPS* is a universal school-based intervention program with three different age-appropriate programs administered by trained teachers (preschool, kindergarten and primary grades, and intermediate grades). The 20-min *ICPS* lessons are taught three to five times per week throughout the school year. The program uses role-plays, games, puppets, and illustrations to help children learn problem-solving vocabulary, identify feelings, and evaluate alternative solutions to interpersonal problems. Evaluations of *ICPS* have shown increased positive prosocial behaviors, including empathy and likability by peers (Shure, 2001; Shure & Healey, 1993). Solution skills have positively correlated with prosocial behaviors, particularly for younger children (Shure & Healey). This program has been rated as effective by the Office of Juvenile Justice and Delinquency Prevention (OJJDP).

Some universal school-wide intervention programs have a broad aim of creating students who have a positive impact in their community. Such programs promote core values in addition to a focus on prosocial behaviors to enhance positive child outcomes while also decreasing negative child outcomes. One example, the *Caring School Community* program (derived from the "Child Development Project") is a school improvement program for children in grades K-6 (Battistich, 2003). This program includes four primary components: class meetings that

provide a forum to discuss and solve problems and to help students better know each other, cross-age buddies, related home activities to reinforce class topics, and school-wide community building activities involving students, parents, teachers, and school personnel. Outcome studies have shown increased student concern for others, improved social problem-solving strategies, and reduced involvement in negative behaviors and drug use (Battistich; Solomon, Battistich, Watson, Schaps, & Lewis, 2000). This program has been highlighted by the US Department of Education, SAMHSA's National Registry of Evidence-based Programs and Practices (NREPP), and OJJDP as an effective program.

Other interventions have **emphasized the promotion of positive peer relationships with both universal and selective components**. *The Incredible Years* (Webster-Stratton & Hammond, 1997; Webster-Stratton, Reid, & Hammond, 2004) is a school-based intervention, consisting of curricula for children from preschool to second grade. This prevention program can be implemented universally and includes over 60 lessons for teachers to deliver through group discussions 2–3 times per week. Activities for both home and school reinforce the skills taught in those discussions, including developmentally appropriate social skills, problem-solving, and school rules. For children who already show behavior problem symptoms, the program has a selective prevention component that can be added; counselors or therapists lead 2-h weekly sessions for those indicated children. Those sessions include training in friendship development, interpersonal problem-solving, and anger management skills. Research has shown positive impacts of this program on social competence with peers, parent and teacher ratings of prosocial behavior, positive problem-solving solutions, and conflict management skills (Webster-Stratton, Reid, & Hammond, 2001, 2004). This program has also been promoted by OJJDP as an effective program.

Teaching children social skills and the ability to regulate their behavior early can help prevent future social, school, and family problems. Greenberg and Bierman designed the *Fast*

*Track* program, a universal preventive intervention that includes academic lessons and tutoring in social skills to promote healthy child development (Conduct Problems Prevention Research Group, 2010; Winn, Newall, Coie, & The Conduct Problems Prevention Research Group, 2007). *Fast Track* has been used and evaluated in several geographical locations. Teachers in grades 1–5 (with a primary focus on 1st graders) teach the *PATHS* (Promoting Alternative Thinking Strategies) curriculum, which focuses on communication, social understanding, self-control, and problem-solving. Furthermore, *Fast Track* includes a selective preventive component for those children most at risk for developing conduct disorder problems. That component includes social skills training groups, in-class friendship enhancement, parent training, home visits, and child tutoring. Parent groups teach behavior management skills and home visits address broader problem-solving skills and help promote family-school partnerships. Program evaluations have shown increased prosocial behaviors, with stronger effects for boys, along with fewer peer nominations of aggression and increased peer nominations of likability (Conduct Problems Prevention Research Group, 2010). Recent research has shown decreased lifetime conduct disorder diagnoses for children in *Fast Track*, although only for those considered most highly at risk (Conduct Problems Prevention Research Group, 2011).

Several empirically supported interventions have less of a focus on promotion of positive peer interactions, although they often teach social skills and problem-solving techniques while **intervening to prevent proximal negative peer outcomes**. One such program is the *Olweus Bullying Prevention Program (OBPP)*: Olweus & Limber, 2010). This school-based program aims to reduce the prevalence of current bullying, to prevent the incidence of future bullying, and generally to improve peer relationships in elementary, middle, and high schools. When a school implements the OBPP, preliminary steps include the formation of a committee that then collects bullying data, reviews the school's specific problem areas, and organizes

a school “kickoff” for the program. The *OBPP* suggests setting clear school-wide rules and trains teachers to consistently punish rule violations. Teachers are trained to hold class discussions and role-plays, to host individual and group parent meetings, and to work with individual children on their personal (interpersonal and academic) goals. Weekly class discussions are held to discuss bullying issues, to promote cohesion in the classroom and throughout the school, and to problem -solve problematic peer interactions. More than three studies have provided effectiveness data for the *OBPP* including evidence of reduced bullying and antisocial behaviors (Kallestad & Olweus, 2003; Olweus & Limber, 2010). While the program has been successful in Norway (Olweus, 2005), evaluations in the USA have shown inconsistent results (Bauer, Lozano, & Rivara 2007).

**Some programs focus on reducing negative peer interactions through selective targeting of children at risk for future difficulties.** One empirically supported example is the Primary Project (Wohl & Hightower, 2001), previously known as the Primary Mental Health Project. In this program, children between preschool to third grade who have been identified with school adjustment problems through early screening participate in one-on-one child-directed play therapy sessions. Children typically receive 10–14 weekly sessions (30–40 min each) with a trained paraprofessional. The program emphasizes identifying and encouraging children’s strengths, ongoing consultation to teachers, and continued assessment to ensure that the intervention meets the child’s needs. It provides an alternative to universally administered prevention programs by providing more intensive interventions for children at risk for increased future social and school difficulties. Outcome studies show that children have improved on social skills, self-confidence, and learning skills while at the same time showing decreased negative behaviors (Crean & Lotyczewski, 1995; Nafpaktitis & Perlmutter, 1998). This program is listed on SAMHSA’s National Registry of Evidence-based Programs and Practice.

## What Is Promising

Some programs that promote peer relationships have shown initial evidence of effectiveness (less than three successful evaluations of their success). These programs are theoretically based, have some research support, and are associated with positive outcomes in children’s peer relationships. Promising programs may make sense to implement, particularly if they target outcomes of interest not addressed by programs included in the “What Works” category above. The *Open Circle Curriculum* is a classroom-based universal program for children in grades K-5 that focuses on strengthening problem-solving, social and emotional skills, interpersonal relationships, and supportive classroom environments (Hennessey, 2007). Based on the theory that early social relationships can foster future academic and social success, this program provides early intervention and training to improve children’s future relationships. The classroom-based curriculum focuses on social and emotional learning, with a variety of topics discussed during class-wide open-circle time, followed by in-class activities, like games and role-plays to reinforce the topic. The curriculum includes training on including others, being a good listener, problem-solving, and regulating emotions. The classroom setting enables students to practice their skills and provides an opportunity for excluded children to feel connected to their classmates and teacher. Outcome studies have shown increased teacher ratings of children’s empathy, problem-solving, and consideration of others, along with increased empowerment and self-worth (Taylor, Liang, Tracy, Williams, & Seigle, 2002). Girls reported reduced adjustment problems and boys reported less fighting and improved social skills (Hennessey, 2007). Although such research support is promising, three successful trials of this program are not yet available.

Interventions focusing on teaching social and emotional learning can utilize a variety of methodologies to introduce new skills. *Talking with TJ* is a school-based, video-presented intervention program for children in grades K-8 that focuses on improving social competence, including

teamwork, diversity appreciation, and group planning (Dilworth, Mokruue, & Elias, 2002; Mokruue, Elias, & Bry, 2005). The current program evolved from the original *Improving Social Awareness-Social Problem Solving program (ISA-SPS; Elias & Tobias, 1996)*. The program has been successfully implemented school-wide (Romasz, Kantor, & Elias, 2004) although program evaluations have shown mixed results. One study found a dosage effect; urban students in schools that included more TJ hours or components had higher ratings in social skills and lower ratings in problem behaviors than student in schools with less exposure to the program. However, another evaluation of the program in a high-risk urban school showed improvements on student self-concept, but no improvement on behaviors (Dilworth et al., 2002). Additional research is needed to move this program from “promising” to “what works.”

Intervention programs may also use school mental health professionals (e.g., counselors, psychologists) to administer the curriculum. The *Social Skills Group Intervention (S.S. GRIN)* was designed as a universal intervention focused on social skills enhancement and bullying reduction; however, it is often implemented selectively, with children at risk for peer problems. *S.S. GRIN* consists of ten scripted lesson plans that are taught in small groups using 60-min weekly sessions. The lessons include social-emotional skills training by didactic instruction and practice with games and activities. The program employs modeling, positive reinforcement, and cognitive reframing to enhance skills in each session. This program is designed for children in grades 3–5 (ages 8–12 years), but has been adapted for pre-kindergarten children, kindergarten through second graders, and adolescents (ages 13–16 years). Evaluation studies have shown increased peer acceptance, decreased aggression, decreased victimization, higher self-esteem, and higher self-efficacy (DeRosier, 2004; DeRosier & Marcus, 2005; Harrell, Mercer, & DeRosier, 2009). It should be noted that there are more than three successful trials for this program, but only two have included child-aged participants. Several interventions have applied a manualized

intervention approach designed to improve social skills in heterogeneous groups of children (some with and some without diagnoses) (e.g., Lefler et al., 2009; Sim, Whiteside, Dittner, & Mellon, 2006). Such programs might be altered and applied more universally as preventive or promotive programs in the future.

### What Does Not Work

It is difficult to state specific examples of peer interventions that fail to improve peer relationships at this time. It is likely that such examples suffer from publication bias. From the current literature, it appears that mere exposure to peers, without specific instruction in social skills (e.g., coaching) or specific required peer interactions (e.g., peer tutoring), is not enough to lead to improvements in peer relationships.

### Summary

Similar to this entry in the first edition, it is notable that there remains a dearth of programs dedicated specifically or primarily to the promotion of peer relationships, despite how important those relationships are to social development and long-term outcomes.

There are also areas in which the role of peer relationships appears to be understudied. For example, given relationships between academic performance, internalizing and externalizing symptoms, and future outcomes, it is important to understand how peer relationships may improve positive outcomes and mitigate against negative ones. With regard to academic success, one would expect that negative aspects of peer relationships (e.g., peer rejection) leads to disengagement, while for other children, the peer group could reinforce successful school behaviors. Similarly, although there are documented negative outcomes linked to shyness or social anxiety, including peer relationship problems, there are few preventive interventions with shy or anxious children and fewer still that include peers or focus on promoting positive peer



relationships (Greco & Morris, 2001). Researchers have begun to examine how fostering social skills may help children with externalizing disorders such as ADHD in clinical settings (e.g., Sim et al., 2006).

Whether peer relationships are studied in their own right or as important in promoting other outcomes, additional generative, contextual, and longitudinal research is needed. For example, little is known about cultural or cross-cultural differences in the importance and development of peer relationships (most of the research included in this entry is from Western sources). Newer statistical techniques (i.e., multilevel modeling) may help to separate contributions of social competence skills, dyadic relationships and group or contextual influences when examining peer relationships. Finally, cause and effect relationships between peer relationships and other variables will be better understood with longitudinal designs.

There are also aspects of peer relationships themselves that are understudied. For example, the dyadic peer relationship research examines same-sex, non-romantic relationships. Research on romantic relationships exists only for adolescents, despite reports of romantic relationships in preteens. That research that exists on romantic peer relationships is constrained to heterosexual romantic bonds and should be broadened in the future. Peer contagion is another understudied area. Despite research indicating the role of peer contagion in negative behaviors, there is little known about whether positive behaviors can be spread by peer contagion processes.

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## Prevention of Birth Defects and Preterm Delivery

Patricia M. Newcomb

Rochester General Hospital/University of Rochester Medical School, Rochester, NY, USA  
RIT College of Science, RIT, Rochester, NY, USA

### Introduction

Across the world today, birth defects (BD) and preterm delivery (PTD) are recognized as significant problems facing humankind today. New energy, evidenced by new initiatives, is moving us closer to the prevention and amelioration of these conditions.

Primary prevention of birth defects would seem to be the ideal approach, but alleviation of the morbidity of some congenital defects and diseases is also a worthy goal. Early delivery (premature delivery, PTD, and premature labor, PTL) is an entity deeply intertwined with birth defects, causing some of them, increasing the morbidity of many of them, and, when appropriately initiated by physicians and caregivers, preventing a handful of them.

### Definitions

A birth defect is an abnormality of structure, function, or metabolism (body chemistry) present at birth that results in physical or intellectual disabilities or death. In a broad sense, a very large set of suboptimal birth outcomes can be classed as defects with this definition. Processes include physical constraints (amniotic band syndromes, clubfoot, etc.) within the womb; pathological conditions in the womb, before, during, and immediately after birth (maternal transfer of infections, birth events such as asphyxiation, environmental toxins and exposures (such as smoking, medications, and chronic maternal conditions like diabetes)); and changing sociological/environmental realities (e.g., congenital

blindness might not be a survivable defect in a preindustrial setting, just as obstructive uropathy in some parts of the world which lack capacity for fetal surgery is still lethal).

Because a person's phenotype (their complete appearance and function down to the cellular level) is accomplished by the daily (and minute-to-minute) production of molecules by genes which interact with the environments (macroscopic, tissue, cellular, extra- and intracellular), classification systems for birth defects can be very intricate. However, these "boil down" to three etiological categories: variant or mutated genes (**genetic birth defects**), both inherited and spontaneous; environmental causes (**environmental exposures**); and **complex conditions** (involving both genes and environments). Included in complex conditions are unknown etiologies for BD (Bale, Stoll, & Lucas, 2003).

Examples of genetic birth defects include holes in the heart (atrial and ventricle septal defects or ASDs and VSDs, most of which are spontaneous and not inheritable (passed on in families from one generation to the next)) and also Marfan's syndrome, Tay-Sachs disease, and polydactyly (which are inherited in various patterns) (Harris, 2000). Examples of environment-caused birth defects include contractures and limb defects due to amniotic bands (strands of membrane or scar in the uterus), direct trauma, direct poisons, and true asphyxia. Environmental suboptimal birth outcomes and preterm deliveries also can stem from infection, such as the "TORCH" illnesses: toxoplasmosis, "other" (includes syphilis), rubella, cytomegalovirus (CMV), and herpes. The fetus may be permanently affected (while in the environment of the womb) by maternal conditions such as diabetes, obesity, and malnutrition or deficit (Davis, Peck, Thompson, Wild, & Langlois, 2010; Stothard, Tennant, Bell, & Rankin, 2009).

Complex birth defects result when both genes and environments are involved and include second-generation effects of exposures, and generational effects passed on without direct alteration of genes (epigenetic effects). Examples of epigenetic effects are changes in the

grandchildren of individuals exposed to famine in WWII and to DES in pregnancy.

In addition, clearly, many conditions which cause difficulty in later life have both a genetic predisposition (a problem in a gene makes it more likely for that individual to develop the condition) and an environmental component. (Some other exposure must occur to cause the individual to develop the problem.) Viewed this way, many chronic diseases of adulthood such as hypertension and heart disease could be technically termed “birth defects” and potentially prevented by optimizing the pre-birth environment! This entry cannot address so broad a group of “birth defects” and will be confined to conditions currently being addressed by societies throughout the world, and in the time frame of just before conception, during pregnancy and delivery, and immediately after birth.

In some cases, a tiny change in a single gene creates a systemic illness (monogenetic disease), as in maple sugar urine disease, which affects neurological development and the excretory system. In other cases, multiple genes must be affected to cause the problem. A heart defect where the blood vessels are reversed in position, called Tetralogy of Fallot, is an example of the latter.

In many cases of single-gene defects, the gene involved is known (as in sickle cell disease). A large portion of birth defects, however, have the complex or unknown etiology. One well-known example of a congenital problem with an unknown, complex, etiology is cerebral palsy. Other examples would be intrauterine growth restriction (IUGR) and preterm delivery (birth before 37 weeks of gestation). Cerebral palsy is highly associated with preterm birth.

The definition of preterm birth is a birth occurring by any means at above 20 weeks of gestation but below 37 completed weeks of gestation (below 20 weeks is a miscarriage (spontaneous abortion in medical language)). Being born with no signs of life at a gestation above 20 weeks is a stillbirth (fetal demise or intrauterine fetal death, FDIU, IUFD). Countries and even individual US states have variable definitions of which losses constitute stillbirth and when and how any

such losses are reportable to state agencies and/or health departments.

The subcategories of preterm delivery are:

Extreme preterm	Less than 28 weeks completed
Very preterm	28–32 weeks
Moderate preterm	32–33 weeks
Late preterm (or “near term”)	34–36 weeks and 6 days

Gestational age (completed weeks of pregnancy) and not actual birth weight is the key feature determining survival and morbidity of prematurity (March of Dimes (MOD), PMNCH, Save the Children, & WHO, 2012).

## Scope

Worldwide incidence of birth defects is 3.2 million births per year and represents 30 per 1,000 births (or 1 in 33 births) (World Health Organization [WHO], 2012a). As a comparison for the magnitude of the problem, 15 million babies are born preterm worldwide. Premature birth (delivery prior to 37 completed weeks) occurs at a rate of 117 per thousand deliveries each year in the USA (1 in 8) and at about 60–90 per 1,000 worldwide overall (WHO, 2012b).

Birth defects (BD) would seem to be a much smaller problem than preterm birth (PTD), but infant mortality research reveals the morbidity of BD. Birth defects cause 20 % of US infant deaths in each year, while PTD causes 17 %. These are raw numbers of deaths using death certificate data (Heron et al., 2009).

Recently, an incisive analysis by Callaghan et al., in 2006, pointed out flaws in the definitions and associations of PTD with US infant mortality, revealing that, in the USA, prematurity and specifically the very low birth weight infants born under 32 weeks actually comprise the highest rates of death (Callaghan, MacDorman, Rasmussen, Qin, & Lackritz, 2006). Thus, prematurity is the true worldwide leading cause of neonatal morbidity and mortality. Still, worldwide, the mortality of birth defects has been

under-recognized, leading to new initiatives discussed shortly.

Even more complexity exists within and between birth defects and PTD: prematurity is highly associated with and may be the major cause of the complex/unknown etiology birth defect cerebral palsy (Centers for Disease Control and Prevention [CDC], 2011, 2012). Preterm premature rupture of the membranes (pPROM) at early gestations, when it does not result in prompt preterm labor and PTD, causes lung malformations and contracture defects of the limbs. Similar risk factors are involved in both conditions (smoking, closely spaced pregnancies, multiple gestation, genetic factors). In fact, the morbidity of BD may be underestimated even in countries, like the USA, with strong epidemiological infrastructures, which previously ranked BD as the most frequent cause of infant mortality (Christianson, Howson, & Modell, 2006; Copeland & Kirby, 2007; U.S. Agency for Healthcare Research and Quality [AHRQ], 2007).

Just as the effects of PTD are lifelong, so too are the sequelae of BDs. Fully half of the childhood (aged 1–2) deaths in a recent Michigan study were in children also identified on the birth defect registry (Copeland & Kirby, 2007).

### Incidence of BD and PTD

Three to five percent of live-born children in the USA (150,000–250,000 per year) have a recognizable birth defect. By later childhood the incidence becomes 6–7 % as cognitive deficits become apparent (Cunningham et al., 1997). The estimated contribution of various causes follows.

#### BD: Estimated Contributions of BD Risk Factors

See Table 1.

The causes of preterm delivery are poorly understood, are multifactorial, and vary by ethnicity. PTD is a “final pathway” and results from varied starting points or triggers. Very little is known about the normal human initiation of labor; it is not even determined whether most PTL is premature initiation of “normal” labor or results from

#### Prevention of Birth Defects and Preterm Delivery, Table 1 Estimated contributions of BD risk factors

Genetic (chromosomal [0.5] and single gene [1.0])	25–30 %
Environmental	5–10
Infections (cytomegalovirus (CMV), rubella, etc.)	3–5 %
Maternal disease (diabetes, alcohol, seizure, malnutrition, vitamin deficit, etc.)	4 %
Drugs, medications, chemicals, radiation	<1–2 %
Mechanical problems (deformations)	1 %
Multifactorial (complex genetic) and unknown	65–70 %

Information compiled from Brent (2011) and Christianson et al. (2006)

Adapted by author, Pat Newcomb, 2013

#### Prevention of Birth Defects and Preterm Delivery, Table 2 PTD types and proportions

Indicated PTD	30 %
<i>Hypertension of pregnancy (preeclampsia) related</i>	50 % (of 30 or 15 %)
<i>Fetal distress</i>	25 % (9)
<i>Growth restriction, abruption, FDIU</i>	25 % (9)
Spontaneous PTL	45 %
pPROM	25 %

Compiled from Goldenberg, Culhane, Iams, and Romero (2008) and Cunningham et al. (2005)

Adapted by author, Pat Newcomb, 2013

a distinct injury or inflammation pathway. Nonetheless, three types of PTD are useful constructs: **indicated iatrogenic PTD** (doctors initiate labor to improve chances of maternal or fetal survival), **spontaneous PTD**, and **rupture of the membranes (pPROM)**. Increased relative risk can be determined, but contribution of individual risk factors to the overall prevalence and incidence of PTD is exceedingly difficult to elucidate. About 50 % of preterm births are estimated to be from unexplained/unknown causes overall (March of Dimes (MOD) et al., 2012).

#### PTD Types and Proportions

See Table 2.

#### PTL/PTD: Possible Contributions to Rates by Risk Factors/Mechanisms

See Table 3.

**Prevention of Birth Defects and Preterm Delivery, Table 3** PTL/PTD: Possible contributions to rates by risk factors/mechanisms

History of prior PTD	10 %
Infection	~12 %
Maternal	?
Chorioamnionitis	?
pPROM associated	?
non-pPROM associated	?
Stretch/volume increase or imbalance	–
Multiple gestation (twins and more)	20 %
Cervical incompetence	<1 %
Infertility treatment/in vitro fertilization	?
Environmental/lifestyle factors	?
Smoking	8 %
Environmental toxins	?
<i>Endocrine disruptors</i>	?
Illicit substances (cocaine primarily)	?
Low maternal weight	?
Obesity	?
Close-spaced pregnancy	?
Vitamin C, other nutrient deficit	?
SES	?
Violence against women	?
Depression	?
Unexplained	50 %
<i>Genetics (African descent)</i>	
<i>Stress</i>	?
<i>Proinflammatory/immune state</i>	?

Compiled from Offiah, O'Donoghue, and Kenny (2012), Goldenberg, Culhane, Iams, and Romero (2008), Tsai et al. (2009), and Cunningham et al. (2005)

Adapted by author, Pat Newcomb, 2013

In the USA, the most common antecedent to PTD in white women is preterm labor; but in African American women, who suffer a three times greater rate of PTD, pPROM is the precursor.

### Prevalence of BD and Preterm Delivery

Prevalence of specific conditions varies widely by country and location. Whenever a country lacks basic public health services, more serious birth defects are prevalent and preterm delivery is more deadly (March of Dimes (MOD) et al., 2012).

About 10,000 of the 200,000 US children born with defects each year have cerebral palsy (CDC, 2011). About 2,750 live-born children per year have a neural tube defect (failure of the spine to

close) per year in the USA (Honein, Paulozzi, Mathews, Erickson, & Lee-Yang, 2001). One percent of all births in the USA are affected by CMV infection. About 3,000 of these suffer congenital anomalies (Morrison, 2000). Approximately 13,200 infants are born to mothers who have a seizure disorder each year (Lewis, Van Dyke, Stumbo, & Berg, 1998). Conotruncal heart defects (which include major malpositions of the great vessels, Tetralogy of Fallot, and duplications in the heart structure) affect 3,000 infants a year in the USA (Botto, Khoury, Mulinare, & Erickson, 1996).

Data on congenital anomalies are usually reported per birth, but with the incidence of 3–5 %, and a vast majority surviving, even though the current existing cases out of the total population of the USA are not reported, the prevalence is probably 9–10 million/330 million.

### Costs to Host/Society of BD and PTD

The costs to the affected individuals from birth defects vary from negligible (*polydactyly*, or extra fingers) to devastating. Similarly, the costs for a near-term premature delivery (say at 36 weeks instead of term (40 weeks)) may be zero, but for a birth near the viability limit of 23–24 weeks, astronomical (potentially one million dollars within the first year of life) (CDC, 2004b).

A victim of the birth defect of cerebral palsy, for example, averages a lifetime cost of \$503,000 in 1992 dollars (\$892,000 in 2013 dollars if general rates of inflation applied. Medical costs in general outpace inflation) (CDC, 2004b). A rough estimate of the cost to the US health system for cerebral palsy alone, per year, is now about 177 million dollars. The annual cost of treating CMV complications alone was two billion dollars in 2000 (Morrison, 2000).

The annual costs of PTD in the USA top 25 billion a year and may exceed 50 billion annually when indirect expenses are considered (CDC, 2004b).

### Theories of BD and PTD

Major entities such as WHO and the March of Dimes (MOD) recognize the magnitude of these



intertwined problems (birth defects and PTD), and, since the first edition of this handbook, increased efforts have focused on the prevention and amelioration of birth defects and prematurity. Meanwhile, research into genetics and the capacity to decode entire genomes has massively expanded, leading to an explosion of information on genes associated with the human condition. From knowing a handful of human genes directly linked to disease and anomalies in the 1960s, we now know of more than 8,000 such genes. This number is rapidly increasing daily (Brent, 2011).

The power of genomic science (evaluating all the DNA of individuals and groups) and of proteome analyses (studying the complete array of proteins individuals and groups make) is being focused on the problem of preterm delivery. This approach is identifying truly novel targets for prevention and therapy (Plunkett et al., 2011).

In 2006 MOD reported on the global effect of birth defects and noted there are two populations affected by the problem in different ways: low- to middle-income countries (the developing world) and high-income countries (industrialized countries like the USA).

They found that 94 % of the births with serious congenital anomalies occur in low- to middle-income countries, as do 95 % of the deaths from birth defects. Nonetheless, in high-income countries, birth defects are a leading cause of death in newborns and infants. Worldwide, the most common genetic or partially genetic defects are congenital heart defects, neural tube defects, hemoglobin disorders (such as sickle cell and thalassemias), Down syndrome (Trisomy 21), and glucose-6-phosphatase deficiency (G6PD) (an enzyme deficiency which, when a trait, helps prevent infection of the individual by malaria – sickle cell trait and minor thalassemias also protect from malarial infection) (Christianson et al., 2006).

Nongenetic defects (environmental defects) such as fetal alcohol syndrome (FAS) and fetal alcohol spectrum disorders (FASD – in which one or a few features of FAS manifest, but not the entire syndrome) and malnutrition effects are harder to analyze but likely affect hundreds of thousands of births each year; and millions of

individuals worldwide are living with the sequelae. The important conditions are four: FAS, iodine deficiency disorders, congenital rubella (German measles) syndrome, and congenital syphilis (Christianson et al., 2006; Strandberg-Larsen et al., 2011).

Experts estimate that 70 % of birth defects can be prevented or ameliorated. Amelioration includes a wide range of therapies such as corrective surgery for heart defects and cleft palates and special diets for phenylketonurics (Carmichael et al., 2012; Correa et al., 2012).

Just as occurs with birth defects, the country in which the affected infant is born determines the outcome: there are more preterm deliveries in low- and middle-income nations, with more than 60 % occurring in Africa and Asia. Mortality is starkly increased in these majority locales, where 90 % of moderately and extremely preterm babies expire within a few days, in contrast to high-income countries such as the USA, where 90 % of babies born at 28 weeks *survive without significant permanent impairment*.

Yet there are lower-tech solutions achievable by low- to middle-income countries which could reduce the death toll for premature infants (March of Dimes (MOD) et al., 2012).

### Preconception Counseling

Preconception counseling is advising parents before they attempt pregnancy how best to optimize their outcome. Preconception and early pregnancy advisement have allowed the USA to reduce the infant mortality from birth defects by 46 % from 1980 to 2001. Low- to middle-income countries have not experienced a similar improvement. Thus, MOD and WHO have developed phased recommendations for the prevention of birth defects and prematurity.

#### Recommendations: Phase 1

- Educate the community, health professionals and workers, policy makers, the media, and other stakeholders about birth defects and the opportunities for effective care and prevention. To achieve this end, each ministry of health should designate an expert or an individual with the responsibility for

coordinating strategies for care and prevention. These strategies need to be woven into existing public health strategies. Ministries do not need to create a new position, but they should ensure that a knowledgeable, trained, and effective person holds this responsibility.

- Promote family planning, allowing couples to space pregnancies, plan family size, define the ages at which they wish to complete their family, and reduce the proportion of unintended pregnancies.
  - Ensure a healthy, balanced diet during a woman's reproductive years through an adequate intake of macronutrients (protein, carbohydrates, and fats) and a broad range of micronutrients. Special attention should be given to adding 400 micrograms of synthetic folic acid daily to the diet through fortification and/or supplementation while also promoting a diet rich in food folates; correcting iodine and iron deficiencies; and removing teratogenic substances, the most important of which is alcohol, from the diet.
  - Control infections in all women of reproductive age.
  - Optimize maternal health through control of chronic illnesses associated with an increased risk of birth defects. These include insulin-dependent diabetes mellitus, epilepsy and its control with antiepileptic drugs, and heart disorders for which sodium warfarin is prescribed.
  - Train physicians, nurses, and allied health professionals and workers in the fundamentals of the recognition of causes and care of children with birth defects.
  - Conduct physical examinations of all newborns by a physician, nurse, or allied health professional trained to recognize birth defects before hospital or clinic discharge.
  - Establish appropriate child health services to care for infants with birth defects.
  - Establish national capacity for surveillance and monitoring of common birth defects to inform policy and to allow for more robust evaluation of national interventions, such as fortification of the food supply with folic acid.
- Promote lay support organizations, including patient/parent support groups, to improve patient care and birth defect prevention by facilitating community and professional education and advocating for increased funding for research on the causes of birth defects.

#### Recommendations: Phase 2

- Train physicians, nurses, and allied health professionals in the essentials of medical genetics. This training should include the recognition of birth defects; means of treatment where possible in the primary health-care setting; knowing when to refer a patient for more specialized treatment; basic genetic counseling, including best practices in communicating unfavorable health information to parents; and support for families who have a child or are at risk of having a child with a birth defect.
- Establish peri-conception medical services to assist women and their partners to attain optimal physical and mental health and well-being at the beginning of pregnancy to facilitate a normal pregnancy and delivery of a healthy infant. These include screening for the risk of genetic, partially genetic, and teratogenic birth defects.
- Implement preconception or prenatal medical genetic screening to identify couples at risk of having a baby with hemoglobin disorders, Down syndrome, blood type incompatibility, congenital syphilis, and congenital malformations, particularly neural tube defects.
- Establish newborn screening to identify congenital hypothyroidism, phenylketonuria, galactosemia, sickle cell disease, G6PD deficiency, and other metabolic disorders.
- Educate the public about birth defects and the steps mothers and fathers can take with their health-care provider to maximize the chances of a healthy pregnancy.

Reproduced with permission from Christianson, A., Howson, C. P., and Modell, B. M. (2006). *March of Dimes Global report on birth defects: The Hidden toll of dying and disabled children, (Executive Summary)*,

pp. 6–7. White Plains, NY: March of Dimes Birth Defects Foundation.

In particular, dispelling myths about congenital and exposure-related anomalies; promoting women's health and family planning to reduce risks from unplanned, closely spaced, and advanced maternal age pregnancies; and controlling teratogenic infections (rubella, syphilis) and morbid infections (which cause death or sterility in women) are essential. Equally important are optimizing maternal health (control diabetes, epilepsy, and conditions needing blood thinners for treatment) and medicines needed to do so; establishing health services for affected children; identifying and monitoring birth defects (to plan for prevention and management); and promoting lay support organizations, research efforts, and education for all.

In the USA, primarily the second phase activities apply. First, it makes sense to avoid disease in the mother whenever possible. If disease is already established in the mother, control its effects, minimizing morbidity. (For example, congenital anomalies in the offspring are reduced if blood sugar is controlled in diabetic women prior to pregnancy.) Second, avoid vitamin or micronutrient deficiencies and toxicities. (For example, folate supplementation helps prevent neural tube defects.) Third, avoid toxins and radiation exposures in both parents. (The paternal contribution is often overlooked.) Fourth, by obtaining complete histories and, at times, genetic testing of the parents, recognize specific inherited conditions for which the couple's offspring are at elevated risk.

Technology now allows us, in the case of in vitro fertilization, to test a potential embryo for genetic defects prior to implantation into the uterus (preimplantation, single cell, genetic screening (PGD)). This is one extreme of treating the problem on an individual basis.

In the general population, antenatal testing for some genetic birth defects can now be accomplished very early in gestation without invasive testing such as amniocentesis. The technique is called "cell-free DNA testing" and finds and amplifies the fetus' DNA from the mother's bloodstream. The obstetric standard of care for

screening average-risk individual pregnant women for Down syndrome now includes this new technology.

Public health theory and practice, on the other hand, hold that population-wide efforts at education or intervention will reach more people with less cost per person (Boyle & Cordero, 2005; Weinhold, 2009). Universal free prenatal visits (as in the Netherlands), financial bonuses for early prenatal care (as in France), nationwide public information campaigns, and supplementation of food products (e.g., with iron or folate) are examples (Agha, Glazier, Moineddin, Moore, & Guttman, 2011). The USA has markedly reduced the incidence of neural tube defects from folate deficiency by universally supplementing grain products (CDC, 2004a; Parker et al., 2010). From 1995 to 2001, neural tube defect birth incidence was reduced by 27 %. This is less than the predicted 50 % reduction predicted by the initial studies. What factors contribute to achieving only about half of the expected benefit? The CDC noted that health-care providers seldom (37 % of the time) advocated to reproductive-age female patients on folate use (Oakley, 2012). The high rate of unplanned pregnancy in the USA (50 % of pregnancies are unplanned) is undoubtedly another contributing factor (Murphy, 2007). Nonetheless, the current reduction of morbidity and mortality in the USA is an example of primary prevention of a birth defect succeeding (CDC, 2004a).

#### **PTD: WHO Recommendations for Prevention**

WHO recommendations to prevent and ameliorate PTD include three major areas: preconception health care and antenatal care, management of preterm labor, and simple improved care of the premature newborn. They also call for a consistent, worldwide classification and surveillance (gathering and sharing data) of preterm deliveries.

#### **Prevention of Preterm Birth**

- Preconception care package, including family planning (e.g., birth spacing and adolescent-friendly services), education and nutrition especially for girls, and STI prevention

- Antenatal care packages for all women, including screening for and management of STIs, high blood pressure, and diabetes; behavior change for lifestyle risks; and targeted care of women at increased risk of preterm birth
- Provider education to promote appropriate induction and cesarean
- Policy support including smoking cessation and employment safeguards of pregnant women

#### Management of Preterm Labor

- Tocolytics to slow down labor
- Antenatal corticosteroids
- Antibiotics for pPROM

#### Care of the Premature Baby

- Essential and extra newborn care, especially feeding support
- Neonatal resuscitation
- Kangaroo mother care
- Chlorhexidine cord care
- Management of premature babies with complications, especially respiratory distress syndrome and infection
- Comprehensive neonatal intensive care, where capacity allows

Reproduced with permission from March of Dimes (MOD), PMNCH, Save the Children, & WHO. (2012). *Born Too Soon: The Global Action Report on Preterm Birth*. In C.P. Howson, M.V. Kinney, & L.E. Lawn (Eds.), (pp. 6–7), Geneva, Switzerland: World Health Organization (WHO).

In the WHO recommendations above, key concepts and terms include:

- Adolescent-friendly care, as younger women are less empowered to control the spacing of their pregnancies and maintain health care (closely spaced pregnancies are also associated with higher rates of BD).
- Prevention, screening, and treatment for STDs, especially syphilis and HIV, as they have devastating effects on the newborns and the mothers' ability to care for them.
- Healthy nutrition including micronutrient fortification (such as Vitamin C (deficiency

possibly associated with PTD) and folate (associated with neural tube defects which frequently cause preterm delivery)).

- Addressing smoking (which reduces the weight of babies, is associated with PTD, and also causes BD).
  - Addressing pollution, indoor and outdoor (which affect the mother's health and are associated with PTD, and many pollutants cause BD also).
  - Effective management of preterm labor includes facility birth and home midwives trained to care for preterm infants; medications to slow labor (tocolysis); medications to improve premature baby lung function (corticosteroids); and antibiotics for women with preterm, premature rupture of the membranes (pPROM).
  - Essential (warm, dry, stimulate infant, and feeding support) care and extra care for preterm includes neonatal resuscitation.
  - Kangaroo mother care is continuous skin to skin care of preterm infant using slings or pouches (which keep baby on mother for warmth, prevention of dehydration, and feeding access).
  - Antiseptics for umbilical cord stump care (prevent infection of these) include chlorhexidine.
  - Then, as infrastructure allows:
    - Respiratory distress syndrome (RDS) and infection management
    - Full neonatal intensive care units (NICU)
- It is estimated that 75 % of the current deaths in the most low- to middle-income countries (sub-Saharan Africa and South Asia) could be prevented without significant investment in sophisticated, expensive, high-technology solutions such as used in the USA.
- An important concept to understand in the prevention of birth defects is the *window of effect* during the pregnancy. Doses of a toxin or exposure might be tolerated without any effect on the fetus if occurring after a critical vulnerable time. Organogenesis (the forming of organ systems in the fetus) lasts from about the third week after conception to the ninth week. This is frequently the most vulnerable time for the fetus and the

time at which exposure will cause a serious defect. For this reason, many doctors advise patients to avoid all medications in the first trimester (first 12 weeks after last menstrual period). Other windows of vulnerability exist for other substances. The nervous system takes the longest to develop in the fetus (continues fast development after birth), and is frequently affected by third trimester exposures (CDC, 2013; Willford, Chandler, Goldschmidt, & Day, 2010).

Similar to the window of effect in birth defects, timing of intervention and amelioration of risk factors for PTD (and PTL itself) is variable and key. Thus, the successful and recently FDA-approved progesterone treatment to prevent PTD must be initiated around 14–16 weeks of gestation (and definitely at least 4 weeks prior to the earliest PTD the woman experienced) and continued to 28–32 weeks to be effective (American College of Obstetricians and Gynecologists [ACOG], 2012b). Similarly, a cerclage (a stitch holding the cervix together), which may be an effective treatment for women with an incompetent cervix, needs to be placed at 14 weeks' gestation (Cunningham et al., 2005).

Latency (the length of time from rupture of membranes to delivery) in pPROM can be increased only by early initiation of therapies (antibiotics and anti-inflammatories) (ACOG, 2007). Tocolytics are minimally effective and may only achieve brief delays in delivery (but there may still be an overall benefit in extreme early PTL, by allowing a course of steroids which hasten fetal lung maturity to be given (ACOG, 2012a).

### Infections in BD and Preterm Delivery

Rubella, which causes congenital rubella syndrome (a constellation of hearing defects, congenital cataracts, microcephaly, miscarriage, and infant death) has been eliminated in the USA, as evidenced by the occurrence of only four non-imported cases between 2005 and 2011 (McClellan, Redd, Abernathy, Icenogle, & Wallace, 2012). But in the rest of the world (low- to middle-income countries), 100,000

cases per year are still occurring. Investment in rubella vaccine programs carries the promise of eliminating rubella worldwide, as has occurred with smallpox (and soon will occur with polio). Meanwhile, maintenance of immunity by encouraging vaccination of US women \*prior\* to conception (as the live-attenuated vaccine cannot be given during pregnancy) is important (Berger & Omer, 2010).

In contrast, congenital syphilis continues to occur in the USA at a rate of 8.7 per 100,000 births in 2010 (about 370 cases) (CDC, 2010) and 150,000 cases yearly worldwide (arising from 1.4 million infected women in pregnancy each year). The morbidity of congenital syphilis does not stop at congenital infection of the fetus, but includes causing stillbirth (250,000 per year) and preterm delivery (65,000 per year) worldwide (WHO, 2013). Currently, efforts are ongoing to develop a syphilis vaccine, but these are hampered by the organism's unique life cycle and poorly understood immunological responses in humans (WHO).

Infections are a key player in PTD also. Both maternal infections such as pyelonephritis (kidney infection) and lower genital tract infections (in certain immunological haplotype subsets) increase the chance of PTD (Hamilton & Tower, 2013). Infections may cause PTD by triggering the inflammation or immune systems in the mother. Infection of the amniotic fluid, placental membranes (chorioamnionitis), placenta, and fetus are all associated with PTD.

Detection of birth defects in utero allows time for definitive action (e.g., termination in lethal defects such as Potter's disease, in which the kidneys and subsequently the lungs do not form, or anencephaly, in which the brain does not form). In nonlethal diseases, early detection clearly improves the infant's outcome, when a therapy that can be promptly initiated exists. Examples would be early detection of heart defects, which allows for planning neonatal surgery, and urethral obstruction, which allows for near normal outcomes for infants undergoing sometimes risky fetal surgery.

## Research in BD and PTD

Evidence-based medicine (EBM) employs the principles of best evidence to determine the most valuable strategy in treatment or in understanding prognosis. The strongest evidence in therapeutic studies comes from randomized, blinded, placebo-controlled clinical studies. Due to a long history of infamous outcomes (such as thalidomide and diethylstilbestrol (DES)), very few new drug trials are currently being carried out in populations of pregnant women. Prognosis studies involve case-matched control studies, whether prospective or retrospective. Data from very large cross-sectional studies are also used (Bermejo-Sanchez et al., 2011).

Randomized controlled trials (RTC) are sorely needed for therapies of PTD. Screening tools need to be developed and validated for the identification of highest risk individuals. And basic research into the etiologies and pathophysiology of both PTD and normal labor (especially initiation of labor) needs to be carried out to fully advance and prevent and ameliorate the majority of PTD.

## Strategies That Work

The best-studied intervention to prevent a specific birth defect is the provision of folic acid to pregnant women to prevent neural tube defects. Multiple studies (with, unfortunately, different dosing regimens) were carried out in several countries in the 1980s and 1990s. Both primary (new, spontaneous neural tube defects) and secondary (prevention in mothers with an affected previous child) preventions were studied. Randomized controlled studies showed a 72 % reduction in the rate of neural tube defects when women received at least 400 micrograms of folate per day. These strong results led the USA to recommend 400 micrograms of folate per day in an average-risk pregnancy and 4 mg/day for women at high risk (or with prior history of an affected infant.) In 1996, the US Food and Drug Administration (FDA) mandated the supplementation of cereals and grains throughout the USA

with a goal of increasing by approximately 50 % the daily intake of folate among all reproductive-age women in the USA to 400 micrograms a day. A classic study showed a 19 % decrease in live-born infants with neural tube defects (Honein et al., 2001).

## Substances

Surely the avoidance of substances known to cause birth defects is an obvious strategy. Yet a bewildering array of substances and exposures have been linked to congenital defects. Substance use is a highly complex behavior both more entrenched and less amenable to treatment than once previously thought. Entire volumes can be written on the risks of defects caused by medicinal and other compounds. The most frequent substances and preventable defects and diseases will be addressed.

## Alcohol

Maternal alcohol intake in pregnancy causes a group of defects known as fetal alcohol syndrome (FAS) and fetal alcohol spectrum disorders (FASD, in which a subset of FAS features are present) in the offspring involving facial and musculoskeletal defects, growth defects, and mental retardation of varying degrees. There is a strong dose response, with increasing defects with increasing alcohol intake (Keelean, Pierpont, Wiley, & McGinty, 2004). Cessation of drinking at any point will improve the outcome (indicating the window of risk extends through the later parts of pregnancy). Fully 70 % of Americans drink some alcohol. Some recent studies indicate that continued drinking occurs in at least 1.4 % of pregnancies. Over the last decades, the incidence of FASD has increased to six births in each 10,000. FAS and FASD are the most commonly identified specific cause of mental retardation in the USA (Cunningham et al., 1997). Progress in the past decade has emphasized recognizing binge drinking as an important cause of FAS/FASD and redefining binge drinking for women as four drinks and more per binge (CDC, 2013).

Widespread education campaigns and warnings on packages have increased awareness of



alcohol's deleterious effects and also the stigma of drinking while pregnant. It is hoped that specific repeated screening in each trimester of pregnancy will aid in identifying problem pregnant drinkers.

### **Tobacco**

As many as 18 % of pregnant women smoke (Morrison, 2000). Recent large studies have demonstrated that fetuses of smokers are at increased risk for placental abruption (early separation of the placenta, often with life-threatening hemorrhage), placenta previa (placenta covering the exit from the uterus), preterm birth, low birth weight, preeclampsia (hypertension caused by pregnancy), developmental delay, sudden infant death syndrome (SIDS), asthma and poor lung function, and congenital anomalies such as neural tube defect, cleft palate, and cleft lip.

While cigarettes are very addicting, more so for women, pregnancy is a window of opportunity for cessation. Often women can delay, cut down, or eliminate use with the benefit for their child as a goal. Counseling should include support strategies, review of facts about quitting (such as that the vast majority of successful quitters had to quit more than once or twice), and consideration of medication. Nicotine causes withdrawal syndromes in infants (has vasoactive effects) and is contraindicated. Bupropion (Wellbutrin<sup>®</sup>, Zyban<sup>®</sup>) is an effective antidepressant which reduces craving and is acceptable in pregnancy.

### **Other Substances of Abuse**

Many substances are abused, but few are proven, in and of themselves, to cause significant birth defects. Cocaine, for example, has been widely studied and deeply feared for potentially causing neurological and development delays. Use of cocaine is associated with preterm delivery, abruption, and preeclampsia. However, no studies have yet identified a long-lasting or permanent ill effect to the infant or increased incidence of birth defects. The "shaking, withdrawing crack baby" is more frequently withdrawing from nicotine.

The true issues to address are complex biological, social, and political factors leading to an overall unhealthy environment for pregnant women. This malignant milieu includes polysubstance abuse, poor self-esteem, domestic violence, poor nutrition, limitations on access to health care, and inability to control the outside environment of the pregnancy (e.g., inability to undertake work with fewer exposures, or to live further from polluted areas, or to space pregnancies appropriately).

## **Strategies That Might Work (What Is Promising)**

### **Preconception Counseling**

Advance preparation with guidance carries hope for preventing many birth defects. Identifying risk factors facing potential parents, and beginning prevention efforts before conception, may offer great potential for optimizing outcomes. However, there are no definitive studies to support this concept overall.

Identification of patients with a high risk of preterm delivery similarly carries hope for continuing to lower the rates of preterm birth in the USA (Martin, Osterman, & Sutton, 2010). These rates have slightly decreased in recent years, including very modest decreases for the past 5 years – to a rate of 11.7, the lowest since 2000 (National Center for Health Statistics & Final Datality Data, 2012).

### **Nutritional Supplementation Prevents BD**

The best-supported preconception intervention (or support) to prevent BD is folic acid supplementation. Some evidence supports the use of multivitamin (prenatal vitamins) to help prevent defects such as cleft palate.

### **Immunizations**

Immunizations carry significant promise for preconception prevention. Many illnesses, such as rubella, can cause defects, stillbirth, or loss. Because immunization for rubella is inexpensive and can prevent severe defects, it is very cost-effective. However, since the vaccine

(an attenuated live vaccine) cannot be given during pregnancy, preconception counseling is the only option (usually, in fact, immediately after the pregnancy in which lack of immunization was noted) (Morrison, 2000).

Other significant infections such as STDs (sexually transmitted diseases), especially syphilis, which causes severe congenital defects, are tracked by state health departments. Adequate preconception or early pregnancy treatment is essential. Varicella zoster (chicken pox), herpes, toxoplasmosis, measles, and mumps are other examples (Klebanoff & Keim, 2011).

### Paternal Effects/Factors

Birth defects can also stem from the paternal genetic contribution, and some opportunities for prevention exist. Data are incomplete but indicate certain paternal occupation exposure (agricultural, chemical- and heavy metal-exposed occupations), environmental factors, and personal history or lifestyle factors such as a history of needing anticancer agents, paternal diabetes, or smoking (Garry et al., 2002) may put the fetus at risk.

Older paternal age is also associated with increased PTD, and, in India, increased paternal education is associated with reduced PTD (Shaikh et al., 2011).

It is easy to connect the presence of a chemical in the fetus' direct environment to a defect in the child when a clear-cut mechanism of transport across the placenta from the maternal circulation exists. It is harder to understand possible paternal mechanisms. The most obvious and easy-to-accept mechanism is direct damage to the gamete (sperm) which fertilizes the egg. This mechanism is known to transmit birth defects in the case of radiation exposure and possibly thalidomide (thalidomide binds to sperm). The damage done can be either *genetic* (direct damage to the DNA molecule in the sperm) or *epigenetic* (alterations to the "support" atoms in the DNA, such as methylation (addition of carbon molecules) changes to sperm DNA).

Other possible mechanisms include the transfer of molecules from the male to the female in seminal fluid during intercourse. These

chemicals, once inside the body, affect the fetus or mother directly. Another *indirect* source of genetic damage is substances brought into the home on the father's clothing. Heavy metals have been shown to be transported this way. When clothing is handled or washed, the mother receives an exposure. Mercury, lead, and beryllium exposures have occurred this way (Olshan & Faustman, 1993). More studies are needed to fully identify these risks and to develop prevention strategies.

Some chronic diseases of later life involve not only a genetic predisposition but also a long, subclinical period in infancy and childhood, during which environmental changes are crucial. Adequate prevention will no doubt improve length and quality of life more than current advances in medication or surgery. Pregnancy is an opportunity to create a better home environment for the child through smoking cessation, reduction of fat in the diet, and decreased alcohol consumption. Currently 80 % of children in the USA exceed dietary recommendations for fat intake. Likewise, reducing tobacco and alcohol use in parents may reduce the prevalence of these habits in adolescents (currently 1/3 are habitual users) (Harris, 2000).

## Strategies That Do Not Work

### Medications in Pregnancy

Disastrous consequences have arisen whenever the balance of risk to benefit has not been carefully considered in treating pregnant women with medication. For example, in mammals, progesterone (the major steroid of pregnancy) is essential for maintaining the pregnancy. Doctors and researchers extrapolated from this and used DES (diethylstilbestrol), a synthetic progesterone with a significantly different structure than natural progesterone which was also active as an estrogen, to combat repetitive miscarriage in humans. The children from these exposed pregnancies suffered deformations of the uterus and cervix, infertility, and a rare form of cancer (*clear cell adenocarcinoma of the vagina*). Some second-generation effects (in the grandchildren of the

DES-treated women) are now noted, such as prematurity and hypospadias (a defect of the urethra in males).

In the case of thalidomide, the fallacy was presuming a drug could be devoid of risks. The medication was widely believed to lack side effects, even though studies of effects were poorly done and very incomplete. When taken during organogenesis, the medication caused shortening and absence of the limbs of the child (phocomelia).

It is important to remember, however, that severe consequences can result in the fetus when maternal disease is allowed to progress unchecked (Mølgaard-Nielsen & Hviid, 2011). Fear of exposure leads many women with severe depression or seizure disorders to stop their medications. But uncontrolled mental illness may incapacitate the mother, result in suicide (or homicide by her or her children), or simply prevent adequate mothering of the child, leading to failure of the infant to thrive. Similarly, uncontrolled seizures in pregnant women may result in prolonged oxygen deprivation of the fetus and severe neurological and developmental problems. Each patient and each drug must be considered for the complete benefit-risk relationship before continuing or stopping medications.

### Infant Support

For PTD, through the bulk of the twentieth century, improvement in preterm neonatal survival advanced based on ever-improving infant resuscitation and support techniques and technologies, such as incubators, culminating in the astonishing impairment-free survival of 28-week infants today. However, experts feel the threshold of viability has been reached, as revealed in the fact that no further improvement has been achieved for survival and disability risk for 22-, 23-, and 24-week infants since 1993 (20 years). The conclusion is that further increases in survival rates must await improved basic understanding of risk factors, etiologies, and physiology which will frame rational and ethical approaches for intervention and prevention (Cunningham et al., 2005).

### Synthesis

Historically, the concept of improving genetic outcomes was limited by the level of intervention possible. This leads to ethically unacceptable actions such as eugenics in Germany, sterilization of non-consenting adults in the USA, and laws concerning miscegenation elsewhere (Fineman & Walton, 2000). In response, genetic health-care professionals have practiced two tenets: (1) never to attempt to influence the outcome of a pregnancy and (2) always to use non-directive counseling techniques. Meanwhile, advances in medical science have allowed options other than abortion to prevent the birth of babies with congenital defects and to significantly improve the quality of life and decrease morbidity for infants born with a genetic defect. Indeed, the public health credo mandates certain interventions such as preventing isoimmunization of future pregnancies by administering RhoGAM to Rh-negative mothers in pregnancy.

The core ethical principles of autonomy (respect for a person's control over his or her own body) and beneficence (the health-care professional's obligation to provide benefit and balance risk versus benefit for patients) come into play in these sorts of decisions. In addition, physicians have an obligation to the health of communities and populations. There are signs that genetic health-care professionals are moving to consider some of the public health-care precepts and to adopt more directive counseling techniques (Fineman & Walton, 2000).

Currently the continued expansion of genomics (and proteomics) and the ever-increasing complexity of and sophistication needed to arrive at rational decisions about birth defects and prematurity risks complicate assisting patients to make decisions. Some indications exist that non-directive counseling in proponent countries may in effect be directive due to many factors, not least of which is this need for simplification (McCabe & McCabe, 2011; Toth, Nyari, & Szabo, 2008). Thus, differences continue to occur among countries in the results of counseling: the UK and some European countries have

seen a drop in the actual population of individuals with Down syndrome (and a very high rate of termination of pregnancy upon diagnosis of Down syndrome), but the USA has not (Cocchi et al., 2010). While terminations for Down syndrome have risen, the fact that a significant minority of women decline all counseling and that more frequently US women and families facing the diagnosis choose to proceed with the pregnancies has resulted in a stable to slightly increased Down population.

This variation of practice and result has led some to sound an alarm of genetic discrimination (Dixon, 2008; Smith & Irvine, 2009). Given that Down syndrome has an extremely variable presentation (ranging from a need for extremely intensive care and early death without ever achieving independent function to a normal-span life with complete independence and significant contribution to society) and that Down syndrome may hold the keys to our eventual full understanding of Alzheimer's and the inner workings of intelligence, it seems short sighted to conclude that nondirective counseling has been achieved or perhaps is even the most ethical path. (Costa, Scott-McKean, & Stasko, n.d.; Einfeld & Brown, 2010). Also, Down syndrome is but the tip of the iceberg, with over 8,000 genetic causes of BD identified, and the cost of individual genotyping halving each 4–6 months.

Meanwhile, the excruciating decisions parents of extremely preterm infants face daily in high-income countries and the utter hopelessness and inequality parents of moderately preterm babies in low- to middle-income countries cope with (when the mere chance of their location dictates the survival of their child) must be averted where possible and compassionately and rationally eased where avoidance is impossible.

The ongoing efforts of global and local entities such as WHO, MOD, and CDC should be supported and applauded, while efforts continue worldwide in research, surveillance, and political and ethical discourse to better discern the best, equitable, just, and right course of action for all.

It is heartening to see discernment on these issues has proceeded this past decade but clear also that the road stretches out before us still.

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## Promoting the Healthy Development of Children Whose Parents Are Alcoholic/Drug Dependent

Laura Jacobus-Kantor<sup>1</sup>, James G. Emshoff<sup>2</sup> and Jeannette Johnson<sup>3</sup>

<sup>1</sup>Substance Abuse and Mental Health Services Administration (SAMHSA), Rockville, MD, USA

<sup>2</sup>Department of Psychology, Georgia State University, Atlanta, GA, USA

<sup>3</sup>Columbia, MD, USA

### Introduction

#### Nature of the Problem

Children of alcoholics and other substance-abusing parents (COSAPs) are considered to be at high risk because there is a greater likelihood that they will develop alcoholism or substance abuse, as well as a range of other psychosocial problems. COSAPs are especially vulnerable to the risk for maladaptive behavior because they tend to have multiple risk factors present in their lives. One of the most potent risk factors is their parent's substance-abusing behavior. This single risk factor can place children of substance abusers at biological, psychological, and environmental risk. Taken as a whole, research reports that children of alcoholics and other substance abusers are at risk for a variety of cognitive, psychological, biological, and neuropsychological deficits. Not surprisingly, the findings of these diverse studies are inconsistent; thus, a unified concept of risk for alcoholism or substance abuse has not yet emerged.

### Definitions and Scope

#### Definition of Unfamiliar Critical Terms

The term "children of alcoholics" (COAs) was established earlier in the literature and is perhaps best recognized by researchers and practitioners.

Although research has suggested that children are impacted differently by exposure to different substances, there are more similarities than differences. Thus, we will refer to the more generic term of children of substance-abusing parents.

#### Scale of the Problem in the USA

Approximately 9 % of US adults, or 20 million people, meet the diagnostic criteria for alcohol or illicit drug abuse or dependence (Substance Abuse and Mental Health Services Administration, 2009). Estimates also suggest that one in four children is exposed to alcohol abuse or dependence in their family (Grant, 2000). There are roughly 74 million children under the age of 18 currently living in the USA, which suggests that approximately 18 million US children have been exposed to alcohol in their family.

Conflicting estimates from data derived from the 2002–2007 National Household Survey on Drug Abuse reveal that an estimated 8.3 million children in the USA, or 12 % of all children in the USA, live in households in which at least one parent is either alcoholic or in need of substance-abuse treatment. Approximately 7.3 million of these children live in families in which a parent abuses or is dependent on alcohol, and 2.1 million live with a parent who abuses or is dependent on illicit drugs. The children living in substance-abusing households are spread across the age spectrum, with 14 % of children under the age of three living with an affected parent and 10 % of children ages 12–17 (Substance Abuse and Mental Health Services Administration, 2009).

Substance abuse is a major public health problem that affects millions of people and places enormous financial and social burdens on society. It destroys families, damages the economy, victimizes communities, and places extraordinary demands on the education, criminal justice, and social service systems. Estimates suggest that alcohol alone costs society 185 billion dollars per year in 1998 and that illicit drug use costs were in excess of 161 billion dollars in 2000 (Office of National Drug Control Policy, 2001).

## Theories

### What Significant Theory and Research Studies Pertain to This Topic?

*Risk Theory.* Risk and protective theory states that a person's probability of engaging in substance abuse is predictable from the combination of risk and protective factors she/he is exposed to. Longitudinal research has identified a number of risk and protective factors that are associated with adolescent and young adult substance use (Arthur, Hawkins, Pollard, Catalano, & Baglioni, 2002; Hawkins, Catalano, & Miller, 1992). These factors exist across multiple levels: peer/individual, family, community, and school. One of the most potent and consistent risk factors for child and adolescent drug use is parental substance abuse (see Thatcher & Clark, 2008, for a brief review of the pathways through which these risk factors may operate). The literature on children of alcoholics far outweighs the literature on children of other drug abusers (Thatcher & Clark). Significantly less is known about children of heroin addicts, cocaine abusers, or polydrug abusers. Many researchers, nonetheless, suggest that the children of addicted parents are at greater risk for later dysfunctional behaviors and that they, too, deserve significant attention to prevent intergenerational transmission of drug abuser later in life.

Children of substance-abusing parents are at great risk for behavioral problems and physiological damage when exposed in utero to their mother's drug addiction. Some of these problems may last well through maturation, although we currently lack the necessary longitudinal data allowing any firm conclusions about the long-term effects of parental substance abuse. Even if children are not exposed to chemicals in utero, they are at greater risk for childhood behavioral problems if their parents are involved in the drug culture.

In 1974, Anthony (1974) discussed the possibility that there were different groups of children of substance abusers and that all children of substance abusers could not be considered a single, unitary entity. Similar experiences affect children differently due to individual differences in things such as temperament, intelligence, and environmental resources – these act as additional risk

and/or protective factors. Given these differences, there is most likely no single profile of children of substance abusers.

*Resilience Theory.* Most important among the varied outcomes observed among COSAPs, there are subgroups of children of substance abusers who, despite all odds, enjoy good health from birth, experience a positive environment at home, and develop normally into socialized, competent, and self-confident individuals. Certain individuals, often referred to as “resilient,” may be more competent in adapting to stressful living environments than others (see Kumpfer & Summerhays, 2006, for a review of resilience theory as it applies to COAs). Such a child is able to compensate and cope with the various negative biological or environmental influences in his/her life. These individuals may be able to manipulate their environment by choosing roles and goals in life that stabilize their developmental process and bring them the positive reinforcement they need to develop a positive self-image and eventually a relatively healthy life. Other individuals may be able to master the environment and to conceptualize the environment in such a way so as to choose positive behaviors that compensate for whatever problems are present. Research examining resilience in COSAPs has identified that resilience is associated with a variety of different factors that stretch across individual-, family-, and community-level domains (Skinner, Haggerty, Fleming, & Catalano, 2009).

*Research on Heritability.* Reviews of the literature on children of substance-abusing parents (Johnson & Leff, 1999) have typically categorized the research into four basic groups of studies. The first group emphasizes the heritability of alcoholism. A recent review of family, adoption, and twin studies concluded that there are moderate to high genetic influences on addiction to a variety of substances (Agrawal & Lynskey, 2008). In one early adoption study, Goodwin, Schulsinger, Hermansen, Guze, and Winokur (1973) compared rates of problems in a group of male children of birth parents who fit the criteria for alcohol dependence and another group of children whose birth parents had no alcohol problems. Results suggested that the

adopted children with a genetic history of alcoholism had significantly higher rates of psychiatric treatment (15 % vs. 3 %) and alcoholism (18 % vs. 5 %) than adopted children without the genetic history. Goodwin (1985) also reported that the prevalence of alcoholism among both male (25 %) and female (5–10 %) relatives of alcoholics exceeds the estimated population prevalence for alcoholics which are 3–5 % for men and up to 3 % for women. The pathway by which the genetic diathesis is expressed is currently a subject of great interest.

*Teratogenic Effects.* The second group of studies consists of those investigating the teratogenic effects of maternal alcohol and other drug use. These studies report strong relationships between in utero alcohol and other drug use and later childhood problems such as minor physical anomalies, hyperactivity, mental retardation, and EEG anomalies (Jones & Smith, 1973). Jones and Smith first described fetal alcohol syndrome as a cluster of four characteristics occurring in the offspring of mothers who drank excessively during pregnancy: central nervous system dysfunction, abnormal facial features, behavioral deficits, and growth deficiency.

*Family Systems Theory and Research.* A third group of studies highlight different aspects of the addicted family environment and family interaction (see Ellis, Zucker, and Fitzgerald (1997) for a review of studies examining aspects of the addicted family environment that impact COAs' risk of developing substance-abuse and mental health problems). Family studies view children from a family illness perspective with regard to the dynamics of the illness and its effects on family functioning. Family studies involve two separate areas of research: the impact of addiction upon family functions and the impact of addiction on the adult COSAPs specifically. These studies typically conclude that the transmission of alcoholism is complex and involves multiple genetic, psychological, sociological, and cultural interactions.

*Developmental Theory and Research.* The fourth group of studies centers on various biological and psychosocial characteristics of children of differing maturational stages who grow up in

addicted families. These studies attempt to isolate biological and psychological variables that differentiate children at risk for alcoholism. Isolating biological mechanisms that may distinguish populations at high or low risk for alcoholism has involved a variety of techniques. Children of alcoholics are differentiated from children of nonalcoholics, for example, on the basis of fMRI activity showing increased activity related to areas of the brain that are related to impulsivity, EEG results, event-related potentials, and enhanced antagonistic placebo response to alcohol cues (Andrews et al., 2011; Newlin, 1985; Rangaswamy, Jones, et al., 2007; Rangaswamy, Porjesz, et al., 2004; Schuckit, Parker, & Rossman, 1983). A significant amount of recent research has also attempted to identify specific chromosomal regions and genes that may partially explain why COAs are at heightened risk for developing alcohol problems themselves. Results of these studies have been mixed (Campbell & Oei, 2010) with some studies concluding that alcohol dependence is associated with specific chromosomal abnormalities or variations, with others failing to detect these differences. Despite many promising leads, this line of research has not yet successfully identified a premorbid biological marker that will accurately predict those who become alcoholic from those who will not.

## What Works

### Strategies That Work

For the purposes of this encyclopedia, "What Works" is defined as interventions and/or programs demonstrating success in three or more trials. To date, a search of the literature did not uncover interventions that met the standard of three successful trials.

## What Is Promising

### Strategies That Are Promising

Although prevention programs that are targeted to COSAPs use a variety of strategies, there are

some elements that are relatively common across programs. These common components include information about alcohol and other drugs, problem and emotion-focused coping behaviors, and social and emotional support. Programs for which there is some preliminary empirical evidence all use some combination of these. For a more complete review of these and other programs, see Johnson, Gryczynski, and Moe (2011).

#### Information About Alcohol and Other Drugs

Prevention programs for COSAPs often include a component that helps children learn about substance-related issues in a developmentally appropriate manner. Although many children may benefit from this information, this type of education may be especially important for COSAPs, as they are more likely than other children to have misconceptions concerning the positive effects of drinking on cognitive and social performance (Brown, Creamer, & Stetson, 1987; Colder, Chassin, Stice, & Curran, 1997). Although the amount and type of information that a child is able to handle will vary depending on a child's developmental level and maturity, programs can help to clear up some of the misconceptions that COSAPs often hold about addiction and substance use.

Another common component of prevention programs is to help COSAPs understand their risk status in a developmentally appropriate manner. Prevention programs can help COSAPs to understand that although they may be at increased risk for a variety of psychosocial problems including alcoholism and substance use, having an addicted parent does not ensure that they will become addicted themselves. However, it is important to convey the information that these children are at higher risk for alcoholism and substance abuse and that their risk of transitioning from casual use to addiction is higher than the general population. Children who are aware of their risk status drink significantly less (in both quantity and frequency) than do COSAPs who are unaware of this information (Kumpfer, 1989).

#### Skill Building

The majority of prevention programs targeted at COSAPs include a component that involves teaching emotion-focused and problem-focused coping skills (Nastasi & DeZolt, 1994). Emotion-focused coping skills may be especially important for COSAPs to acquire because they often do not have control over their parent's drinking habits. By addressing these issues indirectly, COSAPs may be able to regain some sense of control over their lives. Additionally, COSAPs also often benefit from problem-focused coping skills in which the children are taught strategies for living with an addicted parent, such as avoiding driving with an intoxicated parent and explaining parental behaviors to their friends. Other skills often addressed in COSAP prevention programs include communication, stress management, decision-making, and peer resistance.

#### Social Support

Social support may be especially important for COSAPs who often face substantial stresses with relatively little support. By offering COSAPs additional sources of support, programs may assist these children in dealing with the difficult issues that they face on a daily basis. Furthermore, there is evidence that children may benefit not only from receiving support but also from offering support. Some research demonstrates that programs that allow participants to both provide and receive support have the most positive outcomes (Maton, 1987).

#### Evaluation of Prevention Programs in the Literature

Although there are a number of general strategies that have proven successful with COSAP populations, and there is a substantial literature documenting the success of certain substance-abuse prevention programs for the general youth population, there is limited information based on well-designed evaluations regarding prevention programs. A recent review of primary prevention programs designed to reduce alcohol misuse by children and young adults reported that many evaluation reports suffer from serious methodological shortcomings that make interpretation of

their results and generalizability to other populations problematic (Foxcroft, Ireland, Lister-Sharp, Lowe, & Breen, 2003). Specifically, they note that many evaluation designs and reports are hampered by high levels of attrition and inadequate randomization procedures. The results of their review suggest only limited support for programs that utilize short-term (up to 1 year) and medium-term (1–3 years) follow-up periods. Significantly stronger support was found for the few programs that reported longer-term follow-up periods. While this review was not limited to programs that targeted a COSAP-specific population, many of its findings also likely apply to COSAP-specific programs and populations. To the extent that these programs are successful in reducing alcohol misuse in a primary population, COSAPs will also likely benefit as they are also part of the intended target group.

In a review of COSAP-specific interventions, Kumpfer (1999) notes that many programs utilize self-developed measurement tools whose psychometric properties are unknown. The vast majority of these instruments are used only once, prohibiting the comparability of results across studies (Johnson, Rolf, Tiegel, & McDuff, 1996).

Kumpfer also notes that many evaluations fail to be sensitive to the fact that prevention programs may be differentially successful with different types of children. Thus, in order to demonstrate the true effectiveness of an intervention, evaluations should examine not only the overall effectiveness of programs but also the ways in which different subpopulations of participants responded to the intervention. Additionally, because many prevention programs are designed to address a number of risk factors, the results of prevention programs may not be immediately apparent and may not be manifest until several years after the intervention has completed. In order to effectively measure these outcomes, researchers must investigate and utilize more effective ways to collect longitudinal information with this population.

Despite these numerous design and measurement issues, several prevention programs have documented considerable success with COSAP

populations. Listed below is a brief overview of several of these programs.

#### Strengthening Families Program

The Strengthening Families Program (SFP) is a family-based prevention program that has been shown to increase resilience and decrease alcohol, tobacco, and drug use among elementary-aged children of substance abusers (Kumpfer, DeMarsh, & Child, 1989). The basic intervention includes providing participating adults with parenting skills, children with social skills training, and a family enhancement program in which children and their parents both participate. Typically the program is conducted in churches or community centers in brief sessions of 2–3 h. Although originally designed for children ages 6–11, modified versions of the SFP have been developed for children in varying age ranges from 3 to 16. The Strengthening Families Program is the most widely replicated and studied of the programs described here, though most studies have not focused specifically on the subpopulation of COSAPs.

Long-term follow-up with participating children has shown that its effects persist over time. A 5-year follow-up study demonstrated that the program was effective in reducing rates of alcohol and drug abuse among children age 10–14 (Spoth, Guyll, & Day, 2002) and resulted in an estimated cost-benefit ratio of \$9.60–1. Ten-year follow-up studies have demonstrated that participating children reported significantly lower levels of lifetime mental health disorders compared to other children (Spoth et al., 2005; Trudeau & Spoth, 2005).

The Strengthening Families Program has been modified for a variety of cultural groups including rural and urban African-American COSAs, Hawaiian COSAs, Hispanic COSAs, and rural preteens (Kumpfer, Pinyuchon, Teixeira de Melo, & Whiteside, 2008). Evaluation studies showed that the basic program with minor cultural revisions was more effective than a substantially revised program. The authors concluded that the core content of the program should not be deleted when making cultural



revisions. As a result of positive outcomes of SPF replications, NIDA has chosen SFP as a model substance-abuse prevention program for dissemination.

#### Focus on Families Program

The Focus on Families Program (Catalano, Haggerty, Fleming, Brewer, & Gainey, 2002) is a family-based program that targets chemically dependent parents and their children. By providing families with parent-management skills and at-home case-management services, the Focus on Families Program attempts to reduce the risk of relapse by parents and prevent substance abuse among their children.

Evaluations have indicated that parents participating in the program demonstrate increased general problem-solving skills and drug-refusal skills at a 24-month follow-up assessment than parents in a control group. Parents also reported using significantly less heroin at the completion of the program and at the 12-month follow-up, as well as less cocaine at the 12-month follow-up. The evaluation also revealed a reduction in both drug use and delinquent behaviors at the 24-month follow-up. Although this program did not demonstrate statistically strong changes in child behaviors, the evaluators suggested that the sample of children used in the evaluation might have been too young for the program to demonstrate efficacy in reducing problem behaviors (Catalano, Gainey, Fleming, Haggerty, & Johnson, 1999).

Long-term (12–15 years) follow-up of participants has revealed that overall children who participated in the Focus on Families Program were equally likely to develop a substance-abuse disorder as a randomized control group. However, further analyses suggested significant gender differences. While male participants demonstrated lower rates of substance-abuse disorders, female participants did not (Haggerty, Skinner, Fleming, Gainey, & Catalano, 2008).

#### Creating Lasting Connections

The Creating Lasting Connections (CLC) program (Johnson et al., 1996) is designed to address a number of risk and resiliency factors

that are associated with alcohol and other drug (AOD) use among high-risk youth. Although this program is not specifically targeted at COSAPs, it includes several components that might be effectively utilized with COSAP populations.

The CLC program attempts to increase family resilience to AOD by increasing parent's knowledge of AOD issues, improving family management skills and communication skills, providing positive role modeling of alcohol use, increasing community involvement with their children, and the utilization of community services if the need arose. In addition, the CLC program attempted to increase youth resilience by improving communication and refusal skills, family bonding, community involvement, and use of community services when situation warranted. Families participating in the program also receive follow-up care for 1 year.

Evaluations of the CLC program have utilized an experimental design. Evaluations have indicated that parents participating in the program demonstrate increased knowledge about AOD information and family use of community services. In addition, the program demonstrated some success in increasing youth resiliency by increasing the utilization of community services when need arose, increased bonding with family members, improved communication skills, and increased community involvement under some conditions. As a result of these successful prevention efforts, the Creating Lasting Family Connections program has been chosen as 1 of 16 exemplary prevention programs by the Center for Substance Abuse Prevention and the National Prevention Network.

#### Students Together and Resourceful

Students Together and Resourceful (STAR) is an intervention that is based on a community psychology orientation. One goal was to provide students accurate information concerning alcohol, alcoholism, and family reactions to alcoholism in order to understand the etiology of alcoholism and to reduce self-blame. A secondary goal was to increase social competence and both the quantity and quality of peer relations. Group exercises were designed to

facilitate the identification, acceptance, and expression of feelings. A related goal was that of improving the social network of participants. Specific skills such as problem-solving, decision-making, stress management, and refusal skills were emphasized. In short, the intervention was designed to do what parents normally do: help children learn to live with themselves in their environments, to establish good relationships, and to make constructive decisions and follow them through.

A strength of this program was the use of a wait list control group who received the intervention at a later time. The analyses consisted of comparisons between the control and treatment groups over time, strengthening the argument that outcomes were a result of the intervention. Participants were successful in establishing stronger social relations, a sense of control, and improved self-concept. Participants reported increases in the number of friends, peer involvement, and perceived social support. Participants also reported decreased loneliness and depression (Emshoff, 1990).

#### CASASTART (Striving Together to Achieve Rewarding Tomorrows)

CASASTART is a school-based prevention program for high-risk youth developed by the National Center for Addiction and Substance Abuse at Columbia University (CASA). The program targets children age 8–13 who report at least four risk factors, one of which is parental substance abuse. CASASTART provides children with intensive case-management, educational, and mentoring services. Case managers work closely with both children and their families to help identify and secure additional services such as family counseling, parent training, and substance-abuse treatment as necessary. Evaluation results suggested that children engaged in CASASTART demonstrated lower rates of drug and alcohol use and lower rates of violent crime in the previous year compared to a control group (Harrell, Cavanagh, & Sridharan, 1998, 1999).

#### Celebrating Families! Program

Celebrating Families! is a 16-week program designed to address the needs of children age

6–11 and their families. The program targets families in which at least one parent is in the early stages of substance-abuse treatment and there is deemed to be a high risk for child abuse or neglect. Children and parents participate in weekly education and skill-building sessions that are designed to help break family cycles of substance abuse. Evaluation results (Lutra Group, 2006) have suggested that participating parents demonstrated improved parenting skills, decreased alcohol and drug use, and lower rates of depression. Participating children reported lower rates of depression and increased social skills, but also higher rates of hyperactivity and aggression. While early results are promising, these findings should be interpreted with caution, as the evaluation design did not include a control for most analyses, and instead reported pre- and post-intervention differences.

#### The Betty Ford Children's Program

The Betty Ford Center Children's Program operates a four-day, intensive prevention program for COSAPs ages 7–13. The program is based on the philosophy that addiction is a family disease and that the whole family, including children, can benefit from treatment. Children are required to attend with at least one parent or caregiver, who is required to abstain from substance use during the duration of the program.

Counselors and trained volunteers use a variety of developmentally appropriate techniques, such as art, games, storytelling, and role playing to provide children with education about substance use and addiction, to help them identify and talk about their feelings, to gain assertiveness, and to learn coping and stress reduction techniques. On the last day of the program, children and parents work together to develop plans outlining how they will practically apply the information and skills gained during the program. Additional ongoing support is provided for families. Local families can participate in weekly continuing care groups, and all children are provided with access to a 24-h hotline that provides a mean of ongoing support.

Evaluation results (Moe, Johnson, & Wade, 2008) suggest that this brief, intensive program suggested that participating children reported lower levels of loneliness, increased knowledge about substance abuse and addiction, as well as an increased recognition that they cannot control their parent's substance-abusing behaviors.

#### Children's Program Kit

An additional resource for programs that serve COSAP populations is SAMHSA's Children's Support Kit – Supportive Education for Children of Addicted Parents (Substance Abuse and Mental Health Services Administration, 2003). This comprehensive toolkit, which was developed by the National Association for Children of Alcoholics (National Association for Children of Alcoholics, 1998), includes information, materials, and practical assistance to help program design and implement interventions that target children from addicted families. The toolkit includes materials that are appropriate for use with a variety of developmental stages: from elementary-school-aged children to young adults. The toolkit also includes practical advice designed to assist programs to implement interventions, such as information on assessing program readiness to offer services, and evaluation advice and materials. A second version of the kit, which focuses on Native American populations, the Native American Children's Program Kit, is also available. Although no formal evaluation of these materials exists, these remain a popular and commonly utilized resource, with over 100,000 copies of the toolkits having been distributed by SAMHSA to date.

#### Incorporating Prevention into Existing Practice Settings

Another promising primary prevention strategy is to incorporate screening and referral for familial substance abuse into the normal procedures used by those that see children on a regular basis. Towards that end, the National Association of Children of Alcoholics, assisted by the Office of National Drug Policy, the Center for Substance Abuse Prevention, as well as other leading health organizations, has developed a set of core

competencies for use within primary-care health settings (Adger, McDonald, & Wenger, 1999). Pediatricians, who tend to have frequent contact with both children and their parents, are in an opportune position to conduct a brief screening to assist in the early identification of COSAPs and to provide information and referrals that may help to prevent future difficulties (Werner, Joffe, & Graham, 1999). Recent guidelines from the American Academy of Pediatrics have acknowledged this role and have suggested that pediatricians "screen for and evaluate the nature of substance use among patients and their families" (Kulig, 2005). Although many health-care providers still believe that substance-abuse problems are the domain of mental health professionals, a growing number of health-care providers are becoming involved in the identification and referral of COSAPs to appropriate services. There is also growing evidence that parents are both willing to participate in screening for alcohol problems in a pediatrician's office and are also willing to accept brief interventions if they screen positive for alcohol problems (Wilson et al., 2008).

#### What Does Not Work

The research base on interventions with children of alcoholics is still largely incomplete. Many interventions are provided with little, if any, evaluation. While some quality intervention studies have been conducted, relatively few report long-term follow-up data on participants, and few studies have been even modestly replicated. Thus, similar to the "What Works" section, it is premature to either endorse any specific strategy as conclusively effective or ineffective based on the available empirical evidence.

#### Summary

The risk status of COSAPs is undeniable. While risk for some specific outcomes may be questionable, there is no doubt that COSAPs experience an increased probability for substance abuse and

other negative psychosocial characteristics. Given the epidemiologic research, there is no doubt that COSAPs are a worthy target for primary prevention. To date, there is no single program that has been tested with sufficient rigor, using psychometrically sound instruments, with multiple replications, overextended periods of time, and diverse samples of COSAPs to warrant its identification as the model preventive program. However, a number of programs and practitioners have provided convergent evidence regarding some principles of intervention that seem worthy of consideration.

Successful prevention programs that are targeted to COSAP populations share many of the same characteristics of successful prevention programs designed for other populations. Prevention programs that are of a longer duration offer participants an opportunity to participate in some form of follow-up care or “booster” sessions and have characteristics that allow intervention results to be generalized to everyday settings and are more likely to demonstrate success than interventions that do not share these characteristics (Botvin, Baker, Filazzola, & Botvin, 1990; Lochman, 1992).

Programs targeted at this population must remain cognizant of the fact that COSAPs represent a remarkably heterogeneous group. Thus, prevention programs targeted to COSAP populations should avoid utilizing a narrow focus. A broad range of strategies that address a number of different risk and protective factors and the diverse needs and characteristics of COSAPs is recommended.

One dimension of diversity is the range of outcomes experienced by COSAPs. While COSAP status implies risk, it does not imply a predetermined inescapable outcome. The resilience and normality of many COSAPs must be recognized. Prevention programs targeted at COSAP populations should remain cognizant of the negative impact of assuming pathology and the consequent effects of labeling on COSAP populations. One way in which these effects can be lessened is if programs are designed to be delivered to all children, not only COSAPs. This approach has the added benefit of allowing

programs to reach COSAPs who would not ordinarily be identified as such. By allowing larger numbers of individuals access to these programs, researchers can ensure that their prevention services are received by all affected children, while also reducing the stigma attached to their delivery. The use of non-stigmatizing settings (e.g., schools, community centers, and churches) may also reduce the stigma attached to receiving COSAP services.

Because peers exert such a powerful influence on substance-use decisions (Hawkins et al., 1992), interventions that are broadly targeted to include both COSAPs and their peers may prove to be more effective prevention strategies than those that utilize more narrowly targeted groups. Interventions that are designed to target COSAP populations may also prove more successful, and more easily generalized, when peers are included as facilitators. Past research has demonstrated that substance-abuse prevention programs in which peers instruct and practice program components with participants are better generalized than are programs that do not incorporate the use of peers (Botvin et al., 1990).

Continued and expanded research is imperative. We need to know more about the differences between COSAPs and children from other dysfunctional families and stressful environments. The epidemiology and etiology of diverse subpopulations of COSAPs need to be explored. The development and evaluation of prevention programs could benefit by attention to many of the issues described in this entry. Despite these limitations, there is no doubt that the effort and concern focused on this population has improved the lives of many children.

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## Religion and Spirituality During Childhood

Wendy L. Kliewer<sup>1</sup>, Kathryn Reid Quiñones<sup>2</sup>, Nikola Zaharakis<sup>3</sup> and Everett L. Worthington Jr.<sup>3</sup>

<sup>1</sup>Department of Psychology, Virginia Commonwealth University, Richmond, VA, USA

<sup>2</sup>Children's Hospital of the King's Daughters, Norfolk, VA, USA

<sup>3</sup>Virginia Commonwealth University, Richmond, VA, USA

### Introduction

There is a growing recognition among researchers, educators, and health professionals that children are spiritual beings (Adams, Hyde, & Woolley, 2008; Hart, 2003). That is, children, as all humans, have the capacity to connect and relate to others, to the world, and to a transcendent dimension. This recognition stems in part from a holistic view of education – a desire to focus on the development of the whole child – and from health-care professionals who attend to children's physical, emotional, social, and psychological needs. Worldwide children today face a range of stressors – both acute and chronic – which heighten their risk for mental and physical maladjustment. Yet not all children are at equal risk for developing adjustment problems. Some children show resilience, which refers to a dynamic process encompassing positive adaptation within the context of significant adversity (Luthar, Cicchetti, & Becker, 2000). The religiosity and spirituality of a child (or a child's family) are among the factors that may help children weather the stressors and crises that come their way. In the past decade, researchers have made progress in understanding how religiosity and spirituality affect a child's ability to cope with stressors and how religiosity and spirituality influence normative development. However, this area of research is still in its infancy.

### Definitions and Scope

Scholars recognize that religion and spirituality are distinct, albeit overlapping, constructs (Grimes, 1999; Hill et al., 2000). *Religion* is defined here as the individual and corporate search for the sacred that has been formalized into an institution. *Spirituality*, which is the broader construct, refers to one's experience of closeness and connection to what one considers to be sacred (e.g., God, Divine being, or nature; Hill et al., 2000). Spirituality can be classified based on the object that one considers to be sacred. For example, within *religious spirituality*, a person experiences a sense of closeness or connection with the sacred – usually God or a Divine being – by involvement in a religious community with agreed-upon beliefs and practices that frame one's experience of the sacred.

The percentage of children (preadolescents) in the United States or elsewhere who consider themselves either religious or spiritual has not been quantified. However, relatively recent data on American adolescents (Smith & Denton, 2005) revealed that most (84 %) American adolescents believe in the existence of God and most (51 %) indicated that their faith is extremely or very important. An additional 31 % indicated that faith was somewhat important; 18 % of those surveyed indicated that faith was not very or not at all important. A 28-country survey of 14-year-olds (see Torney-Purta, Lehmann, Oswald, & Schulz, 2001) revealed that a minority of adolescents participate in religious organizations. Highest participation rates were in the United States and Cyprus; low participation rates were observed in Northern, Western, and Eastern Europe. A country and culture's religious traditions influence the extent to which children and adolescents will participate in organized religious activities (Inglehart, Basañez, Díez-Medrano, Halman, & Luijckx, 2004). The extent to which children see themselves as "spiritual" worldwide is unknown.

Several authors have argued that spirituality is an integral part of the human experience. For example, Hart (2003) suggests that it is helpful to think of humans as spiritual beings who have

human experiences rather than human beings who may have spiritual experiences. Thus, Hart places a central focus on individuals' capacity to interact with the transcendent and thus normalizes this kind of experience. Newberg and Newberg (2008) propose a neuropsychological model for developmental spirituality that people are – in the words of the title of their article – “hardwired” for God. Adams and colleagues (2008) note that for many people, connectedness to the self, to others, to the world, and to something that transcends themselves (i.e., God or the sacred) is at the core of spirituality. In their book *The Spiritual Dimension of Childhood*, Adams et al. (2008) describe ways in which children have spiritual experiences. Adams et al. do not treat religion as a mere cognitive framework, but they include natural moments of awe and wonder. There often does seem to be a sense of mystery in what children see or sense. Another variety of spiritual experience is children's inquisitive and uninhibited interest in death and related issues. These observations by Adams et al. are consistent with Braatvedt's (2007) view that childhood is a “natural sanctuary for the spiritual qualities for which adults must constantly struggle.” That is, children are less apt than adults to quash their curiosity and sense of mystery about things we cannot see or explain in the natural world. In an Internet article, Braatvedt identified qualities of children that make them especially sensitive to spiritual experiences including “an uncluttered simplicity that enables free thinking and exploring, an openness to spiritual matters, an ability to be trusting in relationships and to be dependent on others, an everyday sensitivity to experiences of the sacred, and keen awareness of the immanent presence of God in everyday life.”

## Theories

A variety of theorists have speculated about how people develop faith. The theory most relevant to childhood is by Elkind (1970), whose ideas were based both on his own research and on Piagetian perspectives on development. Elkind found that a child's learning of object permanence in early

childhood prepared him or her for the notion of a God who is not physically present. School-aged children who became aware of death – even though death might not have actually touched their experience – “solved” their problem of loss by developing the notion of life after death. The need to “conserve” life provided a platform for developing theological conceptions, regardless of whether children were raised in explicitly religious families. Elkind also found the emergence of logical thinking readied children to think of how God might be represented symbolically and perhaps worshipped. Barrett (2011a) has updated Elkind's (1970) seminal thinking. Barrett has championed the cognitive science of religion, in which he has shown how human cognitive systems inform and constrain religious thought, experience, and expression.

Barrett (2011a, 2011b) based his conceptions on four premises. First, scholars in the cognitive science of religion reject full-blown cultural relativism. Second, they believe that some aspects of the content of human behavior and cognition (and in this case religion) are extra-cultural or “universal,” suggesting that virtually all normally functioning people share them. That is, some religious thoughts, experiences, and expressions are human regardless of culture. The desire for meaning might be one such example. Analogously, these universals are like the foundation and frame of a building. Third, cultural learning informs and constrains religious thought, experience, and expression. Analogously, culture builds different looking and functioning houses on the universal frames. Fourth, the focus of cognitive science of religion is across individuals, not within individuals. Thus, Barrett (2011a) points out that experiences like James' religious experiences, which are highly mystical and not experienced by all, are not the focus of cognitive science of religion (but that does not invalidate them as individual or minority experiences worthy of scientific study). Barrett (2011a) has shown that scholars in the cognitive science of religion have found universal foundations of children's ideas about (1) the design and origin of the natural world; (2) death and beliefs about afterlife; (3) magic; (4) religion and its

relation to morality; (5) religious development in children as they age and gain capabilities; (6) religious ritual; (7) religious social relations; (8) the relationship among souls, minds, and bodies, (9) spirit possession; (10) transmission of religious ideas; and (11) various concepts about superhuman agents.

In addition to theories of faith development and the development of religious thought, experience, and expression, there are several perspectives on the mechanisms by which religion and spirituality influence child development and well-being. Although children may have natural inclinations toward spirituality (Barrett, 2011b), the religiosity and spirituality of parents play a considerable role in the types of formalized experiences children will have (Clark, Worthington, & Danser, 1988). Some of this influence by parents might occur due to psychodynamic theoretical propositions of attachment to God as a projection from relationships with primary caregivers. Psychologists of religion (e.g., Miner, 2009) do not doubt that such influence occurs, but it cannot account for all of children's (and later adults') attachment to God. Modeling might account for some effects of parents. But the power of the situation also might account for much of the influence (Ross & Nisbett, 2011). Most children have little choice about whether and to what extent they will participate in religious activities within or outside of the home. Parents determine whether and where the family will attend religious services, to which and how many religious activities the child will be exposed, and how, when, and how often religious activities will be incorporated within the home. Parents decide whether children will attend public or religious schools or (increasingly) whether children will be homeschooled. Parents decide who the majority of playmates of their children are. In addition, parents determine the degree to which religious experiences that the child is exposed to will be more a matter of form (which might promote a low-spirituality religious orientation in the child) or warm personal experiences (which might promote vibrant religious commitment and spirituality).

Of course, how the child will ultimately respond to the early religious or spiritual

experiences also depends on the child's personality and disposition, which in turn is dependent on both genes and experiences. Is the child fundamentally agreeable? Perhaps the child will go along with the parents more than a child who is not agreeable. Is the child conscientious? Perhaps the child will filter his or her experiences to be more receptive to conscientiousness-based religions (Worthington, Berry, & Parrott, 2001). Is the child extraverted? People-oriented influences might be received more readily than less people-oriented influences. Is the child fundamentally open to experience? Perhaps the child will be more influenced by peers and other adults and less so by parents. Is the child high on neuroticism (i.e., emotional instability)? Perhaps the child will react strongly and emotionally to salient religious experiences.

In addition to formalized religious experiences, parents with spiritual or religious commitments may encourage healthy coping. There are a number of mechanisms through which the religiosity or spirituality of a child or of a child's parents could possibly affect a child's physical and emotional well-being. Kliewer and her colleagues (1996) have discussed three theoretical mechanisms by which parents influence children's coping processes, and these can be used to understand how parental spirituality might affect children's well-being. Of course, nonreligious parents also influence their children. The discussion below, however, highlights the ways in which a parent's religiosity or spirituality could affect children's physical and emotional well-being.

First, parents might influence children by *coaching* them to engage in particular ways of thinking about and responding to stressors. That is, parents suggest to children how they might interpret events that occur and suggest options for how they might respond. Although all parents, regardless of their level of religiousness or spirituality, coach their children, parents with spiritual or religious commitments may suggest strategies that tend to encourage more healthy coping (e.g., seeking support, thinking about the situation, forgiving others, prayer) and discourage coping that is less adaptive (e.g., avoidant and

aggressive behavior). For example, in a study of coping socialization with 310 families of late elementary school-age youth, maternal use of religious coping was associated with her active and cognitive restructuring suggestions to her children (Kliewer, Fearnow, & Miller, 1996). Parents also may help their children find meaning in the events that occur to them by suggesting that their children interpret events from a religious viewpoint. This conceptual framework that religious parents can provide actually goes far beyond helping children merely cope with life events. The religious narrative adopted within a family can provide a cognitive scaffold on which the child's worldview might be constructed – having wide-ranging effects on the remainder of the child's life (McAdams, 1996). For example, if parents encourage their children to view the world as under God's control, children may come to view events in their lives as purposeful versus random. If children are taught that humans have free will, then they might interpret their own and others' life choices differently than children who were not socialized to believe in free will.

Parental coaching may apply to physical, as well as emotional, needs. Most religions are associated with a host of pro-health behaviors and discouragement of behaviors that are unhealthy, and religion has been strongly related to longer life even after major confounds (i.e., smoking, drug and alcohol abuse, risky behavior, lifestyle behaviors) have been statistically removed (McCullough, Hoyt, Larson, Koenig, & Thoresen, 2000). Unfortunately, some religions are also associated with biases against outgroups and at times have shown ethnic or other prejudices. Human history has been characterized by a long and unendingly brutal history of wars, and religion (like social class, tribal loyalties, intelligence versus working folks, economics, and sheer lust for power) has been involved in far too many of them, and war can also affect health.

While spirituality might be associated with pro-health lifestyles, the research, at this point, is unclear. Parents who are spiritual might coach their children to engage in healthier habits (e.g., eating right, taking care of one's body, sleeping

enough) than parents who are less spiritual. Evidence for this possible association comes from a meta-analysis showing that religion/spirituality in adults was associated with less alcohol and illicit drug use and with fewer negative mental health outcomes (Koenig, 2001). In addition, recent results of one small qualitative study suggest that girls may have attitudes about sexuality more similar to their mothers' when mothers and daughters discuss sexuality and spirituality with each other and when mothers value their daughters having a strong relationship with God which influences their actions (Baier & Wampler, 2008).

The spiritual and religious values of parents undergird the coaching messages they relay to their children. For example, in a meta-analytic review of religion in the home, Mahoney, Pargament, Tarakeshwar, and Swank (2001) found that more parent religiousness was linked to greater positivity in family relationships. In a study of 90 rural African American families with 9- to 12-year-old children, self-report and observational data revealed that greater parent religiosity was associated with more cohesive family relationships, lower levels of interparental conflict, and fewer externalizing and internalizing problems in the adolescents. There was also some evidence that formal parent religiosity indirectly influenced youth self-regulation via family cohesion and low levels of interparental conflict (Brody, Stoneman, & Flor, 1996). Gunnoe, Hetherington, and Reiss (1999) in a study of parental religiosity, parenting style and adolescent social responsibility that parental religiosity was positively related to authoritative parenting (coded from an interaction task) and maternal religiosity were negatively associated with authoritarian parenting. Parental religiosity had direct and indirect effects on youth's social responsibility.

Second, parents might influence children through *modeling*. Parents who are spiritually or religiously committed may be more likely than parents who are not to cope adaptively with life stressors (e.g., seek support, pray, forgive others, take action to solve the problem, not turn to drugs or alcohol) and to take good care of their own physical needs (e.g., eat right, exercise, have regular medical care). For adults, strong and

replicable intercorrelations have been found between religious measures and positive health behaviors (Lawler-Row & Elliott, 2009). In addition, parents with religious or spiritual commitments might be more likely than other parents to model prosocial behavior in the community (again, virtually all the research has been on religion, not spirituality). Children observe their parents' behavior and imitate them, particularly when they are young. As parents participate in activities that lead to enhanced physical and emotional well-being and that foster community connectedness, children might be encouraged to do likewise. Furthermore, by coping adaptively and taking care of themselves, parents who are religious or spiritual may enjoy better physical and emotional adjustment, which enables them to be more effective at attending to their children's needs. Evidence suggests that religious/spiritual adults enjoy better physical health and are happier than less religious/spiritual people (Green & Elliott, 2010). Parents who are spiritually committed may be more intentional about modeling particular ways of coping – specifically spiritually focused coping and interacting with the community to their children than other parents (Kliewer et al., 1996).

Third, parents might influence children by creating a *context* in which behaviors are learned and enacted. Parents are architects of the home environment. The extent to which the home is a safe haven in which family members communicate and care about one another is largely the responsibility of adults in the home. Parental spirituality and religious commitment might affect the context in which children are raised in a myriad of ways depending on their beliefs. For example, if parents have the financial means, spiritual parents may locate in environments that are less toxic (e.g., less crime ridden or less value discrepant). If parents have little choice about where they live, they may invest in creating what they consider to be safe and healthy environments within the confines of their home. As another example, parents with religious commitments might be more likely to invest in their child's development and have more effective parenting styles than less religious parents.

For instance, spiritual or religious parents may be more loving and accepting of and less hostile toward their children, more likely to establish boundaries that provide security, and more able to provide support to their children. On the other hand, spiritual or religious parents might also have some prejudices or harmful beliefs that are associated with their religious or secular spiritual beliefs. Those too might be likely to be transmitted to children. At present, there is little empirical evidence that bears on these hypotheses.

In addition to parental influences, children's own spirituality may influence their well-being in several ways. First, children's religiosity may provide them with a sense of support, either from God or from members of a religious community to which they belong (Smith, 2003). This support may buffer children from stressors by enhancing their sense of control or esteem or bolstering their connections with others (Sandler, Miller, Short, & Wolchik, 1989). Second, children who are spiritual (who understand and engage in the "search for the sacred" themselves) might be more likely than children who are not spiritual to exhibit traits such as respect for authority and community that will encourage them to follow the prescriptions and example of their parents and communities. The interaction between the child's personal religious or nonreligious spirituality and his or her community's religious or nonreligious spirituality further encourages positive behaviors that lead to healthy outcomes. Thus, a child's religion or spirituality might act as a protective factor by encouraging and fostering healthy behaviors, which in turn serve as additional protective factors, even in the face of difficult cultural, environmental, or personal situations (Smith, 2003). Third, a child's religion or spirituality may provide him or her with a sense of coherence or meaning, which can assist with coping with difficult situations.

## Research

The exploration of religion and spirituality in childhood remains in its infancy despite

increased calls from researchers over the past 10 years to determine how spiritual development emerges in childhood (e.g., Benson et al., 2003). A special issue of *Child and Adolescent Psychiatric Clinics of North America* in 2004 addressed the “new frontier” of religion and spirituality in child and adolescent mental health in which they called for researchers and clinicians to consider religion and spirituality in the provision of mental health care to children, adolescents, and their families. Despite these calls to researchers and as noted above, there is limited evidence linking parent or child *spirituality or religiosity* to children’s well-being. However, there is evidence indicating that parental spirituality within their religiosity affects marital adjustment and parenting behavior (Desrosiers, Kelley, & Miller, 2011), that individual and community spirituality foster a sense of support (Smith, 2003), that children who live in religious environments tend to adopt the religious beliefs and customs of their community (Kelley & DeGraaf, 1997), and that the sense of meaning children gain from this religious organization and rituals acts as a protective factor (Park, 2010).

Building on previous work that demonstrated support for the link between parental religiosity and child adjustment, Christian and Barbarin (2001) examined the impact of parental religiosity on parent reports of child behavior problems in a sample of low-income, African American families. Parents who attended church regularly reported fewer problems with oppositional behavior, peer conflict, depression, headstrong behaviors, and immaturity in their children than parents who attended church infrequently. Data from Christian and Barbarin’s community sample also suggest the support of a church community may strengthen the child’s perception of their parents’ authority and may induce children to be more compliant (Christian & Barbarin, 2001).

While a multitude of studies have established the relation between happiness and spirituality and religiousness in adolescents and adults, there have been few empirical investigations on this relation in children (see Diener and Biswas-Diener (2008), for a review). Holder, Coleman, and Wallace (2010) recently assessed 320 children attending

public and private schools in order to explain this association in children. For children ages 8–12, spirituality was more strongly linked to happiness than was religious practice (e.g., attending church, praying, and meditating). Spirituality accounted for up to 26 % of the unique variance in children’s happiness even when controlling for the variance in happiness associated with temperament, while religious practice accounted for no greater than 1 % of the variance depending on how happiness was assessed. The authors suggest that the lack of a strong relation between religious practice and happiness among children is that parents, not the children, determine the frequency of religious activities.

The limited research on the mental health impact of religion and spirituality in childhood has for most part examined only Caucasian or African American samples. In efforts to enhance our understanding of religion and spirituality in diverse groups of children, Van Dyke, Glenwick, Cecero, and Kim (2009) examined the relation of religious coping and spirituality to adjustment and psychological distress in a sample of primarily Hispanic, urban youth ages 11–14. They revealed that both positive religious coping and daily spiritual experiences were associated with positive affect and life satisfaction. Additionally, they found that negative religious coping (i.e., reframing negative life events as punishments from God, seeking but not receiving congregational social support, experiencing spiritual discontent or conflict, and passively deferring responsibility for oneself and one’s situation to God) was related to higher levels of depression, anxiety, somatization, and negative affect. Van Dyke et al. (2009) also examined the results by grade level to identify any age differences in the impact of religious coping. For sixth graders, higher levels of positive religious coping were associated with lower levels of negative affect. Additionally, sixth-grade youth reporting higher levels of negative religious coping also endorsed higher levels of anxiety. Among seventh graders only, higher levels of negative religious coping were associated with both higher levels of depression and lower levels of life satisfaction. Both sixth and seventh graders demonstrated



a significant positive correlation between negative religious coping and overall psychological distress. When examined separately, eighth graders did not demonstrate significant associations between religious coping and psychological outcomes suggesting that as children enter adolescence they may develop other mechanisms for managing emotions and stress which results in less reliance on religion (Van Dyke et al., 2009).

Given that prior research has linked disparities in parent and adolescent religiosity to youth adjustment (Pearce & Haynie, 2004), Davis and Epkins (2009) sought to explain the process by which family conflict has an impact on preadolescents' depressive and anxiety symptoms by assessing whether private religious practices, such as prayer at meals, meditation, and reading religious material, moderated this relation in a sample of 11- and 12-year-olds. While youths' private religious practices were not directly related to symptomatology, they did reveal that private religious practices moderated the relation between family conflict and youths' depressive and anxiety symptoms. Specifically, they found that the associations between family conflict and depression and anxiety symptoms were significantly stronger for those youth low, versus high, in the private religious practices. David and Epkins asserted that youth who partake in regular private religious practices may be more resilient to the impact of family conflict than youth who do not engage in such activities on a frequent basis.

Finally, Garbarino (1999b) argues that not only is children's spirituality a protective factor against potentially negative outcomes, but also negative events themselves spur children toward greater spirituality. In extensive work with children in difficult circumstances, from the horrors of war to the struggle of poverty, Garbarino observed that trauma can create in some children a desire for answers that leads to a spiritual quest. This search for meaning in response to a traumatic event will often lead to personal growth and answers that allow for better functioning later in life. Expanding on previous work by Garbarino (2007) demonstrated that engagement in religious practices, such as prayer and participating in organized religious activities,

was protective for African American children who were exposed to community violence. Specifically, she found that for children who engaged in religious practices less frequently, increases in exposure to community violence were associated with increases in post-traumatic stress disorder (PTSD) while increases in exposure were unrelated to increases in PTSD for children who engaged in more frequent religious practices.

### **Strategies That Work**

The extant literature is silent when it comes to proven ways of enhancing children's health through religiosity or spirituality. Although there is adequate correlational evidence linking parent and child religiosity and parent religiosity and well-being, there have been no longitudinal studies documenting how change in a child's religiosity or spirituality affects well-being nor studies documenting the efficacy of attempts to enhance child religiosity or spirituality.

### **Strategies That Are Promising**

In contrast to the above, there is much correlational and clinical evidence to suggest that encouraging children to explore the spiritual and their religious context and institution has beneficial effects. The literature documents robust associations between parental spirituality and religious commitment and better parental well-being, greater family cohesion and marital harmony, and more positive parenting techniques (e.g., Bartkowski, Xu, & Levin, 2008; Desrosiers et al., 2011; Wilcox, 2002). Further, children's religiosity and spirituality is linked to better adjustment. Given these associations, a viable avenue to promoting health in preadolescents seems to be promoting religiosity and spirituality in children or parents who desire to become more spiritual or religious (or both). Obviously, it would be a moral and ethical transgression for professionals to conduct a religious or spiritual intervention on people who do not give informed consent or who are coerced to accept a religious

intervention. The “how” by which one (such as a parent, church worker, or professional working consistently with a parents’ bidding) might intentionally promote increased religion or spirituality among normally developing children has not been explored much empirically, and we offer some places to begin in our synthesis section.

Much of work that has shown children to demonstrate religious spirituality and that has advocated religious or spiritual interventions for children has emanated from studies of children facing trauma, including serious illness and potential death. Parents and caregivers can play an important role in fostering spiritual development in children who are confronting these types of stressors. Professionals can intervene more tentatively and only after informed consent. One stressor can serve as an example; children with cancer have unique spiritual needs. Hart and Schneider (1997) encourage oncology nurses to enact interventions that assist children with cancer in finding meaning and purpose in life, continuing relationships, and transcending beyond the self. Finally, as Garbarino (1999b) has noted that exposure to trauma is often the impetus for children to begin seeking meaning for the events that they have observed or experienced. As adults are sensitized to this tendency, they can aid children in their quest for answers. Furthermore, Garbarino (1999a) notes that spiritual exploration is one of the factors that contributes to the success of “lost boys” – boys who have turned to violence, substance use, and other behaviors that compromise their well-being. Because spiritual exploration contributes to success, Garbarino argues that spiritual literacy – for example, exposure to religious texts and practices like meditation and prayer – should be part of educational programs for boys at risk. Once this spiritual foundation is in place, then traditional intervention strategies (educational programs, vocational experiences, counseling, or psychotherapy) can help children move to a more positive life path.

The importance of incorporating children’s religious and spiritual beliefs in psychological interventions has become more increasingly evident. Walker and colleagues (Walker, Reese, Hughes, & Troskie, 2010) recently presented

a model for assessing and incorporating religion and spirituality in the treatment of childhood physical and sexual abuse. They provide guidance on how clinicians can integrate a child’s preexisting religious and spiritual functioning as well as changes in religion and spirituality after abuse in the provision of trauma-focused cognitive behavior therapy (TF-CBT), the most empirically supported treatment for childhood physical and sexual abuse (see Cohen, Mannarino, Deblinger, and Berliner (2009) for a detailed explanation of this treatment). While Walker et al. (2010) focus on how religion and spirituality can be incorporated into treatments for childhood physical and sexual abuse, children who have experienced other traumas (e.g., war, natural disaster, terrorism) which have an impact on their beliefs and worldview may also benefit from the inclusion of their religious and spiritual beliefs in treatment. Additionally, religion and spirituality should be considered as a necessary area of assessment during the treatment planning for children participating in other evidenced-based treatments for mental health problems.

### **Strategies That Do Not Work**

Some strategies do not appear to promote children’s health via spirituality or religious beliefs. There is little evidence that religious school for elementary school children affects their religious development (Greeley & Gockel, 1971). What parents coach and model is much more relevant to preadolescents’ spiritual development.

Harsh parenting practices likely impede the development of childhood spirituality (Larzelere, 1998). In fact, ineffective discipline and low emotional support each contributes to generally poor child outcomes and specifically to children who might respond poorly to God because they might identify God with parents.

### **Summary**

In this section, we offer our own views on the best mechanisms to promote children’s health through

religiosity and spirituality. We believe a primary strategy that would likely promote children's religiosity and spirituality is to assist parents (who wish to do so) in developing religious values and commitments themselves. This recommendation is based on cross-national evidence showing that children, particularly children who reside in less religious nations, are strongly influenced by family religiosity (Kelley & DeGraaf, 1997). Furthermore, a study of how religious beliefs and actions are passed along to children documented the importance of family context in transmitting family values (Myers, 1996). In that study, several factors aided in the transmission of religiosity to children: parental religiosity, parental marital happiness, parent-child support, moderate strictness, and a traditional family structure. Thus, it is important to note that parental religious and spiritual commitments cannot be divorced from other aspects of parenting in order to promote health in children.

As part of a strategy to enhance children's health through religiosity and spirituality, parents should be encouraged to coach children to (a) look for meaning in events that happen to them using developmentally appropriate concepts (Park, 2010), (b) help children recognize they have coping resources that are outside of their own capabilities (Pargament, 1997), and (c) use religious coping strategies when appropriate. Two particularly important coping mechanisms are prayer and forgiveness. Wachholtz and Sambamoorthi (2011) studied national trends in the use of prayer to cope with health concerns. Generally, prayer was an effective coping mechanism and its use appears to have risen substantially within the last ten years. In addition, forgiveness is likely to be related to the connection between religion and spirituality and health as a moderator and mediator (for a review and model, see Worthington et al. (2012); for a review, see Worthington, Witvliet, Pietrini, and Miller (2007)). Many family researchers argue that good family relationships are those in which family members can form, maintain, grow, and repair when damaged the emotional bonds. Forgiveness is one primary way that people repair damaged relationship bonds. Parents should also

be encouraged to teach their children directly about God and other religious concepts that are a part of their worldview.

In addition to coaching, parents should be encouraged to *model* their religious commitments and values in their own pursuit of what is sacred; the way they cope with their own stresses; and in how they interact with people, inside and outside of the home. For example, if parents want their children to be prayerful, they will be most effective if they both encourage their children to pray and model praying. If parents want their children to be forgiving, they should model seeking and giving forgiveness. The values that are core to their religious and spiritual commitments should be reflected in daily interactions with others around them.

Religious routines and family activities that are consistent with parents' religious values should also be encouraged in parents. Children gain security and a sense of control from routines (Boyce, Jensen, James, & Peacock, 1983), which provide children with a sense of security but also help them to develop spiritual habits that can be built on as children mature and begin to explore their own spiritual values. Engaging in activities as a family that enacts parental values, such as serving the community, is also a way to actively transmit spiritual values to children.

A second strategy to strengthen children's health and mental health through promoting children's spirituality and religion is to encourage parents to commit themselves to a faith community. There are benefits to children of belonging to a faith community that are different from merely having parents with a strong religious or spiritual commitment. Communities of faith can reinforce what parents are trying to communicate to their children about spiritual issues, provide emotional and instrumental support for children (Smith, 2003), and act a buffer between parents and children when parents are undergoing a lot of stress. Faith communities may also provide a sense of working together for a common goal. Health can be affected through (a) affecting children's health behaviors, (b) providing increased social support, and (c) reducing risky health-compromising behaviors.

A third strategy that would likely promote children's spirituality is to encourage children to develop friendships with other children who have spiritual and religious sensitivities. Research shows that while parents remain important in children's lives as they enter adolescence, peers gain influence (Harris, 1998). If children interact with peers who support, rather than denigrate religion, children may be more likely to engage in religious behaviors, perhaps including the personal search for the sacred. This suggestion is slightly different than strategy two. Children can be members of a faith community without having close friends or peers in that community.

A fourth strategy that would likely promote children's spirituality is to directly encourage children to explore these issues, independent of parental religious or spiritual commitment. Webster (1998) has advocated using stories, poetry, and art in the context of the educational system to foster spirituality through promoting narrative and emotional connections between life and meaning. Webster's ideas might be incorporated into the curriculum of youth organizations (e.g., Boy Scouts, Girl Scouts, 4-H) or after-school programs (e.g., Boys and Girls clubs).

In summary, there is evidence that parental spiritual and/or religious commitments are associated with a child's religious beliefs and actions and to a lesser degree spirituality. Furthermore, religion and spirituality are protective for children. While the efficacy of interventions to enhance children's religiosity and spirituality is unknown, research from the parenting literature suggests that encouraging parents to develop spiritual and religious commitments themselves, to become involved with a faith community, and to encourage their children to interact with peers who have spiritual interests will help foster religious and spiritual development and perhaps physical and mental health. Also, directly encouraging children to explore the sacred, either as a part of educational or extracurricular activities or in response to trauma, illness, or poor life choices, may promote spiritual development. Research is needed that critically evaluates these efforts in awakening children to religious and spiritual possibilities.

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## Resiliency During Early Childhood

Lennis G. Echterling and Anne Stewart  
Department of Graduate Psychology, James  
Madison University, Harrisonburg, VA, USA

### Introduction

There has been a great deal of recent attention on resiliency in the primary prevention and health promotion literature, but most studies and programs have focused on school-aged children, adolescents, or adults. Less attention has been given to promotion of resiliency in early childhood. Nevertheless, there are promising trends in both relevant research and practice. This entry explores the promotion of resiliency in young children, including infants, toddlers, and preschoolers. The fundamental assumption behind these interventions is that it capitalizes on the opportunity to promote positive trajectories of growth and development by actualizing the strengths and resources of young children for successfully coping with adversities.

### Definitions and Scope

Resiliency is derived from the Latin word *resilire*. To resile literally means to bounce back, rebound, or resume shape after compression. The concept was originally applied to physics, in which resiliency refers to the elastic strain energy of material. Ecologists, political scientists, and economists have also found productive ways to apply the concept of resiliency to their fields. Since the 1970s, primary prevention and health promotion researchers and practitioners have taken the notion of resiliency and applied it metaphorically to characterize the ability of a child to bounce back after enduring the strain of adverse, or even traumatic, events (Masten, 2001).

The concept of resiliency has provided a promising conceptual framework, particularly in the areas of primary prevention and health

promotion. Instead of concentrating on identifying the psychological casualties of harsh conditions and traumas, many researchers now are studying how children can achieve their developmental potential and flourish under fire. As a consequence of this focus on strengths and resources, the study of resiliency in children already has overturned many negative assumptions about their readiness and ability to cope with adversity. Adding momentum to this emphasis on resiliency, many researchers and practitioners have been endorsing positive psychology, a recent conceptual shift in the field (Donaldson, Csikszentmihalyi, & Nakamura, 2011).

### Theories

Some early theorists of resiliency conceptualized it as an innate personality trait that characterized those rare children who withstood seemingly overwhelming stressors. Several scholars used such terms as “invincible” to portray such children (Werner & Smith, 1982). Theorists proposed that these resilient individuals had identifying personality traits, such as self-efficacy, self-esteem, autonomy, temperament, and positive emotionality. The assumption of this conceptualization was that a few extraordinary children have stable and generalized dispositions that make them consistently resilient across all situations and virtually throughout their lives. Resiliency was a quality that emanated from within these exceptional children.

Although researchers have found links between personality characteristics and childhood resiliency, critics of this perspective have expressed concerns and identified several limitations of this theoretical perspective. First, grandiose labels, such as invincible, suggested that these children came through all adversities, including catastrophic events, virtually unscathed and untroubled. This characterization proved to be highly inaccurate and an unfortunate stereotype. Second, the narrow focus on personality failed to acknowledge the vital roles that a child’s relationships and environment can play in promoting resiliency. Third, the theorists

assumed that personality traits were preceding factors that led to resiliency, but many studies have documented that an experience of coping successfully with a challenge can actually enhance such traits as optimism, self-efficacy, and positive emotionality. In other words, resiliency is not a static personality trait, but a complex, systemic, dynamic, and reciprocal process (Masten, 2001).

Some theorists have defined resiliency as the ability to recover from a trauma without developing any psychopathology, such as posttraumatic stress disorder (PTSD) or clinical depression. Resiliency, therefore, is the absence of any psychological disorder following a significant stressor or crisis event – to *resile* psychologically is to *survive* by recovering from a trauma and returning to a state of normal functioning without pathology (Bonanno, Galea, Bucciarelli, & Vlahov, 2006). Other scholars have pointed out that the primary limitation of this conceptualization of resiliency is that it is defined by the absence, rather than the presence, of a condition. Just as wellness is much more than merely the absence of illness, the notion of resiliency suggests a more positive, nuanced, and complex construct.

A number of recent theorists are conceptualizing resiliency as a process of overcoming adversity to achieve a positive transformation and transcendence. Resiliency is more than merely coping with harsh circumstances and surviving them to return to the previous level of functioning. Instead, children have the potential to achieve posttraumatic growth (PTG) (Calhoun & Tedeschi, 2006). Ultimately, from this perspective, resiliency is the process of young survivors emerging from adverse conditions to become thrivers in their lives.

## Research

Research has documented a remarkable level of resiliency in children across cultures and under a variety of adversities, including traumatic and catastrophic events, such as disasters and acts of terrorism (Watson, Brymer, & Bonanno, 2011).

Resiliency researchers have discovered that many young children are surprisingly robust, thriving under difficult chronic conditions, including extreme poverty, family violence, institutional settings, and prejudice (Masten & Reed, 2002). The research consistently has found that the majority of children who experienced specific traumas, such as sexual assault and death of a parent, do not develop psychiatric disorders. Resiliency, in fact, is the rule, rather than the exception (Ryff & Singer, 2003). Life history studies of psychological well-being provide compelling evidence for the resiliency of most – not just a few – children in the face of adversity. Researchers have investigated both those who have directly confronted traumas and those who are indirectly involved – witnesses, relatives, and friends. Their findings have consistently demonstrated that the overwhelming majority of survivors overcome catastrophes and other adversities (McNally, Bryant, & Ehlers, 2003). Sapienza and Masten (2011) are encouraging researchers to explore the neuroscience of resilience and resilience-related processes of interaction that impact individuals across system levels, from genetic to neural, to behavioral and social levels. Using this perspective, they believe we may document the progressive, cumulative effects of nonlinear change, termed developmental cascades, not of risk, but of resilience, moving across systems.

Over four decades, hundreds of studies on the process of resiliency have consistently identified four general factors that promote resiliency among children. These factors include supportive caregivers, meaning making, effective regulation of emotional arousal, and coping abilities.

### Supportive Caregivers

Resilient children are not islands unto themselves. Instead, their lives are interwoven in an intricate tapestry of relationships that nurture, protect, enliven, and enrich them. Social support in general has been demonstrated to be a powerful factor for promoting resiliency. In particular, supportive caregivers provide buffers to the inevitable crises, adversities, and challenges of life that the vast majority of children

face. Resiliency evolves from these dynamic everyday interactions within the caregiver-child relationship (Papoušek, 2011). Researchers working within the framework of attachment theory have been particularly productive in documenting that the quality of the relationship between caregiver and child during the first years of life is central to a child's resiliency. In particular, the mother-child relationship has been found not only to buffer the impact of socioeconomic stressors but also to promote the resiliency of young children (Malmberg & Flouri, 2011).

Complementing an attachment perspective are other characteristics of successful caregiver-child relationships. These include using a developmental perspective, accurately reading and responding to the child's needs, conveying positive and clear expectations for performance and behavior, providing frequent and constructive feedback, recognizing the power differential, and, most importantly, acknowledging the reciprocal and dynamic *relationship* as the focus.

Typically and ideally, caregivers gradually learn to concentrate effective displays when baby is attending to them and enable the dyad to develop an interactional synchrony, the smooth intermeshing of behaviors. The degree to which babies trust or have faith in the reliability of their caregivers' abilities impacts the security and quality of future relationships between the children and their environment (Lamb, Ketterlinus, & Fracasso, 1992). Importantly, this initial tie to one's caregiver is the formative relationship in the course of which the infant develops a sense of self (Klaus & Kennell, 1982). Thus, early caregiver-infant interactions are important as a foundation for the infant's social and emotional development (Ainsworth et al., 1978) and the overall quality of the caregiver-infant relationship.

### Meaning Making

Humans are the only meaning-making species, but psychology has practically ignored the subject of human meaning. Meaning making is the process of giving narrative form to raw experience, gaining cognitive mastery, and discovering possible resolutions (Echterling & Stewart,

2008). Children make meaning in a variety of ways, such as playing, reenacting, drawing, and telling stories. The meaning that children create does more than organize their life experiences. It affirms fundamental beliefs, guides important decisions, and offers comfort in times of distress. Even though they have confronted traumas as children, adults who lead meaningful lives have greater satisfaction, experience more positive emotions, and evidence greater vitality (Emmons, 2003). Although young children have limited abilities to verbalize the complexities of their experiences, especially with adversities and traumas, they nevertheless give expression to these experiences through a variety of creative ways, such as drawing, reenacting and playing, to gain some sense of cognitive mastery over the adversity (Echterling & Stewart, 2008). Furthermore, particularly with young children, much of the meaning-making process takes place in the relationship with the caregiver. Through attunement, the responsive caregiver accurately reflects the child's attempts to give form to their raw experiences.

Closely related to meaning making and cognitive mastery, numerous studies in the emerging field of social neuropsychology have documented the neuroplasticity of brains, especially those of young children. The ability to create new neural pathways following an insult or trauma is a testimonial to the resilience of the brain. Moreover, there is substantial evidence that the brain is a social organ. As a consequence, the process of interacting with caregivers activates and transforms the neural networks of infants and toddlers (Cozolino, 2010). As the young child's brain continues to mature, the social interactions with adult caregivers provide countless opportunities for optimal brain development, adaptive neural pathways, and integrated brain systems. Consistent and regular attunement between caregiver and child is vital in this process by not only strengthening interpersonal bonds but also providing a rich, fertile environment for optimal brain development (Cozolino, 2010). Ideal relationships with their caregivers offer infants and toddlers both a safe haven of security and countless stimulating opportunities to explore their world.

### Regulatory Capacity

The study of human emotions, for the most part, has been a study of negative feelings. Recently, researchers are turning their attention to positive emotions (e.g., Frederickson, 2002). They see positive emotions as a frontier of uncharted territory that holds vast potential for primary prevention and promotion interventions. Adversity is a time of intense emotions, but a common assumption is that children enduring harsh circumstances experience only negative feelings, such as fear, shock, and grief. Children actually experience not only painful reactions but also feelings of resolve, such as courage, compassion, and hope (Snyder et al., 1997).

Similar to the process of meaning making, young children achieve their potential for richer and more sophisticated emotional regulation through their encounters with an attuned caregiver. During interactions, the adult develops sensitivities to the infant's intricate set of behavior cues, comforting, protecting, and helping the child organize feelings. This dance of co-regulation persists over countless small but significant everyday exchanges which in turn enable the infant to begin to learn to regulate his or her emotions. Caregivers must learn to identify, respect, and scaffold their infants' developing regulatory capacity. Over time, the young child develops an expectation that there will be a caring adult, responding in a contingent, helpful way. This attunement promotes important factors that engender resiliency. First, the caregiver's empathy sensitizes the adult to the wonder and magic of the infant's world. Consequently, both adult and infant share in the small miracles and joys, increasing the number of shared positive emotions. Second, the caregiver's responsiveness to distress signals provides countless opportunities for the young child to begin to understand the role that emotions play in relationships and to practice emotional regulation.

Besides expressing their feelings in more productive ways, resilient young children learn to use other strategies to manage their emotions. These strategies include bringing their needs to caregivers, redirecting their attention, relying

on others for support, reframing the events, and beginning to take the perspective of others.

### Successful Coping

In general, research on children's coping strategies have found that problem-focused, active coping – although unsophisticated and seemingly simplistic compared to older children – leads to greater resiliency. On the other hand, avoidant coping tends to be negatively associated with resiliency (Compas et al., 2001).

Rituals and routines provide young children, families, and communities a way to affirm their identity and celebrate their roots. In a young child's family, he or she learns to identify and savor customs that offer structure, meaning, and connectivity. In times of adversity, parents can design new rituals and routines that safeguard, as much as possible, the sense of safety and security while accommodating the new circumstances.

### Strategies

The most successful interventions appear to recognize the need for interprofessional collaboration in both research and practice. The promotion of resiliency in young children benefits greatly when educators, parents, anthropologists, health professionals, epidemiologists, cognitive scientists, policy makers, and community leaders work together to assess needs, plan interventions, implement programs, and carefully evaluate their effectiveness. A second strategy is to remain committed to intensive, comprehensive, and interactive interventions. Although there are tremendous needs, the most effective programs are those that are firmly based on a solid theoretical foundation, informed by the research, clearly described in manuals, and implemented by well-trained and supervised practitioners. Finally, both research and practice benefit greatly by drawing on Bronfenbrenner's (1979) ecological systems theory to appreciate the complex, dynamic, and broad factors that can contribute to the resiliency of young children.

## What Works

It is important to keep in mind that although the programs described below have been demonstrated to be effective interventions for the promotion of resiliency, practitioners also use them to prevent specific problems, such as disruptive behaviors. Furthermore, many therapists rely on these interventions as treatment strategies. The protocols for these interventions require varying amounts of training, but the concepts and methods they include reflect vital aspects for promoting resilience, namely, supporting healthy caregiver-child attachment relationships, decreasing problematic behaviors, and creating responsive caregiver-child interactions. The reader is encouraged to explore ways to incorporate dimensions of resilience in their clinical work and to continue professional development to acquire the knowledge and skills needed to design and implement effective treatments. The evidence-based interventions are Circle of Security, Incredible Years Parent Training Program, Parent-child Interaction Therapy, and Child-Parent Psychotherapy.

### Circle of Security

Circle of Security (COS) is an intervention based on attachment theory and research. The fundamental goal of the intervention is to enhance the attachment relationships between caregivers and their young children. The COS interventions may be delivered as individual therapy, intensive in-home treatment, or as a psychoeducational course. The psychoeducational program includes a curriculum that emphasizes how findings from attachment theory and the field of child development can inform parenting practices. A major theme of COS is that young children have sophisticated capabilities to communicate their needs but that foster, adopted, and children with other high-risk patterns may send hard to read and confusing cues about their needs. Therefore, the intervention relies heavily on supporting caregivers as they view multiple videotapes of their interactions with their own and other children. Taking a strengths-based approach, trained course instructors highlight positive moments of

attunement and pleasure that the videotapes capture. Such a strategy not only enhances the motivation of caregivers, it also builds on their successes. The program facilitators also invite caregivers to consider alternative interpretations of their children's subtle behaviors.

Evaluations of this program have found that caregivers become more appropriately responsive to their children's cues for safety and exploration; more able to reflect on their own and their children's thoughts, feelings, and behaviors; and more aware of how their previous experiences affect their current caregiving (Marvin, Cooper, Hoffman, & Powell, 2002). More recently, the COS developers have created effective parenting DVDs that provide educational content and include opportunities for caregivers to reflect on the needs of their own children and the challenges they face in meeting those needs (Cooper, Hoffman, & Powell, 2009). Another study demonstrated the efficacy of the COS intervention in creating more securely attached toddlers with parents in a jail-diversion program (Cassidy et al., 2010).

### Incredible Years Parent Training Program (IY)

The Incredible Years Parent Training Program (IY) (Webster-Stratton & Reid, 2010a) is an empirically supported intervention that takes full advantage of a group format and dynamics. The purpose of the IY program is to strengthen the competencies of parents, who can then be more successful in actualizing their children's potential for resiliency while reducing the risk for future conduct problems, substance abuse, and violence. The IY curriculum topics include positive parenting skills, managing disruptive behavior, and strengthening emotional regulation. During the sessions, the group facilitators present videotaped vignettes, lead discussions, and involve parents in role-plays to practice skills of offering positive attention, encouragement, clear commands, consistent rules, and logical consequences (Webster-Stratton & Reid, 2010b).

A number of randomized studies have shown that IY enhances the competencies of both parents and children, reduces child problem behaviors, and enhances child resiliency (Borden,

Schultz, Herman, & Brooks, 2010). Importantly, the participants have included ethnically diverse and multi-stressed families (Reid, Webster-Stratton, & Baydar, 2004).

### **Child-Parent Psychotherapy**

Child-Parent Psychotherapy (CPP) (Lieberman & Van Horn, 2005) is a therapeutic treatment program that has been demonstrated to be an effective intervention. The primary target populations have been infants and preschoolers of high-risk caregivers, including abusive, depressed, or violent parents. Like other programs influenced by attachment theory, the process of CPP involves enhancing the emotional attunement between parents and young children in order to promote childhood resiliency. CPP also includes such traditional psychotherapeutic techniques as exploring how the parental childhood experiences have had an impact on their current perceptions of, and emotional responses to, their children's behavior. Like other clinicians, CPP interveners invite parents to consider on how they may be distorting the meaning of their children's emotional communications. In sessions that can take place at home or in the office, parents also explore how the stressors of their current life circumstances can impair their ability to be sensitive and nurturing caregivers. The sessions, which are less structured than most other programs, include both the parent and child so that their interactions can become opportunities for reflection, discovery, and behavior change.

The effectiveness of CPP has been demonstrated in randomized clinical trials involving partner violence (Lieberman, Ghosh Ippen, & Van Horn, 2006), depressed mothers (Toth, Rogosch, Manly, & Cicchetti, 2006), and maltreating families (Cicchetti, Rogosch, & Toth, 2006). Associated outcomes for children have included a decrease in PTSD symptoms, fewer behavior problems (Lieberman, Van Horn, & Ghosh Ippen, 2005), and more positive mother-child relationship expectations (Toth, Maughan, Manly, Spagnola, & Cicchetti, 2002). In addition, the percentage of children whose attachment classification changed from insecure

to secure was significantly higher for the PCP intervention group (Toth et al., 2002).

### **Parent-Child Interaction Therapy**

Parent-child Interaction Therapy (PCIT) is a treatment program for young children with conduct disorders that places emphasis on improving the quality of the parent-child relationship. PCIT was developed for children ages 2-7 years with externalizing behavior disorders. PCIT uses a psychoeducational approach, teaching parents specific observation and communication skills to encourage prosocial behavior and reduce negative behavior. PCIT treatment has two phases, focusing on first on child-directed interactions, where the parent follows the child's lead, and then parent-directed interactions, where the parent sets limits and makes age appropriate demands of the child. Outcomes include fewer oppositional and defiant behavior problems and more positive parent-child interactions (Nixon, Sweeney, Erickson & Touyz, 2003).

### **What is Promising**

Promising practices programs have empirical evidence that they are effective but overall have fewer studies completed and/or have not yet conducted randomized studies with control groups (Promising Practice Network, 2011).

### **Video-Based Intervention to Promote Positive Parenting**

The Video-Based Intervention to Promote Positive Parenting is a prevention program which makes extensive and productive use of video recording technology in working with parents of infants. The Video-Based Intervention to Promote Positive Parenting (VIPP) involves a series of four home visits with families (Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2007). Similar to the COS program, VIPP educates caregivers on the principles of infant development and attachment theory. It also videotapes parent-infant interactions in the home for in-depth reviews and reflections. The approach of the intervention is strengths-based and



includes positives goals of helping parents to become more sensitive and nurturing caregivers.

Studies of the effectiveness of this preventive program include interventions with adoptive families (Juffer, Bakermans-Kranenburg, & van IJzendoorn, 2005), parents of highly reactive infants (Klein Velderman, Bakermans-Kranenburg, Juffer, & van IJzendoorn, 2006), and with infants at risk of preschool externalizing behaviors (Klein Velderman et al., 2006).

### **Psychological First Aid**

Psychological First Aid (PFA) shows potential for being an effective early intervention for promoting the resiliency of children and their families following major catastrophic events, such as natural disasters (Brymer et al., 2006). PFA techniques have the basic goals of ensuring safety, attending to practical needs of survivors, offering comfort, reducing distress, enhancing efficacy, and connecting survivors to resources, all of which are empirically supported intervention principles (Hobfoll et al., 2007).

### **Neurosequential Model of Therapeutics**

The Neurosequential Model of Therapeutics (NMT) was designed by Bruce Perry, founder of the Child Trauma Academy. It has been described as a “developmentally-informed, biologically-respectful approach to working with at-risk children” (Child Trauma Academy, 2010). NMT is not a specific intervention; rather, it is a comprehensive method of intervention which guides the practitioner in organizing and conceptualizing a child’s history and current functioning. Practitioners are taught how to structure the assessment process and developmental information, analyze the findings and design therapeutic activities that address the child’s challenges, and capitalizes on their strengths. NMT has three key components – assessment, staffing/training, and recommended therapeutic, educational, and enrichment activities (Perry, 2009). NMT requires active participation from caregivers and other adults in the child’s world. Outcome research is underway in a broad range of clinical and educational settings, including therapeutic foster care, therapeutic preschools, and outpatient treatment.

### **Active Parenting Now**

Active Parenting Now is a parenting program based on Adlerian theory. Parents meet with a program facilitator to view a video and discuss ways to apply the information to challenging child behaviors. The program teaches parents to use encouragement to build self-esteem and to create a relationship with the child based upon active listening, honest communication, and problem solving. Consistent with Adlerian theory, the program also emphasizes the use of natural and logical consequences for misbehavior. Child outcomes for the program show dramatic differences in parent–child relationship and the ratio of positive and negative behaviors exhibited (Pindar, 1994).

### **Play and Expressive Arts Therapy**

Crisis and disaster interveners (Echterling & Stewart, 2008) have developed a variety of play-based techniques to help children give expression to their own resiliency. Indeed child-caregiver play is a component in almost all of the programs discussed. Supporting very young children as they explore their world through play is a powerful, culturally congruent, and developmentally appropriate way to engage and foster all aspects of resilience. Incorporating playful rituals and routines helps children establish and, if needed, regain confidence in the predictability of their world. Using creative activities to tell one’s story offers children an opportunity to begin to give form to raw experience, gain perspective, regulate their emotions, and make important discoveries about their resiliency. Children tell their stories in a variety of ways – talking, drawing, sculpting, singing, writing, and, of course, playing – but whatever form their stories take, the process helps them to create meaning from the adversity.

Similarly, play therapy has been widely used by child and family therapists for children in crisis or with affective, regulatory, and behavioral problems. A meta-analysis of 93 controlled outcome studies assessed the efficacy of play therapy, finding an overall treatment effect for interventions of 0.80 (Bratton, Ray, Rhine & Jones, 2005). Further analysis revealed that

effects were most positive for humanistic treatments and, consistent with other programs for promoting children's well-being, found that using parents in play therapy (filial play therapy) produced the largest effects. Play therapy appeared equally effective across age, gender, and presenting issue.

## What Does Not Work

### Psychological Debriefing

Originally developed as an early intervention for first responders to critical incidents, psychological debriefing techniques have not been found to be effective with survivors of traumatic events. In fact, there is some evidence that suggests that such techniques have been harmful to adult participants of psychological debriefing groups (Brymer et al., 2006). Moreover, the application of such adult interventions that are verbally based to young children appears developmentally inappropriate and should be viewed with caution.

## Summary

As the study of resiliency enters its fifth decade, the questions to be answered will no longer be whether young children are resilient, but how their resiliency can best be promoted. Many researchers are intrigued by these unanswered questions. And many more practitioners are committed to dedicating their efforts to develop evidence-informed interventions that promote resiliency in young children. Focusing on approaches that build on strengths, capitalize on natural resources, and moving beyond psychopathology are only some of the promising beginnings for the promotion of resiliency. Consistent with Bronfenbrenner's ecological model and developmental cascades, interventions that address risks and protective factors at the individual, family, and community level are more likely to result in positive outcomes. Young children are embedded within a broader familial and cultural context, so it is clear that more ethnocultural research is needed to assist

planners in designing programs that resonate with diverse values and worldviews.

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## Resiliency During Childhood

Anna Tielsch-Goddard  
Vanderbilt University, School of Nursing  
Nashville, TN, USA

### Introduction

The study of resilience is just as broad and dynamic as the definition. Resilience can be referred to as a process, an experience, or a characteristic of adaptation to adversity, stress, or tragedy. One of the most famous examples of thriving after facing a series of life's perils is Helen Keller who, armed with protective factors throughout adolescence, despite an array of psychological vulnerability, was able to avoid potential negative outcomes from being deaf and blind at an early age and triumphantly navigate life as an author and public speaker. The term "resilience" is often used when discussing coping or coping strategies and is an essential and fundamental area of study in the field of pediatrics.

The resilience concept, also regarded as "mental hardiness," is the understanding of why some people thrive in circumstances where others have faltered and is a complex and intriguing topic to many. Promoting childhood resilience in order to foster positive developmental outcomes and success into adulthood can provide coping for individuals in challenging situations and has shown to reduce negative mental health consequences and poor emotional outcomes. Pediatric resilience is a multifactorial interaction between risk factors such as a sociocultural influences and individual characteristics and protective factors entailing a diverse interface of individual factors, family, and extrafamilial elements. Most interventions to promote childhood resiliency focus on reducing health risk behaviors and enhancing these protective factors, hence "fostering resilience."

Current research has moved beyond basic definitions and foundations of identifying protective and risk factors and is now focusing on the protective process across all age ranges from

the emerging infant mental health field to the integration of resiliency programs for the school-aged and adolescent child. Successful resilience is often the result of individuals circumnavigating through their environment and overcoming risk factor influences to avoid psychological vulnerability, resulting into a healthy adult construct.

### Definitions and Scope

Disagreement on the operational definition of "resilience" exists across a multidisciplinary review of the term, but the concrete meaning is always the same. The term "resilience" is defined in terms of a skill, personality, an individual trait, or as a psychological concept. "Resilience" is used throughout literature and across multiple disciplines, including psychology, medicine, nursing, and sociology, as a noun, an adjective, and a process and is synchronous with "psychological resilience," "emotional resilience," "hardiness," and "mental resourcefulness." As a compiled definition, resilience is also known as the ability to have positive outcomes or persistent competence while recovering from trauma, high stress, or high-risk situations (Reivich & Shatté, 2002; Resnick, 2000; Werner, 1994). "Resilience" as a term is also used interchangeably within the literature with "protective factors" and "resilient personality."

Risk factors, which are thought to be cumulative, are intrapersonal or environmental factors that are associated with resilience and include poverty or low socioeconomic status, prematurity, difficult temperament, insecure attachment, inconsistent or harsh parenting, parental conflict or divorce, single-parent households, school failure, peer rejection, neighborhood violence, racial discrimination, child abuse or neglect, and external locus of control (Kumpfer, 1999; Rak & Patterson, 1996; Rew & Horner, 2003). Resilient children are thought to be capable of positive coping despite an accumulation of risk factors (Garmezy, 1974; Herrman et al., 2011). Protective factors reduce the impact of risk factors and are correlated to a higher or stronger resiliency.

Protective factors include resourcefulness, healthy birth, calm temperament, secure attachment, warm parenting, family harmony (also known as family cohesiveness), school success, support systems, good neighborhoods, humor, high self-esteem, an internal locus of control, and intelligence (Armstrong, Birnie-Lefcovitch, & Ungar, 2005; Garmezy, Masten, & Tellegen, 1984; Masten, Morrison, Pellegrini, & Tellegen, 1990; Myers & Taylor, 1998; Rutter, 1987).

## Theories

In 1973, epidemiologist Garmezy first published research findings on resilience and initially defined risk and protective factors which are now tools to support the development of resilience (Garmezy, 1973). Garmezy (1974) found that at-risk children raised by mothers with severe mental illness developed normally despite undesirable circumstances. His research led to further understanding of these factors and their correlation to resilience. In the 1980s, the concept of pediatric resilience further gained popularity after research findings of Emmy Werner had further defined family and individual traits that impact childhood resilience. Werner first started using the term “resilience” as she was studying children in Kauai from poor families with either alcoholic or mentally ill parents (Werner & Smith, 1982). She found that two-thirds of the children of these parents exhibited poor outcomes late in life such as unemployment, substance abuse, and teenage pregnancies. However, the other one-third of the children had traits that made them different and were coined the “resilient” group. Werner’s longitudinal studies followed participants from birth to 32 years of age and led to pediatric resilience emerging as a major theoretical framework and area of research for the next 30 years to present day. Werner continued to study pediatric resilience protective factors and contributed to over 40 years of research concluding that “one caring adult in a child’s life” is one of the most critical protective factors (Werner, 1994; Werner & Smith, 1982; Werner & Smith, 1992).

Protective factors became a major investigative focus in order to help explain adaptation to adverse conditions with positive outcomes. Longitudinal studies have since shown the importance of different personality factors, or intrinsic factors, within an individual (Garmezy et al., 1984; Werner, 1994; Werner & Smith, 1982). Consensus among major theories and scientific school of thought maintains that resilient children will share similar traits; including an active approach toward problem-solving, an ability to gain positive attention, an optimistic view of experiences (even in tragedy), a positive goal-setting mentality, and the ability to be autonomous; seek out novel experiences; and have a proactive perspective (Garmezy et al., 1984; Kumpfer, 1999; Rak & Patterson, 1996; Reivich & Shatté, 2002). A further look into childhood protective factors reveals the concept of protective resources which further modify the child’s response to adverse outcomes and include competence (which includes social skills, scholastic and physical ability, and a sense of self-worth), positive coping styles, a sense of humor, connectedness with caring parents or adults (also referred to as external support perception), and knowledge of health behaviors and risks (Garmezy & Masten, 1991; Herrenkohl, Herrenkohl, & Egolf, 1994; Resnick, 2000; Rew & Horner, 2003).

Renowned researcher Ann Masten, Ph.D. (1989) demonstrated the importance of parental caregiving as a major component of resilience in her work with schizophrenic mothers. Environmental components in one’s life have since been well recognized as a significant impact on resiliency in pediatrics. Role models outside the family have been found to act as “buffers” for vulnerable children and may include teachers, school counselors, coordinators or instructors of after-school programs, coaches, mental health workers, and neighbors (Beadsless & Podorefsky, 1988; Dugan & Coles, 1989; Rak & Patterson, 1996).

The “self-concept” plays a major role across the resiliency literature referring to the capacity to understand the self and self-boundaries in relation to long-term family stressors like psychological illness, positive self-esteem, and the



ability to cope with stress and tragedy (Beadsless & Podorefsky, 1988; Rak & Patterson, 1996). Werner (1994, p. 71) best explains self-concept in resilient children as “contribution to their effective coping appeared to be a feeling of confidence or faith that things will work out as well as can be reasonably expected, and that odds can be surmounted.”

The Resilience Framework is a well-accepted, now international, theory identifying major resilience processes into three major categories: first, the individual characteristics of resilience such as the child’s personal strengths; second, the environmental or community precursors (which are also referred to as risk and protective factors as they relate to resilience); and finally, the family construct or interpersonal dynamic (Kumpfer, 1999). Building on prior universally accepted social ecology, this metatheory focuses on caretakers using different socialization processes to improve their child’s resiliency characteristics into five different resilience areas: (1) Spiritual, by supporting the development of talents, goal-oriented self-esteem, knowledge, and academic skills; (2) cognitive, by developing self-esteem and providing knowledge and academic skills; (3) behavioral, through modeling, coaching, and reinforcing behavioral competence; (4) emotional, by reflecting feelings, modeling, and reinforcing management of emotions; and (5) Physical, by teaching and reinforcing good health and healthy choices (Kumpfer).

## Current Research

The current research in pediatric resilience is as broad as the concept and definition. Up-to-date research ranges from looking at resiliency factors in high-risk youth, environmental components of resilience, resiliency promotion in the child with a chronic condition to the neurobiological and genetic confounds of resilience. A current shift in research involving resiliency programs has moved from the creation and presentation of intervention programs to the promotion of resilience across different youth genres and

analysis of the reproducibility, validity, and reliability of these programs.

Following the constructs formed by the early theorists of pediatric resilience, an outburst of intervention programs began to emerge, while researchers are now focusing on statistically significant results of these programs to further prevent psychological vulnerability. Researchers are looking at protective and risk factors of resilience among different genders, twin studies, divorce, single-parent households, and socioeconomic statuses as both pilot and repetitive studies looking at promotion interventions (Bowes, Maughan, Caspi, Moffitt, & Arseneault, 2010; Gillham & Reivich, 2011; Greenberg, 2006; Reivich & Shatté, 2002). Some research focuses on single components of resiliency, while others take a multifaceted approach to the constructs of resilience.

Interventions beginning in utero and immediately postnatal have shown promising results in resiliency promotion. For example, in a population of low socioeconomic status, single, unwed mothers receiving prenatal care, social support, and behavioral interventions found that the infants had superior mental capacity when there was a resilience protective measure against maternal stress (Olds, Sadler, & Kitzman, 2007; Ozbay, Fitterling, Chamey, & Southwick, 2008). Maternal nutrition in pregnancy, avoidance of maternal smoking and alcohol consumption, maternal social support, and access to prenatal and antenatal care have now been proven as effective strategies in the earliest years of pediatric development to build resilience later in life (Newman, 2004).

Important to note is the recent surge of investigators linking resilience factors and resiliency beyond the environmental components and recognizing psychobiological contributing factors. The role of individual development (ontogeny) and evolutionary development (phylogeny) appears to play a major role in resilience that is not yet entirely understood (Stein, 2009). Early developmental in utero and postnatal environments affect the developing neurobiological system affecting brain size, neural networks, receptor sensitivity, and neurotransmitter synthesis and reuptake that can later reduce

vulnerability to psychopathology (Cicchetti & Curtis, 2006; Herrman et al., 2011). Further studies of both maltreated and non-maltreated children revealed that high morning cortisol levels correlate to higher resilient functioning in the abused children with further studies showing personality, cortisol, and dehydroepiandrosterone as independent contributors to resilience (Cicchetti & Rogosch, 2007). An onslaught of genetic studies on resilience provides evidence of gene-environment interaction effects on coping strategies in high risk and the effects of genetic polymorphisms which is furthering the understanding of promotion of resilience from a biological standpoint (Cicchetti, Rogosch, & Sturge-Apple, 2007; Parent et al., 2005).

Emphasis on the protective role of the family, or social system resources, has emerged across disciplines both in the United States and internationally. A longitudinal study in the United Kingdom with a nationally diverse sample showed the importance of family factors, including maternal warmth, positive home atmosphere, and positive sibling relations, as a strong resiliency factor against bullying victimization (Bowes et al., 2010). Correlation of the family resilience factor as a preventative measure against risk factors has also emerged in promotion literature. For example, the Center for Substance Abuse Prevention (CSAP) has funded a large implementation for a community-based church program that targets strengthening family resilience as a way to prevent alcohol and drug use in preteens and teens with positive results in the communities (Johnson et al., 1998).

Resiliency research continues to flourish among children in different environments such as the rural, urban, and suburban settings as well as resiliency studies in different ethnicity groups. In a recent study of parental support as a protective factor in Latino youth, researchers found that the community-academic partnership benefited these youth and predicted later success among the children, whereas Latino parents' beliefs on seeking outside assistance became a barrier in the resilience promotion programs in the community (Shetgiri et al., 2009). Researchers found the Latino young people in the United States

are currently one of the highest cohorts of risk exposure including violence among family and friends, gang-related violence, homicide, suicide rates, school dropout, and poverty levels (Eaton et al., 2007; Fergus & Zimmerman, 2005). Shetgiri and colleagues (2009) explored barriers to success including lack of parental involvement, low family expectations, and negative influence of the family as major themes of risk within this group. Interestingly, researchers found that the Latino youth's teachers held a major importance in helping them succeed and move out of the projects, whereas, parents often had a negative perception of teachers and support staff at the schools (Shetgiri et al.).

Finally, the emergence of the resiliency concept as a metatheory to guide interventions has been utilized across multiple disciplinary treatment plans. Vinson (2002) incorporated the Child Resilience Model<sup>®</sup> to look at pediatric management of a chronic health condition. Studying children with asthma, researchers incorporated resilience components of family influences and specific interpersonal characteristics of coherence, internal locus of control, competence, problem-solving, and self-esteem as integral to treating and caring for a child with chronic illness (Vinson).

## Overview of Strategies

Promotion strategies will often focus on one or more of the well-defined resilience protective factors that have been established through over 50 years of research. Interventions focus on multiple levels of individual (intrapersonal, interpersonal, or group), family-level (instrumental, social or moral support), or community (neighborhood, school) factors and will often incorporate more than one into a successful design. These broad categories and subcategories of terms are referenced in the literature by a multitude of terminology but ultimately are synchronous in meaning. (See Table 1 for overview of resilience protective factors used throughout promotion interventions.)

**Resiliency During Childhood, Table 1** Resilience protective factors

Individual protective factors	<i>Intrapersonal</i>
	Cognitive functioning
	Creativity
	Adaptability
	Self-efficacy
	Self-esteem
	Anger
	Impulse control
	Positive temperament
	Motivation
	Purpose
	<i>Interpersonal</i>
	Social skills
	Empathy
	Communication skills
	<i>Group membership</i>
	Activism
Religiosity	
Racial identity	
Family-level protective factors	<i>Instrumental support</i>
	Stable family resources
	Parenting skills
	Parental support
	Parental monitoring and supervision
	Consistent discipline
	Household rules and responsibilities
	Authoritative parenting style
	Family communication
	<i>Social support</i>
	Family connectedness
	Parent-child relationships
	<i>Moral support</i>
Spirituality	
Religion	
High academic expectations	
Community protective factors	Neighborhoods
	Schools
	High levels of community resources
	Racial diversity
	Low unemployment
	High community expectations

Adopted by authors (Armstrong et al., 2005; Lazarus & Folkman, 1984; Rak & Patterson, 1996; Resnick, 2000; Sapienza & Masten, 2011; Werner & Smith, 2001)

Reducing barriers or decreasing risk factors is often coupled with the promotion of protective factors. In many incidences, the very act of reducing a risk factor will create a protective factor in its place. For example, by teaching parenting skills or strengthening the parent-child relationship and hence enhancing a protective factor, the corresponding risk factors, inconsistent, harsh parenting models and insecure attachments, are replaced and the individual resilience traits are enhanced.

As Werner discovered in her early research, family connectedness has repeatedly been shown as one of the strongest predictors for health outcomes in pediatrics (Resnick, Harris, & Blum, 1993; Werner, 1994). Preventative interventions that help families develop strong protective factors are more cost-effective than supplying aid for families in crisis (Patterson, 2002). Research focusing on family communication skills training as well as the parent’s role in supporting a healthy environment and lifestyle has continued to flood the literature as one of the prime interventions in promoting pediatric resilience (Resnick et al., 1993). An understanding of family resilience as a protective process is best explained by the Family Adjustment and Adaptation Response (FAAR) model<sup>®</sup> (Patterson, 2002). In this construct, the emphasis on family cohesiveness, flexibility (through family routines), and communication as core protective factors allows the individual to learn adaptive conflict resolution and decision making (Patterson).

Identifying the child’s coping style and building on healthy stress management skills continues to be included as successful promotion interventions. Adapting a variety of coping skills has been referenced as a hallmark of resilience and positive outcomes throughout life and development and strengthens problem-solving capabilities (Puskar, 2010; Rew & Horner, 2003; Shelton & Lyon-Jenkins, 2006). For example, Kurdek and Berg (1987) found children have more difficulty if they blame themselves for parental discord and divorce. By teaching coping management, replacing avoidance or self-blame with reflection and

acclamation, children have healthier outcomes (Kurdek & Berg; Wolchik, Schenck, & Sandler, 2009). In a follow-up study of preventative interventions for children after divorce, researchers found significantly less substance abuse, externalizing behavior, and fewer symptoms of mental disorders after completion of a program which incorporates coping into its framework (Wolchick et al., 2002).

## What Works

Successful interventions will focus on building strengths and resources of the child and family while addressing the overall functioning of the child as opposed to the concentration on solitary discrete problems. In other words, successful programs must address a number of factors and avoid concentrating on a sole intervention. Fostering resilience through the enhancement of protective resources and intervening in early childhood greatly reduces any negative impact from risk factors and bad outcomes. Programs that provide consultation and training to parents, schools, neighborhoods, and individuals which emphasize the importance of coping, self-esteem, and other protective factors tend to have most success.

Family and child strengthening approaches have an impact on increased resilience such as improving child outcomes indicated by programs such as WIC, childcare, early preschool, and family support programs. Urie Bronfenbrenner (1979), well known for his Ecological Systems Theory, was the cofounder of the United States' HeadStart® program for disadvantaged pre-schoolers. HeadStart® is a nationally established program in the United States that provides education to the child and family, health, and nutrition; fosters parental involvement; fosters parental resiliency interventions; and offers support services for at-risk children (National Head Start Association [NHSA], 2011; Rak & Patterson, 1996). Other major organizations have been founded with this concept such as Big Brothers Big Sisters and the Police Athletic League in order to mentor parents

and role model and help promote resiliency by meeting a major protective factor component of environmental support (Big Brothers Big Sisters, 2011; Rak & Patterson, 1996).

The New Beginnings Program® (NBP), originally developed in the 1980s, is a resiliency-based prevention intervention program for families of divorce by reducing the child's exposure to risk factors and increasing resilience resources (Wolchik et al., 2009). NBP® is designed for divorced parents who have children between the ages of 3 and 17 with the goal of promoting resilience among children following parental divorce. The NBP® consists of 10 weekly group sessions and two individual sessions. Parents learn skills to improve parent-child relationship quality and effectiveness of discipline, reduce exposure to interparental conflict, and decrease barriers to nonresidential parent-child contact. Each session includes a short lecture, skill demonstration, and skill practice. Participants are assigned homework after each session; difficulties and successes in implementing the skills at home are discussed in subsequent sessions. Each group is co-led by two master's-level clinicians. With focus on modifying risk factors while also adding protective factors to the family system, the NBP® has shown to improve the quality of parenting, such as the mother-child relationship, effective discipline, and parenting skills. Repeated evaluations have showed that the NBP® has had positive youth adaptation outcomes lasting into adolescence (Wolchik et al.).

Teaching Kids to Cope® (TKC) is a noteworthy cognitive-behavioral education program for teenagers aged 12–18 years old with symptoms of depression or thoughts of suicidal ideation (Puskar, 2010). Through group sessions, based on Lazarus and Folkman's Stress and Coping Theory, participants review principles of stressors, self-image, coping, family relationships, and communications. Participants are then aided in problem identification exercises through experiential learning (Lazarus & Folkman, 1984; Puskar, 2010). The program consists of 10 sessions, 1 h a week, and is taught by a health-care professional fully versed in the TKC® intervention program.

Follow-up studies have found an improvement in depression symptoms and higher use of cognitive problem-solving coping strategies after completion of the TKC<sup>®</sup> curriculum (Puskar, Sereika, & Tusaie-Mumford, 2003).

## What Is Promising

The Penn Resiliency Program<sup>®</sup> (PRP) is a curriculum based on cognitive-behavioral and social problem-solving skills which focuses on group interventions for late elementary and middle school students (Gillham & Reivich, 2011). This program is based on the Adversity-Beliefs-Consequences (ABC) model where students are taught to detect and evaluate inaccurate thoughts and challenge negative thoughts by considering other interpretations. The PRP<sup>®</sup> addresses problem-solving and coping through difficult situations and negative thoughts while learning assertiveness, negotiation, and relaxation (Gillham & Reivich). The curriculum includes lessons where these resilience concepts and skills are practiced and demonstrated through examples with the goal to incorporate these skills into real-life situations. Evaluated in over a dozen randomized controlled designs, the PRP<sup>®</sup> has now been implemented internationally (Gillham & Reivich). For example, the UK Resilience Program<sup>®</sup> is training teachers to use the PRP<sup>®</sup> curriculum in order to teach resilience skills to middle school students. A similar program using PRP<sup>®</sup> in Australia known as the “Geelong Grammar School Positive Psychology Project” is being implemented at boarding schools to incorporate resilience skills into the school’s culture. Canada’s “Reaching In...Reaching Out<sup>®</sup>” (RIRO) program combines the PRP<sup>®</sup> program with Reivich and Shatté’s *The Resilience Factor* to reach youth from birth to seven years by training adults in role model thinking and coping strategies, which focuses on the adult-child relationship components of resilience (Child and Family Partnership, 2010; Reivich & Shatté, 2002).

The Promoting Alternative Thinking Strategies<sup>®</sup> (PATHS) curriculum aims at strengthening

executive functioning behaviors at a school-based prevention level. Executive functioning refers to inhibitory control and planning, problem-solving, emotional regulation, and attention skills (Greenberg, 2006). Based on the Affective-Behavioral-Cognitive-Dynamic (ABCD) model integrating cognition, affect, language, and behavior, the PATHS<sup>®</sup> program aims at preventing resilience by reducing aggression and behavior problems by promoting the development of social-emotional competence in the school-aged years. Children are taught verbal control, which is control over limbic impulses, by providing opportunities for self-control. Verbal processing of action-based curriculum helps focus children on identifying and labeling different feelings and how to manage these feelings (Greenberg). Outcome trails have shown the PATHS<sup>®</sup> curriculum results in decreased externalizing and internalizing of problems and has increased both social and emotional competence (Kam, Greenberg, & Kusché, 2004). A randomized control study showed great improvements in inhibitory control and verbal fluency with the PATHS program with continued improvement at the 1 year follow-up (Greenberg, 2006).

The Solihull Approach Model<sup>®</sup>, developed and being implemented in the United Kingdom, was constructed to better support emotional health and well-being between children and their parents (Douglas, 2010). The program focuses on family risk resilience factors and works one-on-one with families as well as parent support groups (Douglas). Focusing on the child’s main relationships, the model integrates child development and behavioral research in order to develop emotionally healthy children. Parents are taught a variety of processes to help their child manage emotions and understand reciprocity concepts as well as “containment” referring to emotional communication between two parties. The Solihull Approach<sup>®</sup> is currently being implemented in UK programs and used by the UK Department for Education. Further evidence-based studies are needed to examine reliability and construct validity of the program as well as the implementation of longitudinal studies.

## What Does Not Work

As distress occurs in all contexts, socioeconomic status and areas of life, and does not discriminate across ethnicities, completely altering the exposure to vulnerability to children is impossible. Certain situations are uncontrollable such as the death or illness of a parent or prolonged chronic child stressors such as neighborhood problems and violence. Although resiliency programs and implementation of therapeutic resiliency strengthening are fundamental to pediatric emotional health, psychological vulnerability will always factor into the patient's character. Because of this limitation, the evaluation of resiliency programs faces multiple obstacles.

Controversy exists on whether we can actually train or teach resilience versus resilience as an innate, hardwired trait within the personality or inner self. An antagonistic theory of resilience training argues that due to biological programming or damage to neural structures, resilience can only be taught to a certain degree (Herrman et al., 2011). Since the psychobiology of resilience is a very novel and emerging field, further studies are indicated before any consensus on this theory may materialize. Other researchers argue that this controversy is rooted in the multiple uses of different terminology in the resiliency field (Herrman et al.). Famed resiliency expert, Dr. Al Siebert (1996), for example, argues that resiliency cannot be taught, but it can be learned by developing unique combination of inborn attributes and abilities (Siebert).

Limitations in the resiliency research, which further complicate the understanding of what does or does not work in certain populations, are the methodological considerations of research studies. For example, not all studies use standardized measures; some are small and have very specific population groups which may limit generalizability, while other cross-sectional designs, for example, cannot account for cumulative factors (Herrman et al., 2011). Generalizability of intervention programs to other groups outside the defined population of the original intervention study is often in question or stated as a limitation in published resiliency studies

(Herrman et al.). Therefore, further research is needed across the resiliency field to provide evidence-based practice guidelines and support for the best model of practice in implementing resiliency promotion programs. There is not enough evidence to clearly state what strategies do not work in promoting positive resilience factors.

## Summary

Promoting pediatric resiliency, especially those at risk due to poverty, family discord, illness, violence, or other risk factors, is essential in long-term success and adjustment into adulthood. Focusing on protective factors as a conceptual base for prevention programs enhances the pediatric resilience concept in youth. Building resiliency, especially in at-risk youth populations, has become a major goal of different community, medical, and personal intervention programs. Promoting pediatric resilience is generally seen as a positive approach to minimize adverse mental health sequelae and, therefore, decreases psychological vulnerability. Cognitive-behavioral techniques include increasing optimism, cognitive plasticity, strengthening coping skills, while focusing on family involvement is becoming a standard for resilience promotion interventions.

Further external validity and reliability studies are needed in the evaluation of the numerous resiliency promotion programs that have materialized to include multiple community settings in both rural, suburban, and inner city settings alike. The continued longitudinal follow-up with participants in resiliency programs will further contribute to understanding resilience strategies that are successful versus those that still need further evidence of sustainability.

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## School Absenteeism During Childhood

Christopher A. Kearney and Rachele Diliberto  
Department of Psychology, University of  
Nevada, Las Vegas, Las Vegas, NV, USA

### Introduction to School Absenteeism

#### Introduction

Problematic school absenteeism is a vexing issue for educators, mental health and medical professionals, and those working in juvenile justice settings. Absenteeism from school is a national and international problem (Kearney, 2008) that has received burgeoning research attention from experts in many disciplines. The prevalence, scope, and potentially devastating outcomes of prolonged school absenteeism are pervasive and have thus led to the development of early intervention and prevention strategies to be covered in this entry.

#### Definitions and Scope

Problematic absenteeism has no consensual definition because researchers and school district officials often employ idiosyncratic parameters to delineate excessive absences. A recently proposed definition of problematic school absenteeism based on a review of outcome studies includes school-aged youths who (1) have missed at least 25 % of total school time for at least 2 weeks, (2) experience severe difficulty attending classes for at least 2 weeks with significant interference in a youth's or family's daily routine, and/or (3) are absent for at least 10 days of school during any 15-week period while school is in session, with an absence defined as 25 % or more of school time missed (Kearney, 2008). Problematic school absenteeism has also been equated with the term school refusal behavior that refers to child-motivated refusal to attend school and/or difficulties remaining in classes for an entire day. Problematic school absenteeism or school refusal behavior thus covers different forms of absences such as complete or partial

days missed, skipped classes, chronic tardiness, morning misbehaviors in an attempt to miss school, and severe distress at school that precipitates pleas for future nonattendance (Kearney & Silverman, 1996). School absenteeism may be a singular problem or one embedded in comorbid behavioral, psychiatric, or familial problems (McShane, Walter, & Rey, 2001).

The prevalence and scope of school absenteeism are substantial. A community survey of youths with truancy and anxiety-based school refusal revealed a prevalence rate of 8.2 % (Egger, Costello, & Angold, 2003). National statistics indicate that 19 % of fourth graders and 20 % of eighth graders missed at least 3 days of school in the past month (National Center for Education Statistics, 2006). In addition, graduation rates are below 50 % in several major American cities (Editorial Projects in Education Research Center, 2008). The overall prevalence of school refusal behavior, which includes absentee-related behaviors such as tardiness, reportedly ranges up to 28–35 % (Kearney, 2001; Pina, Zerr, Gonzales, & Ortiz, 2009). Problematic school absenteeism is associated with a myriad of poor outcomes such as substance abuse, violence, suicide attempt, risky sexual behavior, pregnancy, delinquency, injury, illness, and school dropout as well as long-term economic deprivation and social, marital, occupational, and psychiatric problems (Hibbett & Fogelman, 1990; Hibbett, Fogelman, & Manor, 1990; Kogan, Luo, Murry, & Brody, 2005; Tramontina et al., 2001).

#### Theories

Theories of problematic school absenteeism have been historically limited in scope and restricted to subsets of youth. Researchers of various disciplines have tended to conceptualize youth with problematic absenteeism based on specific forms of behavior. Psychologists, for example, often concentrate on fear- and anxiety-based absenteeism in the form of school phobia, separation anxiety, or school refusal. These conditions apply to youths who miss school due to excessive fear of a school-related stimulus (e.g., bus, teacher), difficulty

separating from major attachment figures such as parents, and anxiety regarding social and evaluative situations at school (e.g., peer interactions, tests) (Suveg, Aschenbrand, & Kendall, 2005).

Educators, criminal justice professionals, and social workers, on the other hand, often concentrate on delinquent-based truancy. Truancy is a legal term that refers to illicit and/or surreptitious absences from school and is typically based on a set number of absences (e.g., 10+ absences in one school semester). Truancy has additional meanings in the research literature that include school absenteeism associated with poor parental knowledge or supervision, low anxiety, academic problems, and conditions such as homelessness or poverty (Fremont, 2003). An important drawback of disparate theories of problematic school absenteeism is that little consensus has evolved regarding effective assessment, intervention, and prevention practices for this population (Kearney, 2003).

More contemporary theoretical approaches have focused on efforts to integrate discipline-specific constructs to provide a comprehensive model that includes all youth with problematic school absenteeism. Researchers have thus begun to focus on constructs that “cut across” traditional distinctions (e.g., anxiety-based school refusal, truancy), eschew models of school absenteeism based purely on symptomatology, and emphasize ecological variables such as school climate (Claes, Hooghe, & Reeskens, 2009; Williams, Sanchez, & Hunnell, 2011).

One such model was designed by Kearney and colleagues who emphasized the function of absenteeism instead of behavior form (e.g., Kearney & Albano, 2004). Youths are hypothesized to refuse school for reinforcers that include (1) avoidance of school-based stimuli that provoke negative affectivity (general anxiety/depression), (2) escape from aversive social and/or evaluative situations, (3) pursuit of attention from significant others, and (4) pursuit of tangible rewards outside of school such as time with friends, sleeping late, or watching television (Kearney & Silverman, 1996). The first two functions involve negative reinforcement, or a desire to terminate an aversive school-related event.

The latter two functions involve positive reinforcement, or a desire to pursue more alluring activities outside of school. Youths may also refuse school for two or more functions. This functional model has received extensive empirical support with respect to classifying, assessing, and treating school refusal behavior (Haight, Kearney, Hendron, & Schafer, 2011; Kearney, 2007; Kearney & Silverman, 1999).

Other researchers have proposed multidisciplinary models that encompass broader ecological and contextual variables that impact problematic absenteeism (Reid, 2003; Rodriguez & Conchas, 2009). Kearney (2008) summarized these efforts by arranging contextual factors in hierarchical order. These contextual factors include those pertinent to a youth with problematic absenteeism as well as his or her parents, family, peers, school, and community. Contextual factors include child psychopathology, parenting style, family communication dynamics, deviant peer associations, school climate, and disorganized neighborhoods, among others. Each contextual factor can occur alone or in combination with other contextual factors. Efforts that involve greater resources (e.g., school-based personnel, clinicians, school district task force) and complexity will be necessary to address and prevent problematic absenteeism impacted by multiple contextual variables.

## Research

Research to explore the dimensions of problematic absenteeism has primarily concentrated on classification, assessment, treatment, and prevention. Research in this area tends to be dominated by psychologists who study specific aspects of school refusal behavior as well as professionals in other disciplines (education, criminal justice, law, social work) who study broader aspects of truancy. Research methods from both approaches are described next.

Psychologists who study youths with school refusal behavior generally emphasize quantitative research methods with a particular focus on behavioral assessments. These methods are

utilized to gain a clearer picture of epidemiology, specific symptomatology and subtypes, and treatment effectiveness regarding this population. Psychologists emphasize the psychopathology associated with school refusal behavior and tend to focus on child, parent, and family variables that impact the behavior. An advantage of this approach is that the methods are highly empirical and the measures have good reliability and validity. Another advantage, discussed later, is that assessment measures in this area have been linked directly to effective treatments. A key disadvantage of the traditional psychological approach, however, is that complicated school absenteeism impacted by broader variables (e.g., school, community) has not been examined closely (Lyon & Cotler, 2007, 2009). Examples of psychological research in this area are presented next.

Egger and colleagues (2003) examined the prevalence and symptomatology of youths with problematic absenteeism via structured diagnostic interview. Youths were classified as pure anxious school refusers, pure truants, mixed school refusers, and nonschool refusers. The overall prevalence of problematic absenteeism was 8.2%. Those with pure anxious school refusal had significantly more diagnoses of separation anxiety and generalized anxiety disorder, simple and social phobia, and depression than pure truants. Pure truants had significantly more diagnoses of oppositional defiant and conduct disorder than pure anxious school refusers. Hansen, Sanders, Massaro, and Last (1998) also utilized a structured diagnostic interview and found that older age, lower levels of fear, and less active families were most predictive of greater levels of school absenteeism.

Other psychologists have examined the classification of school refusal behavior. Kearney (2007) tested the validity of the functional model of school refusal behavior outlined earlier. Children and parents completed questionnaires of internalizing and externalizing behavior problems. Function of school refusal behavior (assessed via the measure described next) was found to mediate the relationship between (1) forms of behavior often related to absenteeism

(e.g., school-based fear, anxiety, depression) and (2) absenteeism severity. Function was also found to be a better predictor of absenteeism severity than behavior form and was thus proposed as a more accurate and useful way to classify youths with school refusal behavior.

Psychological research strategies to evaluate school refusal behavior have involved assessment as well. For example, Haight and colleagues (2011) tested the construct validity of the School Refusal Assessment Scale-Revised, a measure of the relative strength of function of school refusal behavior for a particular child. Youths were recruited from truancy court and truancy diversion settings and assessed via a battery of questionnaires regarding internalizing and externalizing behavior problems. Confirmatory factor analysis revealed that child and parent versions of the measure largely held their four-factor structure in this sample and that individual functions were associated with symptom sets as predicted (e.g., negative reinforcement functions with anxiety and depressive symptoms). The findings replicated and extended previous work in clinical outpatient samples (Kearney, 2002, 2006).

Psychologists also employ specific behavioral approaches to examine treatment of youths with anxiety-based school refusal. King et al. (1998) randomly assigned children to cognitive behavioral treatment or waitlist control. Treatment included (1) child-based rapport building, coping skills training, relaxation training, cognitive therapy, and imaginal and in vivo exposure; (2) parent-based training in behavior management; and (3) a meeting with a child's teacher regarding treatment. Treatment for six sessions was superior to control regarding school attendance, fear, anxiety, and depression. Treatment was especially effective if a youth returned swiftly to school and if parents and youth were involved in the intervention.

As mentioned, professionals in other disciplines tend to study broader aspects of truancy and often emphasize qualitative research methods. Much of this work has involved prevention of problematic school absenteeism that will be described more in the following sections. A sample of research in this area is thus presented here.



Claes et al. (2009) utilized survey data from 93,096 14-year-olds in 28 countries to identify causes of truancy, which was measured qualitatively by asking principals about the frequency (never, sometimes, often) of absenteeism at their school. The researchers found that lower rates of truancy were associated with broader contextual factors such as supportive school climate, teachers that encourage participation, and private schools. Rodriguez and Conchas (2009) utilized interviews and observations to conclude that improved peer relations and teacher-student relationships were important for preventing dropout.

Survey data have also been used to examine treatment outcome for truancy court and related interventions. Hendricks, Sale, Evans, McKinley, and Carter (2010), for example, examined the effectiveness of a school-based truancy court intervention for youths in middle school. Students were expected to attend regular truancy court sessions in school, complete assigned work, and avoid substance use and confrontations with peers. The survey measured student attachment toward school and the truancy court. Absenteeism decreased significantly over the course of two semesters.

## Strategies

The empirically based research strategies and resulting data sets from the aforementioned and other studies are beginning to produce guidelines for clinical practice for youths with problematic school absenteeism. A key example is the prescriptive approach that flows directly from the functional model of school refusal behavior described earlier. For example, Kearney and Silverman (1999) found that intervention administered on the basis of a youth's primary function of school refusal behavior was superior to an intervention administered on the basis of a youth's least influential function of school refusal behavior.

Empirical data also indicate that broader variables such as school climate and a student's relationships with peers and teachers at school are impact factors that can play a central role in

a systemic intervention. A good example is the Check and Connect program that emphasizes relationship building, routine monitoring of attendance, school-based support tailored to individual student needs, academic motivation, conflict resolution skills, and facilitating student access to school-related activities and events. This program has been shown to significantly boost student participation at school and reduce full absences and tardiness rates (Lehr, Sinclair, & Christenson, 2004).

## What Works

The following sections focus more specifically on early intervention and prevention strategies that have been designed to curb absenteeism and dropout. One of the most successful systemic methods of curbing absenteeism and dropout involves alternative educational programs within a particular school. Alternative educational programs typically encompass a "school within a school" approach that emphasizes small class size, project-based and cooperative learning, individualized and interdisciplinary instruction such as vocational or technical skills training, apprenticeships, and diverse instructional methods such as computers, direct experience, and service-learning activities. These programs are also known as career academies or small learning communities. Students in these programs are supervised closely, receive extended instruction for troublesome subjects, obtain specialized training that fits the business needs of a local community (e.g., finance, tourism), and earn equivalent college course credit. Career academies are often joint ventures between school officials and business owners who supply funding, curriculum input and review, and later employment internships and opportunities (Detgen & Alfeld, 2011).

A meta-analysis of truancy and dropout prevention programs for middle and high school students revealed that alternative educational programs were best for reducing dropout and enhancing attendance, academic achievement, and graduation rates compared to other methods



(Klima, Miller, & Nunlist, 2009). Others report that career academy graduates are more likely to be engaged in the academic process and to plan for college than controls (Orr, Bailey, Hughes, Kienzl, & Karp, 2007). In addition, a consistent finding is that graduates of career academies have greater earning potential than control groups (Fleischman & Heppen, 2009).

A related systemic strategy is alternative schools that comprise completely separate learning facilities for students with histories of academic achievement difficulty, disruptive behavior problems, and nonattendance. Alternative schools may involve a specific type of vocational training, a combination of home study and in-class or laboratory work, extended class time, summer coursework, work release, or afternoon or evening classes, among other nontraditional options. Alternative schools emphasize academic remediation and credit accrual at a modified pace, individualized curricula and psychosocial services, and links to the business community. Alternative schools may be more educational or disciplinary in nature, though the former has tended to be more effective for preventing school dropout (Dupper, 2008).

Another systemic model to reduce problematic absenteeism is to move traditional truancy courts into school buildings. These “hybrid” efforts are designed to reduce stigmatization and transportation problems, emphasize a multidisciplinary problem-solving approach to minimize obstacles to attendance, increase parental involvement, and provide psychosocial and other services. Judgments from these courts often involve sanctions that promote school attendance such as school-based community service and extracurricular activities, drug testing, family-based and other therapies, requiring students to eat lunch at school, tutoring, and teacher mentors (Smink & Reimer, 2005).

Shoenfelt and Huddleston (2006) evaluated a truancy court diversion program involving school personnel home visits to investigate factors related to absenteeism, meetings with a judge, and parenting classes, academic tutoring, anger management, mentoring, and support groups. The truancy diversion group evidenced

significant reductions in unexcused absences and improved grades compared to a control group. Richtman (2007) examined a truancy intervention program that referred absentee students and their parents to school-based meetings with a county attorney, school social worker or counselor, and probation officer to create a school attendance plan. The meetings also included referrals to social services agencies, substance use and mental health evaluations, and student or family counseling to address nonattendance. Truancy petitions were reduced nearly 60 % over a 10-year period for youths under age 16 years. Fantuzzo, Grim, and Hazan (2005) found that placing court proceedings within school buildings and linking families with caseworkers from various service organizations improved attendance compared to a control group at 1-year follow-up.

Other systemic strategies have involved restructuring an existing school to address broader climate factors that may be affecting attendance rates. The Positive Behavioral Intervention and Supports (PBIS; [www.pbis.org](http://www.pbis.org)) program is designed to emphasize prosocial skills and behaviors, monitor student attendance and other disciplinary issues regularly, and implement evidence-based behavioral practices such as the psychological methods described earlier. This program may be integrated with response to intervention practice to address academic issues that contribute to disciplinary concerns such as school absenteeism (Sailor et al., 2006). PBIS is typically implemented by a small, school-based team of teachers, psychologists, counselors, or social workers, though some have advocated that the team be expanded to include administrators, parents, and community members (Sugai & Horner, 2006). PBIS has been linked primarily to academic gains, though some have found that office disciplinary referrals and school suspensions are reduced as well (Lassen, Steele, & Sailor, 2006).

Sutphen, Ford, and Flaherty (2010) reviewed 16 studies of truancy interventions that used group comparison or one-group pretest/posttest designs. Broader interventions that seemed effective for reducing truancy included school-based structural changes such as smaller and more

independent academic units as well as alternative educational programs. Others have concluded that school dropout prevention programs are most successful if they involve an individualized approach that tailors intervention to the specific academic, health, skill, social, and resource needs of students and their families. Such interventions are designed to maintain student and family investment in the educational process (Christenson & Thurlow, 2004; Dynarski & Gleason, 2002). Others suggest that the most effective school-wide programs are those that target middle school students who are behind in grade level and those that provide occupational training programs with GED assistance (Mac Iver, 2011).

### What Is Promising?

Other early intervention and prevention strategies have shown promise with respect to curbing truancy and school dropout, though additional empirical support is needed. These promising strategies tend to be less systemic in nature than those discussed in the previous section. Instead, these strategies focus on providing supplemental services to at-risk youth within the context of an existing school (Rumberger, 2011). The reader should note that psychological strategies for individual students with school refusal behavior are effective (see earlier section) but that this section focuses on broader prevention efforts.

One promising strategy is academic remediation or tutoring. These programs focus on identifying students who are struggling academically and addressing their skill deficiencies (Teasley, 2004). Many of these programs also include a mentoring component whereby a teacher or other school official serves as an advocate, role model, and/or service coordinator for a student who is missing school on a regular basis. The Check and Connect program mentioned earlier is a good example. Anderson, Christenson, Sinclair, and Lehr (2004) found that the closeness and quality of the student-mentor relationship was associated with improved engagement with respect to attendance. In our own work with a truancy diversion program, academic

remediation was found to be the key variable that predicted whether students would remain in school (Chapman & Kearney, 2009). A related strategy is to utilize peers as mentors who contact an absentee youth at night, encourage him to return to school, and offer to help remove obstacles to attendance (DeSocio et al., 2007). Peer mentors may be especially helpful for youths with social skill deficits or those in single-parent families (Teasley, 2004; White & Kelly, 2010).

Another promising strategy is to offer health-based services in schools to minimize illness on a grand scale, manage asthma symptoms, provide specialized educational services for students with a chronic medical condition, and supply routine medical care for pregnant youth. Strategies to minimize illness include hand washing, flu immunization, and lice management (Andresen & McCarthy, 2009; Sandora, Shih, & Goldmann, 2008). Barnett, Arroyo, Devoe, and Duggan (2004) established a school-based prenatal care program to provide routine medical examinations for pregnant youth that would minimize absences due to doctor visits. Results indicated significant reductions in absenteeism and dropout rates.

Youth development programs also have some benefit for ameliorating school absenteeism. These programs often include mental health strategies to reduce emotional, learning, and disruptive behavior disorders and substance use or to enhance coping skills (Weist, Stiegler, Stephan, Cox, & Vaughan, 2010). Other programs focus on conflict resolution, anger management, peer mediation, coping with divorce or family conflict, and sex education (Brown & Bolen, 2008). Youth and parent support groups are sometimes advocated as well to develop social and family communication and parenting skills and to reduce obstacles to attendance (White & Kelly, 2010). Anti-bullying and school safety efforts may also be part of absenteeism reduction strategies (Vreeman & Carroll, 2007). Academic skills training (e.g., study, organization, time management) may be useful as well (Prevatt & Kelly, 2003).

Researchers sometimes combine many of these elements on a more systemic level.

Snyder et al. (2010), for example, implemented a social-emotional and character development program that consisted of 140 interactive lessons. These lessons involved (1) self-concept (relationship among thoughts, feelings, and behaviors), (2) physical and intellectual actions (e.g., hygiene, nutrition, decision-making skills), (3) social and emotional actions (self-control, time management), (4) interpersonal skills (e.g., empathy, conflict resolution), (5) integrity and self-appraisal, and (6) self-improvement (e.g., goal setting, problem solving, persistence). Schools with the intervention had significantly higher reading and math scores, lower absenteeism, and fewer suspensions and retentions than control schools.

Other strategies to curb absenteeism and dropout have been explored at a more preliminary level. These strategies are theoretically sound for reducing absenteeism but require substantially greater empirical support. One such idea involves increasing parental involvement with respect to a child's academic progress and school attendance (Hill & Tyson, 2009). Suggestions for boosting parental involvement include daily communications from a school official about attendance, regular conferences or home visits to establish a collaborative intervention plan, delay of referral to juvenile justice settings, adjustments to academic load and assignments, parenting skills training, assisting parents with their child's homework instruction, and referrals to mental health and social service agencies (Kearney & Bates, 2005). In a related fashion, language or cultural differences between parents and school officials could hinder parental involvement. Suggestions for addressing these differences include home visits, use of interpreters, culturally responsive curricula, school-based child care during parent-teacher conferences, and invitations to special school-based events that are conducted in various languages and geared toward all family members (Broussard, 2003).

Other preliminary strategies include restructuring the role of the homeroom teacher to quickly identify and counsel youths at risk for school absenteeism, implementing school-wide

practices to reward attendance, maintaining a student's peer group across homeroom and morning classes, and increasing student involvement in school policies (Kearney, 2008). Alternative class schedules and modified makeup work policies have also been advocated for at-risk youth (Teasley, 2004). In addition, Sutphen et al. (2010) found that the most promising truancy interventions often involved student- and family-based approaches that relied on contingency management and increased monitoring of attendance.

### **What Does Not Work?**

Other methods to curb truancy have involved formal adjudication of students and parents with an emphasis on punitive practices. These methods include police sweeps of a community to return truant students to campus, referral of youths by school officials to traditional truancy courts (often within a family court system), juvenile detention, mandated community service outside of school, and residential care (Desai et al., 2006; Hendricks et al., 2010; White, Fyfe, Campbell, & Goldkamp, 2001). In addition, many states have passed laws meant to deter truancy by fining students or parents, jailing parents, revoking driver licenses, or depriving access to public assistance.

No empirical data has indicated that these strategies are highly effective at reducing problematic school absenteeism over time. Some theorists have also been highly critical of such practices for their excessive financial cost (e.g., Zhang, 2004). In addition, some truancy laws paradoxically exacerbate absenteeism by increasing barriers to attendance by depriving youths of transportation, jailing parents, or mandating community-based service outside of the school setting (Mogulescu & Segal, 2002). Others have referred to these "zero tolerance" strategies as "repressive" interventions that are unlikely to solve chronic absenteeism unless they are accompanied by systemic strategies designed to improve school climate (Claes et al., 2009).

Other strategies to try to curb absenteeism and dropout involve increasing the legal age at which youths must attend school, boosting the number of courses or credits needed to graduate high school, requiring students to pass an exit examination prior to graduation, and offering dual enrollment in college classes (Rumberger, 2011). Some states and countries have increased the compulsory schooling age from 16 years to 17 or 18 years. Some data indicate that higher compulsory schooling ages tend to be associated with lower dropout and higher graduation rates, but others argue that the variable that explains most of this effect is an educational system that is responsive to a student's individual academic needs (Markussen & Sandberg, 2011). The other strategies mentioned have little supporting evidence as well.

## Summary

Strategies to reduce or prevent problematic school absenteeism, including school dropout, are generally promising but far from standardized or empirically strong. Part of the reason for this is that school absenteeism is impacted by a multitude of variables that range from individual student problems to widespread, systemic problems such as neighborhood disorganization. In addition, professionals from various disciplines who study problematic absenteeism often employ different terminologies, research methods, and assessment and intervention strategies. Effective prevention strategies in this area must emphasize a collaboration of approaches with a heavy concentration on addressing young children, attending to individual student academic and mental health needs, removing obstacles to attendance, enhancing parental involvement, improving school climate, and integrating community members and agencies into the prevention process. Effective prevention strategies must also consider overarching themes such as comprehensive school reform, cultural attitudes regarding education, and structural economic pressures.

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## Sexuality: Promoting Healthy Sexuality During Childhood

Catherine M. Sherwood-Laughlin  
Indiana University, Bloomington, IN, USA  
Department of Applied Health Science, Indiana  
University, Bloomington, IN, USA

### Introduction

When the topic of sex and sexuality comes up, for some, strong feelings emerge. Some of these feelings are embarrassment, anxiety, discomfort, and, for others, contentment and ease. While there are many reasons for causing the array of emotions, many are rooted in the way individuals were exposed, or not exposed, to sexual health issues and sexuality education as a young child. As our society becomes more accepting of sexuality, it is imperative that young children are taught how to navigate the conflicting and complex messages. Although our society is becoming more open to sexual expressions and sexual health education, in most cases these messages are not delivered in a sequential and comprehensive manner that makes sense in young children, let alone to their parents, caregivers, educators, and medical providers. This entry provides information for public health and health promotion professionals regarding the appropriate scope and sequence of sexual health education for young children beginning in infancy through pre-teen (ages 0–11) which can help to build a foundation which children can begin to develop a healthy sexuality.

### Definitions and Scope

There are a number of terms being used interchangeably in the sexual health literature; therefore, it is imperative to define terms associated with childhood sexuality.

*Sex* is defined as male or female based on genetic and anatomical sex characteristics (Yarber, Sayad, & Strong, 2010).

*Sexuality* is a term that can be difficult to define because it can depend on the context in which it is used by the individual(s) using this term. We must take into consideration that context, which is rooted in life experiences, educational attainment, and culture; therefore, a basic and general definition is provided here. Yarber et al. (2010, p. G-11) define sexuality as “the emotional, intellectual, and physical aspects of sexual attraction and expression.”

*Sexuality education* is defined as “a lifelong process of acquiring information and forming attitudes, beliefs and values” (*Sexuality Information and Education Council of the United States [SIECUS]*, n.d.-b).

*Sexual health*, as defined by the *World Health Organization [WHO]* (n.d.), is “a state of physical, mental and social well-being in relation to sexuality. It requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence.”

### Theories

One of the primary goals of sexual health education is to provide information so individuals have the tools and skills to reduce their risk-taking behaviors and to make choices and decisions that lead to a healthy lifestyle. There are numerous theories in the area of sexuality to help explain sexual health and behaviors. Human sexuality is not one dimensional, rather its foundation is comprised of philosophies and theories that exist within the fields of biology, psychology, sociology, anthropology, and applied behavioral health sciences. Additionally, human sexuality is further explained and understood by including both ethical and cultural dimensions. Biopsychosocial models combine the notions of the biological, psychological, and socioenvironmental factors to help understand behavior (Ehrhardt, 2000). It is important to link biology and social behavior when studying human sexuality in order to determine the variables which lead to decisions and outcomes involved in sexual health.

The biopsychosocial model that is utilized most often to understand human sexuality is the *main-effect model* (Ehrhardt, 2000). This particular model posits that a behavior is based on one strong, predominate factor. An example that Ehrhardt uses to explain this model is sexual orientation. She states that if there is a prenatal event that causes sexual orientation, that “event” is the reason a child is homosexual or bisexual and not because of the environment in which the child was raised. The use of this model is simplistic; however, it does not allow for researchers to take into account other variables that could have an effect on the behavior. Therefore, researchers must consider utilizing the *interactional model*. This model takes into account a variety of factors and variables to explain and predict behavior and is not merely a cause and effect model.

There also exist a number of theories in human sexuality to help explain gender identity development, which begins to form during childhood. In the two theories presented here, parent(s) play(s) an important role as to who influences the development of gender identity in children. Freud’s work in psychological development was founded on aspects related to sexual development and was one of the first psychologists to infer that children were sexual and subsequently connected his research on developmental stages to gender identity development (King, 2009). Freud explained that when boys act like their fathers and girls act like their mothers, and when these actions are not deliberate, but conducted on an unconscious level, this is called identification. The child is identifying with the parent that looks most like him or her and responds accordingly.

The second theory is based on social learning theorists’ beliefs that children learn how to act and behave like a certain gender based on imitating children and adults of their own sex. Children bond with their parents, and the concepts within the social learning theory support the notion that children will do what their parents do especially if the behavior is positively reinforced as a stereotypical male or female action (King, 2009).

Theories help us predict and understand behaviors. Based on the concepts embedded in theories, it is understood that children will express their sexual behaviors based on a socioecological perspective. They will respond and act in certain ways based on a multitude of factors and in tandem will lead to the specific sexual behavior. Children will also express themselves in a way that is comfortable and assuring to them based on the reinforcements they received from their parents and society. It is important to realize that one environmental or social factor does not lead to a behavior; rather there are many factors to consider. Therefore, when determining what is the best approach towards educating children about a healthy sexual lifestyle, parents, caregivers, educators, and health-care providers must consider all of the ecological and environmental influences in a child’s life.

## Research

When we discuss sexuality, most do not consider these types of discussions to include infants and children mainly because it is difficult to accept or imagine that infants and children are sexual beings. However, as mentioned earlier, we are sexual beings from birth to death. As we grow and develop, there are specific periods in an individual’s life when physical and psychosexual developments are marked and identified. These changes during infancy and childhood, along with social and environmental factors, impact the way children cope with their own, evolving, sexuality.

In infancy, between the ages 0–2, much of the physical and psychosexual developmental changes are related to touch and comfort. Since language is not developed until later in the infant state, the comfort of a parent and/or caregiver signals to the infant that he/she will be comforted to a desired level of contentment. This is the foundation for the subsequent stages of growth and development; therefore, it is important for parents and caregivers to be able to respond to the basic needs of infants. If bonding and attachment is secure between the parent and child, then

**Sexuality: Promoting Healthy Sexuality During Childhood, Table 1** Selected frequency of sexual behaviors (%)

Item	Overall	2–6 boys	2–6 girls	7–12 boys	7–12 girls
<b>Touches genitals at home</b>	45.8	64.1	54.4	36.4	18.4
<b>Undresses in front of others</b>	41.2	49.6	61.9	21.4	23.0
<b>Touches breasts</b>	30.7	43.5	48.4	11.7	9.2
<b>Tries to look at people undressing</b>	28.5	33.9	33.3	27.7	14.9
<b>Interested in opposite sex</b>	23.0	21.0	20.6	19.9	32.8
<b>Looks at nude pictures</b>	15.5	11.3	7.9	27.2	18.4
<b>Masturbates with hand</b>	15.3	22.6	16.3	11.2	8.6
<b>Uses sexual words</b>	8.8	4.8	1.2	19.9	12.1
<b>Talks about sex acts</b>	5.7	2.4	2.8	9.2	10.3

From Friedrich et al. (1991)

the child is more likely to have more stable and secure emotional attachments in adulthood (DeLamater & Friedrich, 2002). It is also during this stage when infants begin to learn about gender roles and how they are expected to express themselves. For example, girls are expected to play with dolls and boys are expected to play with trucks.

Research shows that infants do experience sexual response. According to Martinson (1976), infants and children have the physiological capacity to move beyond just pleasure seeking and pain avoidance. They have the capacity for sexual response at the physiological-reflexive level and perhaps orgasmic capacity. DeLamater and Friedrich (2002) state that male infants can get erections and female infants have evidence of vaginal lubrication. By age 2.5–3, toddlers have expressed rhythmic manipulation of their genitals in addition to expressing other sensual and comforting experiences such as sucking a thumb, rocking back and forth, and being held. Although infants can experience adult-like physiological sexual expression, they obviously do not have the capacity to associate these experiences to sexual fantasies and purposeful self-stimulation as an adult can.

As the infant matures into childhood, between the ages of 3 and 7, the concept of gender identity begins to form and solidify by around age 3 (DeLamater & Friedrich, 2002). At this age, children are becoming more interested in gender roles, identities, and how their bodies

are different than the other sex. It is also at this age when children begin sexual play with their friends or siblings. This is a very natural and an expected developmental experience for this age because children are trying to emulate their parent's behaviors and want to feel grown up. It is important that parents and caregivers normalize this stage of self-sexual exploration and sexual play but also recognize that this type of behavior is to be done alone and in a private place in the home, for example, the child's bedroom. It is also at this age when children begin to ask more questions about sex and sexuality. They are beginning to discover that their bodies look different, they want to know the answers to some more difficult questions like how babies are made, what is an erection, and why can men not have babies.

A study was conducted by Friedrich, Grambsch, Broughton, Kuiper, and Beilke (1991) to determine the sexual behaviors in normal preadolescent children. In their study, children ages 2–12 were evaluated by their mothers to determine the type and frequency of sexual behaviors. One of the findings for both sexes was that there was a decline in overt sexual behavior as the children aged. Another finding was that even though there was a wide variety of sexual behaviors reported (Table 1), there were a few behaviors that were either more aggressive or more like adult behaviors. The researchers indicate that the family context may have influenced the type and frequency of aggressive and adult-like sexual behaviors.

## Strategies

All strategies suggested in this section are based on the developmental capacities of typically developing children. One of the most confusing and frustrating aspects of sexual health education for adults who are responsible for providing this information to children is where to begin, at what age, and how much information is too much or too little. Most adults do not know what information is considered age appropriate, and while they tend to be more on the conservative side when providing information, it is important to be able to understand that children must receive developmentally appropriate information.

Sexuality education is a lifelong educational process. A sexuality health educational program includes information surrounding the topics of sexual development, reproductive health, inter- and intrapersonal relationships, intimacy, body image, and gender roles. It is critical for parents to take on the role of the primary sexuality educators of their children as they are the initiators of this lifelong educational process.

Parents, caregivers, and health-care providers provide the foundation of this journey the moment the child's sex is discovered. The adults in the child's life begin assigning gender roles and identifying for the child, how he or she is different than the other sex. It starts once toddlers can begin to understand and name parts of the body. Toddlers can differentiate the unique outer appearances between boys and girls, and as siblings and friends are added to their lives, they begin to see that body parts are different under clothing. There are numerous teachable moments in a child's life that leads to his or her understanding of sexuality and sexual health issues. This continuous evolution of sexuality and sexual health education lasts a lifetime as the body changes and as children age.

Dr. Sol Gordon, a sexuality educator, coined the term "askable parent." Gordon fully supported the concept that parents must take on the responsibility as the primary sexuality educator of their children, but realized the apprehensions and anxieties that accompany that role. Therefore, Gordon and his wife, Judith Gordon,

published a number of books for parents to help them become "askable" and approachable, regardless of their child's age. In their book, *Raising a Child Responsibly in a Sexually Permissive World*, Gordon and Gordon (2000) provide ways for parents to discuss the sexually sensitive topics in an open and informed manner. Specifically, this book helps parents to become their child's primary sex educator, to be able to answer the most difficult questions about sex, to provide practical and common sense guidance, and to help their children develop a healthy sexuality, along with healthy attitudes, behaviors, and values about sex.

Huberman (2002), Director of Education and Outreach at Advocates for Youth, provides developmental guidelines for parents and educators that are helpful to gauge what is considered age-appropriate sexual health messages for children zero to age 3 (Table 2), ages 4–5, (Table 3), and ages 6–8 (Table 4). It should be noted that children grow and develop at different rates; therefore, parents should consult with their child's teacher, child development professional, or a health-care provider if they are concerned about their child's developmental process.

## What Works

In its most basic context, sexuality education provides critical information and skills for individuals, starting at a young age, the opportunity to learn about how to form attitudes, beliefs, and values about self-identity, relationships with others, and sexual intimacy. Sexuality education also provides life-saving information and decision-making skills regarding unintended pregnancy and disease prevention. What has been shown to work in research is that comprehensive sexuality education program also works. School-based programs complemented with educational messages from parents and sexuality education programs provided in various community settings allow for children to receive information. A comprehensive sexuality education program is defined by [SIECUS \(n.d.-b\)](#) as programs that begin in kindergarten and continue

**Sexuality: Promoting Healthy Sexuality During Childhood, Table 2** Most children, aged 0–3 years old

Physical development	Cognitive development	Emotional development	Sexual development
Double their height between birth and age 3	Learn language and communication skills and advance from using single words to phrases to complete sentences	Develop trust for caregivers who fulfill their needs, such as responding when the child is hungry or wet	Be curious and explore their own body and others' bodies
Triple their weight between birth and age 3	Develop an imagination and begin to create imaginary scenarios and friends	Begin to test independence and explore limits, but still seek closeness to primary caregiver	Experience an erection or vaginal lubrication
Develop teeth and the ability to eat solid foods	Understand the world primarily through their family	Have relationships primarily with family members who are the most important people in the child's life at this time	Touch their genitals for pleasure
Develop 75 % of their brain capacity	Begin to interact with peers through imitation (Although some children at this age do not yet play directly with each other, they often engage in parallel play)	Physically demonstrate feelings, such as kissing and hugging, to show love and hitting to show anger	Talk openly about their bodies
Learn to crawl and walk	Think concretely, retain some information, and process information primarily through their five senses – by seeing, touching, hearing, tasting, and smelling	Master the idea of being happy, sad, or angry, but will generally choose to express emotions physically rather than verbally (The “terrible twos” occur when a child is developing a sense of self outside of and distinct from others, and expresses this individuality by saying “no” and by insisting on doing things himself/herself)	Be able to say and understand, when taught, the appropriate names for body parts (head, nose, stomach, penis, vulva, etc.)
Develop large motor skills such as running, jumping, and climbing up stairs	Identify with and begin to imitate their same-sex parent or guardian		
Begin to take off and put on clothes	Begin to understand the differences between male and female (gender differences and gender roles)		
Begin to control body functions through toilet training	Imitate the language and behavior of trusted adults		

From Huberman (2002)

through the 12th grade. The sexuality education programs include knowledge and skills building age-appropriate, medically accurate information related to topics which include human development, relationships, decision-making, abstinence, contraception, and disease prevention. Abstinence-based or abstinence-plus programs also provide a basis for sexuality education programs, but these programs emphasize the benefits of abstinence but include information about intercourse and other sexual behaviors in addition to contraception and disease-prevention methods.

There is evidence that indicates that parents and adults support and desire comprehensive sexuality programs to be made available in schools. Bleakley, Hennessy, and Fishbein (2006) conducted a study to examine the public opinion

on sex education in schools in order to determine if the public's preferences matched those of policymakers and research scientists. Among their nationally representative sample of US adults ages 18–83, it was discovered that more than 80 % of these adults supported comprehensive sexuality education. In another nationally representative study of adults aged 18 and older, including 1,001 parents of middle and high school students, coordinated by National Public Radio/Kaiser Family Foundation/Kennedy School of Government (2004) found that 90 % of these parents felt it is important to have sexuality education as part of the school curriculum. In addition, the majority of middle school and high school parents supported comprehensive sexuality education instead of abstinence-only

**Sexuality: Promoting Healthy Sexuality During Childhood, Table 3** Most preschoolers, aged 4–5 years old

Physical development	Cognitive development	Emotional development	Sexual development
Continue to grow, but at a slower rate than during infancy and the toddler years (Some parts grow faster or sooner than others. For example, organs grow faster than the body, giving preschoolers a rounded tummy)	Interact with and learn about the world through play activities Begin to experience the world through exploration and feel inquisitive about self and surroundings Begin separation from family as they experience less proximity to caregivers and more independence	Still rely on caregivers, while no longer needing or wanting as much physical contact with caregivers as they received in infancy and as toddlers Continue to express emotions physically and to seek hugs and kisses Socialize with peers, begin to develop relationships, and learn to recognize some peers as friends and others as people they do not like	Experience vaginal lubrication or erection Touch their genitals for pleasure Feel curiosity about everything, and ask about where babies come from and how they were born Feel curiosity about bodies and may play games like doctor
Reach at least 50 % of their adult height and about 20 % of their adult weight by age 5	Understand what is good and bad (though they may not understand why) and be able to follow the rules	Have more opportunities to interact with peers, either through school or recreational activities, and will play with other children	Feel sure of their own gender and have the ability to recognize males and females
Develop more coordinated large motor skills, enabling them to skip, run, and climb up and down stairs	Be able to understand and accomplish simple activities to be healthy, such as brushing teeth or washing hands		Begin to recognize traditional male and female gender roles and to distinguish these roles by gender
Develop fine motor skills, enabling them to tie shoelaces, button shirts, use scissors, and draw recognizable figures	Understand the concept of privacy		Become conscious of their own body, how it appears to others, and how it functions
Continue significant brain development, completing 90 % of such development by age 5			
Develop increased lung capacity and the ability to breathe more deeply			
Lose their “baby look” as their limbs grow longer			
Appear about the same size, regardless of gender			
Increase in overall health and gain resistance to germs			

From Huberman (2002)

programs. These results indicate that parents, and the general public, believe that sexuality education should begin in kindergarten and continued until their child graduates from high school.

According to Gordon and Gordon (2000), children who are knowledgeable about sex and sexual health issues and are comfortable talking about these topics are not more likely to experiment, engage in premature sexual activity, or engage in risk-taking behaviors. In research that focused on the behaviors of young people who received comprehensive sexuality education, it was found that providing sexuality education starting at a young age and continuing the educational and skills-based methods was shown to not encourage young people to have sexual

intercourse, and these programs were more likely to delay the onset of intercourse, reduce the frequency of intercourse, reduce the number of sexual partners, and increase condom and contraceptive use (SIECUS, n.d.-a).

There are four primary goals of a comprehensive sexuality program and they are (SIECUS, 2004) as follows:

1. To provide information about human sexuality which includes reproductive development, inter- and intrapersonal relationships, sexual behavior, sexual health, society, and culture.
2. To provide opportunities to ask questions, explore new concepts and ideas, and assess sexual attitudes. By learning about all of the dimensions of human sexuality along with



**Sexuality: Promoting Healthy Sexuality During Childhood, Table 4** Most grade school, aged 6–8 years old

Physical development	Cognitive development	Emotional development	Sexual development
Experience slower growth of about 2½ in. and 8 lb per year	Develop the skills to process more abstract concepts and complex ideas (e.g., pregnancy and addition/subtraction)	Become more modest and want privacy	Prefer to socialize with their own gender almost exclusively and maintain a fairly rigid separation between males and females (They will tease someone who acts in a way that does not adhere to predefined gender roles)
Grow longer legs relative to their total height and begin resembling adults in the proportion of legs to body	Begin elementary school	Develop relationships with and love people outside the family as their emotional needs are met by peers as well as family	Recognize the social stigmas and taboos surrounding sexuality, especially if parents are nervous about the subject, and will be less open about asking questions
Develop less fat and grow more muscle than in earlier years	Spend more time with the peer group and turn to peers for information (They need information sources outside of family, and other adults become important in their lives)	Develop less physically demonstrative relationships and express love through sharing and talking (They may be embarrassed by physical affection)	Understand more complex ideas with regard to sexuality and begin to understand intercourse apart from making a baby
Increase in strength	Be able to focus on the past and future as well as the present	Need love and support, but feel less willing to ask for it	Look to peers, media, and other sources for information about sex
Lose their baby teeth and begin to grow adult teeth which may appear too big for their face	Develop an increased attention span	Understand more complex emotions, such as confusion and excitement	Understand gender role stereotypes, if presented as such
Use small and large motor skills in sports and other activities	Improve in self-control, being able to conform to adult ideas of what is “proper” behavior and to recognize appropriateness in behavior	Want more emotional freedom and space from parents	May engage in same-gender sexual exploration
	Understand the concepts of normality/abnormality, feel concern with being normal and curiosity about differences	Become better at controlling and concealing feelings	Have a stronger self-concept in terms of gender and body image
	Begin to develop as an individual	Begin to form a broader self-concept and recognize their own strengths and weaknesses, especially with regard to social, academic, and athletic skills	
	Think for themselves and develop individual opinions, especially as they begin to read and to acquire information through the media	Have friends and sustained peer group interaction	

From Huberman (2002)

cultural and societal attitudes and values, children can begin to develop their own sense of their sexual identity and develop relationships with others.

3. To help develop interpersonal skills which includes being able to communicate needs and making good decisions that promote a healthy lifestyle, and peer refusal skills.
4. To help children create a sense of responsibility regarding their sexual relationships with others. This includes making responsible choices surrounding abstinence, resisting peer pressure and premature sexual activity,

and the ability to make decisions to reduce sexual risk-taking behaviors.

Kirby (1997) conducted research to determine if sexuality education does reduce the risk-taking behaviors and concluded that effective sexuality education programs include the following characteristics:

1. Utilizes behavioral goals, teaching methods, and materials that are age appropriate and based on the sexual experiences and culture of the students.
2. The educational programs must be grounded in theories that have been shown to be

effective in influencing students to not engage in health-related risky behaviors.

3. Enough time is allowed in the curriculum to adequately cover all of the human sexuality topics and concepts.
4. A variety of teaching methods are used to engage all types of learners.
5. Includes medically accurate information about the negative consequences related to unprotected intercourse and how to avoid unprotected intercourse.
6. Addresses issues surrounding social and peer pressures related to sexual behavior.
7. Allows the student ample opportunities to practice decision-making, negotiation, and refusal skills.
8. Teacher and peer educators are trained to be effective sexuality educators.

In 2008, Kirby reported on the results of his review of 56 studies focused on either abstinence programs or comprehensive sexuality education programs to determine the impact on adolescents' sexual behavior. The results showed that most abstinence programs did not delay the initiation of sexual activity among the adolescents that were exposed and participated in these types of programs. The comprehensive sexuality programs assessed by Kirby showed a positive impact on behavior where adolescents delayed sexual activity and were more likely to use contraceptives and condoms when they engaged in sexual activities. Kirby states that the results show strong evidence that comprehensive sexuality education programs do reduce the risk of premature sexual activity, unintended pregnancy, and acquiring a sexually transmitted infection.

The Centers for Disease Control and Prevention (CDC) have developed, on their website, Replicating Effective Programs Plus (REP+) (CDC, 2008). The programs on this site have been tested, science-based behavioral interventions in reducing risky sexual behaviors and encouraging safer sexual behaviors. The REP+ programs can be modified and implemented in different community settings to meet specific needs of target populations. Programs for youth include *Cuidate*, a program to reduce HIV sexual risks among Latino youth, *RESPECT*, which is a program aimed at

heterosexual youth aged 14 and older, and *Project AIM* for African American youth aged 11–14.

In 2008, Advocates for Youth released their second edition of their report that provides information about programs implemented in school-, community-, and clinic-based settings that have shown to prevent teen pregnancy, HIV, and STIs (Advocates for Youth, 2008). The programs that were included in this document that were deemed to be effective at reducing teen pregnancy, HIV, and STI infection rates were those programs which were published in peer-reviewed journals; they were evaluated using experimental or quasi-experimental evaluation design using treatment and control groups and included at least 100 youth in those treatment and control groups. In addition, further criteria included follow-up data at least 3 months after the implementation of the intervention, and that the program outcomes were at least two positive behavioral changes among the youth who participated in the program as compared to the control groups. The positive behavioral outcomes were (p. V) as follows:

- Postponement or delay of sexual initiation
- Reduction in the frequency of sexual intercourse
- Reduction in the number of sexual partners/increase in monogamy
- Increase in the use, or consistency of use, of effective methods of contraception and/or condoms
- Reduction in the incidence of unprotected sex
- Showed effectiveness in reducing rates of pregnancy, STIs, or HIV

Twenty-six programs met the criteria set by Advocates for Youth. Examples of effective school-based programs are *Get Real About AIDS*, *Reducing the Risk*, and *Safer Choices*. Community-based programs included *Making Proud Choices*, and an example of a clinic-based program is *Project SAFE*.

## What Is Promising

During the Clinton and Bush administrations, funding for comprehensive sexuality was

eliminated, and Title V, Section of the 510 Social Security Act was enacted to provide funding abstinence-only-until-marriage programs. Since the implementation of Title V, more than \$1.5 billion in federal funding has been spent on abstinence-only-until-marriage programs (SIECUS, n.d.-a). These programs do not include information on how to delay sexual initiation or prevent pregnancy or STDs, including HIV/AIDS. There is compelling evidence that federally funded abstinence-only-until-marriage programs are not effective in stopping or even delaying adolescent sex.

Under the new Obama administration, what is promising is the work of two politicians, Senator Frank Lautenberg (D-NJ) and Representative Barbara Lee (D-CA), who have initiated the repeal of Title V and the transfer of funding from Title V to the Personal Responsibility Education Program (PREP) (SIECUS, n.d.-a). The PREP was made possible through the health-care reform legislation and thus will provide states with the opportunities to apply for funding to support comprehensive sexuality education for children in grades kindergarten through 12th grade. The PREP-funded programs must provide complete and medically accurate information on abstinence, contraception, and prevention of sexually transmitted diseases and HIV. In addition, students are required to learn healthy life skills so they have the necessary information to make healthy decisions.

## What Does Not Work

What does not work is not talking to children about sexuality and sexual health issues. There are three types of abstinence education programs currently offered in the United States. The first type is an *abstinence-only* program, and these programs emphasize abstinence from all sexual behaviors, but do not include information about contraception or prevention of diseases. The second is an *abstinence-only-until-marriage* program. This type of program emphasizes abstinence from all sexual behaviors if the individuals are not married and indicate

that sex outside of marriage is an immoral behavior. In addition, if information about pregnancy and disease prevention are included, the emphasis is placed only on the failure rates. The last type of abstinence program is the *fear-based* program. These programs provide students with negative messages about sexuality and try to control behaviors by emphasizing shame and guilt. The educational messages also include strong messages that are intended to make the students fearful while giving inaccurate and morally based information about condom use, sexual orientation, marriage, and pregnancy. The information is biased and not medically accurate (SIECUS, n.d.-b).

Over the course of 10 years, a comprehensive study was conducted to determine the impact of the abstinence-only-until-marriage programs (Trenholm et al., 2007). The researchers concluded that these types of programs did not delay premature sexual activity and these programs did not have a positive impact on behavior, rather those students who participated in these programs did not have differing levels of abstinence from sexual activity than those in a comprehensive program (Trenholm et al., 2008). In Kirby's (2007) research on the impact these programs have on the reduction of teen pregnancy, it was concluded that funding should cease as these programs were not meeting their intended goals of impacting teen sexual behavior.

## Summary

In summary, it is important to understand the roles adults have in the developing sexuality and sexual health of children. Between the ages of 0 and 10, children are not only physically changing, but they are also gathering information from a variety of sources about how their sexuality is changing, developing, and evolving. This time of gathering information is an opportunity, on a daily basis, for parents to share their values with their children. Children will also seek out information from a variety of sources, and other adults in a child's life must be prepared to answer those questions in a comfortable and honest

manner. Children need adults in their lives to whom they can trust and turn to for honest answers. Parents must take on the role of their child's primary sexuality educator, and if parents are uncomfortable or need guidance, they should seek out the assistance of a child development professional or their pediatrician. Additional websites and professional organizations for parents, caregivers, educators, and health-care providers are listed below.

**Advocates for Youth:** Champions efforts that help young people make informed and responsible decisions about their reproductive and sexual health (<http://www.advocatesforyouth.org>)

**American Academy of Pediatrics:** Organization of over 60,000 pediatricians dedicated to the attainment of optimal health for infants, children, adolescents and young adults ([www.aap.org](http://www.aap.org))

**National Association for the Education of Young Children:** Serve and act on behalf of the needs, rights, and well-being of all young children with primary focus on the provision of educational and developmental services and resources (<http://www.naeyc.org/>)

**Sexuality Information Education Council of the United States:** Provide education and information about sexuality and sexual and reproductive health ([www.siecus.org](http://www.siecus.org))

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## Sibling Relationships During Childhood

Michelle L. Hostetler<sup>1</sup> and Mark E. Feinberg<sup>2</sup>

<sup>1</sup>Edna Bennett Pierce Prevention Research Center, The Pennsylvania State University, University Park, PA, USA

<sup>2</sup>Prevention Research Center, The Pennsylvania State University, University Park, PA, USA

Relatively little research has been conducted on sibling relationships, especially considering the large volume of research on other key family relationships, such as parent–child and marital relationships. The daily companionship of childhood siblings and the lifelong nature of sibling bonds, combined with the intense positive and negative emotional nature of sibling relations, yield a family relationship whose power and importance has often been overlooked by scholars and practitioners. However, a growing body of research is emerging that illustrates the impact sibling relationships have on individual development and family functioning, making the sibling relationship an appealing target for future research and prevention efforts.

### Scope

The vast majority of children in the United States grow up in households with at least one sibling (Hernandez, 1997), and US children are more likely to grow up in a household with a sibling than with a father (McHale & Crouter, 2005). Sibling relationships are often the longest lasting relationships in one's life and are typically emotionally intense in both positive and negative ways. Moreover, children spend more of their free time with siblings than with parents or peers (McHale & Crouter, 1996; Updegraff, McHale, Whiteman, Thayer, & Delgado, 2005).

Given these factors, it is not surprising that siblings and sibling relationships have a strong influence on a wide range of child and adolescent

mental and behavioral health outcomes, such as depression, academic performance, peer and romantic relationship quality, conduct problems, and substance use (Feinberg, Solmeyer, & McHale, 2012). The influence of siblings persists throughout the lifespan into old age (Waldinger, Vaillant, & Orav, 2007). Siblings provide a key context for learning fundamental social skills beginning in early childhood, but sibling conflict and aggression can be problematic. Observational research has documented the occurrence of sibling conflict at a rate of up to eight times per hour (Berndt & Bulleit, 1985; Dunn & Munn, 1986), and sibling aggression is common, with 70 % of families reporting physical violence between siblings (Steinmetz, Straus, & Gelles, 1981). Indeed, sibling violence occurs more frequently than other forms of child abuse (Button & Gealt, 2009). Negative sibling relationships are one of the most significant challenges for parents, and the parental stress that results from chronic sibling conflict may contribute to ineffective parenting and diminished parental well-being, which can have profound impacts on the entire family system.

### Theories

In a recent review of theoretical perspectives and research on sibling relationships, Whiteman, McHale, and Soli (2011) noted that sibling relationships are multidimensional and vary across time and space, making it unlikely that a single theory can explain all the developmental, family, and group differences found in sibling relationships. Most research on sibling relationships to date has been guided by three theoretical frameworks: social learning theory, social comparison theory, and family systems theory.

Social learning theory centers on the idea that individuals learn new behaviors and attitudes through reinforcement and observing others (Bandura, 1977). For example, children learn social competencies from their interactions with parents and siblings. Most of the sibling research in social learning focuses on how siblings influence one another's individual adjustment, especially conduct problems, substance use, and risky



sexual practices through the processes of reinforcement and modeling. Patterson and colleague's (1984) coercive processes model theorizes that repeated negativity and coercion in the sibling relationship is internalized over time into an entrenched pattern of behavior and then generalized to interactions with peers and others. Some research has also examined how sibling's reinforcement of each other's deviant talk or behavior can promote negative adjustment (Bullock & Dishion, 2002).

According to social comparison theory, people evaluate themselves based on comparisons with other individuals in their immediate environments and are driven by the motivation to enhance one's self-esteem (Festinger, 1954). Given that siblings must share parental attention and love, they can view each other as competitors such that a gain in parental recognition for one is experienced as a loss for the other. Sibling research within the social comparison framework includes work on the ways that parental differential treatment (PDT) of siblings can affect children's adjustment (McHale, Updegraff, Jackson-Newsom, Tucker, & Crouter, 2000) – especially if PDT is considered unfair – and the ways that siblings may seek to differentiate themselves to create separate niches in which to attract recognition and praise (Feinberg, McHale, Crouter, & Cumsille, 2003).

According to family systems theory (Minuchin, 1985), individual development must be considered within the context of family relationships. Sibling research within this perspective focuses on the reciprocal influences of individual adjustment, the dynamics of the sibling subsystem, and the interplay with other family subsystems (e.g., marital and parent–child relations).

## Research

Research on sibling influence generally focuses on two broad questions: (1) What are the processes that make two children from the same family similar or dissimilar from one another? (2) What factors influence sibling relationship quality, and what dimensions of sibling relationships help

shape individual development and psychosocial adjustment? Studying sibling relationships is complex due in part to the range of structural features that define these relationships, e.g., gender constellation, age and age spacing, biological relatedness, as well as the dyad's place in the overall family constellation of siblings.

## Social Learning Sibling Research

Most sibling research in the social learning area has focused on how siblings influence one another's individual adjustment, including conduct problems, substance use, and risky sexual practices. Researchers have documented a number of links between mental and behavioral health of one sibling and those of the other. For example, Shortt, Stoolmiller, Smith-Shine, Mark Eddy, and Sheeber (2010) reported that older siblings' externalizing behavior was associated with increased externalizing behavior in the younger sibling over time. And researchers have found moderately strong positive associations between levels of siblings' substance use (Epstein, Bang, & Botvin, 2007; Pomery et al., 2005; Rende, Slomkowski, Lloyd-Richardson, & Niaura, 2005), which are often interpreted as evidence of social learning through modeling and reinforcement. Because siblings can learn that escalating negativity in sibling interaction often leads to getting their way, sibling relationships have been described as a training ground for aggression (Patterson, 1986). Siblings may also promote each other's negative behavior through reinforcement of deviant talk (Bullock & Dishion, 2002). It is not surprising, then, that hostility, aggression, and violence between siblings also predict antisocial behavior and substance use, in some reports, beyond what is accounted for by parent–child and peer relationships (Bank, Burraston, & Snyder, 2004; Brody et al., 2003; Conger & Conger, 1994; Garcia, Shaw, Winslow, & Yaggi, 2000; Snyder, Bank, & Burraston, 2005).

## Social Comparison and Differentiation Sibling Research

Only a handful of studies assess sibling differentiation and social comparison processes, such as

the ways that siblings react to parental differential treatment (PDT). Research indicates that parental differential treatment of siblings is common across the life span (McHale & Crouter, 2003). Evidence suggests that parental differential treatment is linked to less positive sibling relationships from early childhood through adolescence (Shanahan, McHale, Crouter, & Osgood, 2008), with the disfavored sibling showing higher levels of depression (Feinberg & Hetherington, 2001), antisocial, and delinquent behavior (Richmond, Stocker, & Rienks, 2005), including substance use. Children's own perceptions of fairness or unfairness in PDT is an important moderator of the effects of PDT (Kowal, Kramer, Krull, & Crick, 2002; McHale et al., 2000).

Parents often cite differences in children's behavior, personality, and needs as motivation for treating their children differently (McHale & Crouter, 2003). Indeed, the direction of effect between PDT and sibling characteristics must be considered given evidence that, for example, youths' externalizing behaviors have been shown to predict an increase in mother's hostility over time (Richmond & Stocker, 2008). Thus, it is plausible that PDT may also arise as a reaction to existing sibling differences. Family context has also been shown to be related to PDT. For instance, some findings suggest stronger negative effects for girls than for boys and for older than for younger siblings (Feinberg, Neiderhiser, Simmens, Reiss, & Hetherington, 2000). Research on Mexican American families suggests that cultural factors also may be at play: Among adolescents who endorsed the traditional value *familismo* (which highlights concern for the needs and interests of the family above oneself), disfavored sibling status was less strongly linked with risky behavior and depression (McHale, Updegraff, Shanahan, Crouter, & Killoren, 2005). Findings such as these highlight the complexity of sibling relationships and the need to study siblings longitudinally in the context of the larger culture.

### Family Systems Sibling Research

Family systems research studies siblings within the context of broad family processes. A number

of studies have linked sibling relationship quality to marital and parent-child relations, and these links appear to be reciprocal (Kim, McHale, Osgood, & Crouter, 2006; Yu & Gamble, 2008). Early parent-child relationships have been linked to later sibling relationships, with more secure attachment to the mother predicting more positive sibling relationships (Volling, 2001). Not surprisingly, siblings may turn to each other for emotional support during times of marital conflict (Jenkins, 1992). Supportive, close, and warm sibling relationships may buffer the impact of negative influences on individual well-being. For example, Gass, Jenkins, and Dunn (2007) reported that positive sibling relations help buffer youth from the impact of stressful life events. Family systems are not closed but are open to influence by external factors. For example, factors such as socioeconomic status and financial stress have potential to impact marital and parent-child relations, and possibly through these factors the sibling relationship as well (Conger et al., 1992).

### Strategies

How has the existing sibling research been translated into prevention and intervention practices? Research demonstrates that the influences of sibling relationships are extensive, long lasting, and generally stable over time. Such stability indicates that poor childhood sibling relationships do not tend to change into positive ones (although certainly fluctuations and large reversals of sibling dynamics are possible in any single case). Thus, some practitioners and researchers have developed interventions to help children develop positive, prosocial sibling relationships in order to enhance youth developmental outcomes.

Kramer (2010) reviewed the sibling research literature and suggested a number of essential competencies for prosocial sibling relationships in early childhood; these competencies can serve as a list of potential targets for sibling-focused interventions. Individual level skills and factors include social and emotional understanding and perspective taking, emotion regulation, behavioral control, forming neutral or positive attributions, conflict

management, and problem-solving skills. Factors specific to the sibling relationship include positive engagement with each other, cohesion, and shared experiences that build supportive bonds. A family level competency is also suggested – the ability to evaluate parental differential treatment practices as a family and come to a shared understanding of what constitutes fair treatment.

In fostering these underlying competencies, sibling-oriented interventions often seek to enhance parenting given the parents' powerful role in guiding and shaping sibling relations. Intervention programs have been designed to train parents in how to effectively manage sibling relationships to reduce sibling conflict, promote positivity, and improve children's conflict resolution skills (Siddiqui & Ross, 2004). Very few interventions target the sibling dyad itself, typically along with the intervention directed towards parenting practices.

A review by Kramer (2004) identified several gaps in intervention research on sibling relationships: the vast majority of studies target parents (usually mothers) rather than siblings themselves, focus on minimizing problem behaviors and problematic relationship characteristics rather than promoting positive ones, examine small and often clinical samples, fail to include nonintervention comparison groups, assess only immediate but not long-term intervention effects, and have not been disseminated for widespread use.

## What Works?

We define “what works” as three or more well-designed and executed studies on a given method or program. To date, no sibling intervention program meets these criteria. It is expected that sibling research will continue, and evidence-based sibling programs will emerge.

## What Is Promising?

### Parent Mediation Training

Parent mediation training has demonstrated positive outcomes on sibling conflict resolution

for both parents and young children (Siddiqui & Ross, 2004; Smith & Ross, 2007). In Ross's work to date, mediation training involved only the mothers and emphasized allowing children to resolve conflicts themselves, under the guidance of the mothers. Training required 1–1.5 h and covered the four stages of the mediation process: (1) discussing and gaining consent to the ground rules and the roles of each participant, (2) clarifying each disputant's position and interests, (3) developing empathy and understanding, and (4) helping to develop a realistic agreement on the issue. Mothers were also trained in active listening skills such as clarifying, restating, reframing, reflecting, and summarizing and were given the opportunity to watch a video clip of mother-child mediation and to practice with the researcher as part of the training.

A randomized trial of the program indicated that mothers who were trained in mediation techniques and asked to mediate their children's disputes talked more about emotions, interests and the negotiation process, provided more information and guidance, and reasoned more than control group mothers, who intervened as usual (Siddiqui & Ross, 2004). Intervention condition children talked more about emotions and negotiation processes, supplied more information about the dispute, and reasoned more than did their control group counterparts. Mediation training also affected who resolved the disputes. Intervention group mothers initiated resolutions less often than control group mothers, younger siblings in the intervention group suggested resolutions more often than younger siblings in the control group, and intervention group siblings had better understanding of their siblings' conflict goals compared to control group siblings.

In a second study, both mothers and fathers in two-parent families received mediation training in their home (Smith & Ross, 2007). Siblings in the intervention group were more constructive during conflict than were those in the control group, talking calmly, sharing perspectives, listening, explaining their actions, apologizing, and suggesting solutions more often than the control group. Mediations produced more compromises, and the mediated conflicts were more often

resolved by children with the parents' help, rather than by the parent alone, as was the case in the control group. The resolutions themselves were more constructive in the intervention group than the resolutions the parents offered in the control group. Children in the intervention group were better able to identify their siblings' goals and emotions, and the younger siblings took a more active role, offering more suggestions and resolutions than the control group younger siblings.

### **Sibling Emotional and Social Competence Training**

There are only a few promising prevention programs in which intervention involves the sibling dyad. The *More Fun with Sisters and Brothers* program (Kennedy & Kramer, 2008) was designed to improve sibling relationship quality among 4–8-year-old siblings by teaching emotional and social competencies and training their parents to support and maintain these skills at home. The program was designed to meet the social demands of 4–8-year-old siblings and targeted competencies such as initiating play with sibling, perspective taking, regulating emotions, problem solving, and conflict management. Skills were taught through modeling, role-playing, performance feedback, and coaching. In order to facilitate the transfer of training to real-life situations, a generalization training session was conducted in each family's home. Sibling dyads in the experimental condition received five 1-h training sessions, four in a lab playroom once a week and the final session in the home. The program showed modest positive effects for increasing sibling warmth and reducing parents' need to intervene around children's emotionality, high activity levels, and misbehavior.

Bank, Kothari, Snyder, Wilson, and Feingold (2011) have focused on siblings at elevated risk for antisocial behavior and conduct problems. Grounded in a social learning approach, Bank and colleagues (2011) tested a sibling relationship intervention for dyads in which the older sibling evidenced significant antisocial behavior. Sibling pairs attended eight sessions that focused on enhancing their relationship, fostering each

sibling's socially skilled behavior, and reducing conflict and aggression. The sibling intervention was embedded in parent management training as a whole family approach. Parents were provided with information about what was taught in each session and coached in how to support and reinforce their children's practice of behaviors at home.

Bank and colleagues (2011) compared families who received only parent management training (PMT) and families who received only community partner training (CPT) to families who received PMT in conjunction with the sibling dyad intervention (SPMT) to test the effects of the sibling intervention. After the intervention, older siblings in the SPMT condition were reported by teachers to demonstrate reduced conduct problems and were coded by observers as less negative on the school playground compared to both PMT and CPT children. At the end of the intervention, older siblings in the SPMT group had a 70 % reduction in observed frequency of negative interaction on the school playground, which was significantly larger than the reductions seen in PMT or CPT groups. Results were not as strong for younger siblings and were not maintained at the 18-month follow-up, though patterns of improvement were stable. This work has been submitted but not yet published in a peer-review publication.

Feinberg and colleagues (2013) conducted a randomized control pilot of *Siblings are Special (SAS)*, a universal program that targets both sibling relationship and parenting mediating processes in middle childhood to prevent behavior problems in adolescence. The after-school program consisted of 12 weekly group sessions for each group of four sibling dyads, delivered by two trained group leaders. The sessions included limited didactic presentation, active games, some written exercises, role-playing, and discussion. Three "family fun night" sessions were scheduled to be evenly spaced throughout the 12 after-school sessions and the entire family was encouraged to participate. In the preliminary analysis based on the first cohort of families, program families had positive outcomes in several areas, including more sibling fair play, higher sibling

social competence, lower mother depressive symptoms, and lower mother involvement in sibling conflicts compared to control families (Solmeyer et al., 2010).

Thomas and Roberts (2009) trained 4–8-year-old children in sibling conflict resolution skills in a series of five clinic training sessions. All participating children had at least one sibling within 3 years of their age, but only one child was trained. Children who were trained improved their repertoire of verbal reasoning, assertiveness, and acceptance to solve sibling conflicts, whereas children in the control condition did not change over the same time period. Parents reported improved social competence in the home for children in the training condition but not for those in the control condition. The sample size in this study was very small, only 10 children in each condition, but the study does suggest that social competence and sibling conflict resolution skills can be successfully taught to young children.

### What Does Not Work?

We have not found any studies that have conclusively demonstrated that certain practices or interventions do not foster positive sibling relationships.

### Summary

Given the recency of intervention and research interest in sibling relationships, it is not entirely surprising that no sibling intervention program to date has been able to demonstrate effectiveness in three or more well-designed research trials. However, it is likely that research will continue and that program developers will continue to explore ways to leverage the power of the sibling relationship to improve individual and family functioning. Ideally, sibling intervention programs will be designed to improve one or more of the competencies outlined by Kramer (2010) as essential for prosocial sibling relationships. Future sibling interventions could focus on common family transition periods in order to improve

their impact. There is evidence that the family system is more open to changes during transition periods, such as transition to adolescence (Kim et al., 2006), parental divorce (Sheehan, Darlington, Noller, & Feeney, 2004), and the transition period when the first born sibling moves out of the family home (Whiteman, McHale, & Crouter, 2011). At this point in time, the most promising prevention programs for improving sibling relationships focus on parent mediation training and/or emotional and social competence training.

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## Social and Emotional Learning During Early Childhood

Susanne A. Denham<sup>1</sup> and Katherine M. Zinsler<sup>2</sup>

<sup>1</sup>Department of Psychology MS 3F5, George Mason University, Fairfax, VA, USA

<sup>2</sup>Department of Psychology, University of Illinois at Chicago, Chicago, IL, USA

### Introduction

Social and emotional aspects of preschoolers' development are crucial for their concurrent and later well-being and mental health, as well as their learning and early school success (Denham, 2006). As Zins, Bloodworth, Weissberg, and Walberg (2007) have noted, "schools are social places, and learning is a social process" (p. 191). Even young students learn alongside and in collaboration with teachers and peers and must be able to utilize their emotions to facilitate learning. A child's abilities to understand emotions of self and others; regulate emotion, attention, and behavior; make good decisions regarding social problems; express healthy emotions; and engage in a range of prosocial behaviors – their social-emotional learning (SEL) skills – all work together to grease the cogs of a successful school experience and facilitate satisfying relationships with others (Denham, Brown, and Domitrovich, 2010). But SEL success may not be easy for children just entering pre-academic and academic settings, because preschool and kindergarten contexts are taxing for them to navigate – they must learn to sit still, attend, follow directions, and master group play, all very challenging tasks! Unfortunately, many children have deficits in these skills by school entry (Rimm-Kaufman, Pianta, & Cox, 2000).

### Definitions and Scope

*Emotional competence* has recently been acknowledged for its central role in the development of pathways to social competence, to school

success, and to mental health and risk, from foundations laid during preschool and early primary grades. Emotional competence includes expressing emotions that are, or are not, experienced, regulating emotions in ways that are age and socially appropriate, and decoding these processes in others (Halberstadt, Denham, and Dunsmore, 2001). More specifically, emotionally competent children purposefully express a broad variety of emotions without incapacitating intensity or duration. They understand the emotions of themselves and others, and they regulate their emotions when feeling or expressing "too much" or "too little."

*Social competence*, the result of organized behaviors that meet short- and long-term developmental needs, can be summarized as effectiveness in interaction (Rose-Krasnor, 1997). Such social competence in the early years has been recognized as key to school success and satisfying relationships. In the case of preschoolers, socially competent behaviors are organized around the developmental tasks of positive engagement in developmentally appropriate activities in the physical, social, and cognitive/attentional environment, and self-regulation during peer interaction. Given this overarching definition and specific developmental tasks, social competence during early childhood includes very specific abilities, behaviors, and motivations, such as initiation of peer interaction, response to provocation, cooperativeness, empathy, inhibition of aggression, and positive demeanor during interaction.

*Social and emotional learning (SEL)* refers to the constituents of both emotional and social competence, as promoted by parents, early childhood educators, and preventionists. Thus, the skills of emotional competence are essential for social competence, and the specific abilities we want to promote include all elements of emotional and social competence.

As already noted, the presence of emotional or social competence (i.e., SEL) during early childhood is related to contemporaneous and later success in school – both with peers and academically. Such success, indexed by peer status (i.e., overall popularity, rejection, or isolation),

friendship, and school success, is in turn related to later well-being and successful negotiation of developmental tasks into adulthood.

### SEL Theory

At the center of our theoretical framework are the core SEL skills that contribute to children's school success and other important outcomes. These primarily individual skills are vital contributors to ultimately successful, effective interactions with other people and other associated age-appropriate tasks. SEL skills can be located in five domains (Payton et al., 2000; see also <http://casel.org/why-it-matters/what-is-sel/>). These domains include both observable behaviors and internal processes, such as perceptions or beliefs. Some of these domains are self-oriented while others are relational in nature. These domains are:

- *Self-management* includes regulating one's emotional experience and expression in productive ways, being aware of feelings, monitoring them, and modifying them when necessary, so that they aid rather than impede the child's ability to cope with varying situations. Important nonemotional aspects of self-management also are crucial to success in early childhood; these include executive function skills (e.g., working memory, attention, and inhibitory control), used in the service of regulating both SEL and academic behavior.
- *Self-awareness* refers to abilities to accurately assess personal feelings, interests, values, and strengths, and maintaining a well-grounded sense of self-confidence. Preschoolers have a well-defined, stable sense of self, but much development in this area occurs later. The ability to identify and label one's own feelings does develop during early childhood, via an increasingly broad and rich emotion vocabulary (Denham, 2006).
- *Social awareness* includes understanding the feelings of others, being able to take their perspective and empathize with these feelings, as well as recognizing and appreciating individual and group similarities and differences. Emotion knowledge is key – children constantly attempt to understand their own and

others' behavior, and emotions convey critical interpersonal information that enhances such understanding while guiding interaction. Inability to interpret emotions can make the classroom a confusing, overwhelming place.

- *Relationship skills* include establishing and maintaining positive and effective exchanges with others and, ultimately, healthy and rewarding relationships that last over time. Numerous skills are crucial in this domain, including making positive overtures to play with others, initiating and maintaining conversations, cooperating, listening, taking turns, seeking help when needed, and developing friendship skills (e.g., joining another child or small group, expressing appreciation, negotiating, and giving feedback). In addition, asserting oneself; preventing, managing, and resolving interpersonal conflict; and addressing others' needs through negotiation develop during the preschool-to-primary period.
- *Responsible decision-making* includes making decisions, in both social and academic situations, based on consideration of ethical standards, safety concerns, appropriate social/moral norms, respect for others, and likely consequences of various actions. This domain of SEL becomes important as children's everyday social interactions increase in frequency and complexity. They must learn to solve social problems – to analyze social situations, identify problems, set prosocial goals, and determine effective ways to solve differences that arise within their peer group.

### Current Research

Each SEL competency has its own theoretical traditions and voluminous empirical literatures on its links with developmentally appropriate conceptions of children's social and school success. These include children's (1) overall social competence; (2) classroom learning behaviors, approaches to learning, and feelings about school; and (3) achievement, particularly in preliterary, pre-numeracy, reading, and

mathematics, as well as grades and other aspects of the school experience (e.g., retentions, disciplinary referrals).

*Self-management* is related to social/classroom adjustment and academic achievement (Bierman, Nix, Greenberg, Blair, & Domitrovich, 2008; Denham et al., 2003). Children less able to deal with negative emotions may not have personal resources to focus on learning, whereas those who can maintain a positive emotional tone might be able to remain positively engaged with classroom tasks (Trentacosta & Izard, 2007).

More cognitive/behavioral forms of regulation are also related to young children's academic success. Young children's abilities to carry out complex directions, finish tasks, and to concentrate are directly related to kindergarten achievement, for example (Howse, Calkins, Anastopoulos, Keane, & Shelton, 2003). Furthermore, Liew, McTigue, Barrois, and Hughes (2008) found that first-grade inhibitory control (e.g., being able to walk on a line and trace a star) predicted third grade reading scores (see also Ponitz, McClelland, Matthews, & Morrison, 2009).

The components of *self-awareness* are related to positive child outcomes, with the strongest findings for academic outcomes in parallel domain areas. For example, Marsh, Ellis, and Craven (2002) found positive associations between preschoolers' academic self-concepts and achievement. Preschoolers' self-perceptions of achievement motivation during were correlated with reading and math scores in 1st grade (Measelle, Ablow, Cowan, & Cowan, 1998). Few research reports focus on children's conceptions of their own emotions and such outcomes.

Young children's *social awareness*, their emotion knowledge, contributes to their overall social competence; it is related to their positive peer status and prosocial reactions to peers' and adults' emotions (Denham et al., 2003). Research by Izard and colleagues (e.g., Izard et al., 2001) corroborates these assertions: Head Start children's emotion knowledge predicted both contemporaneous and later teacher reports of social functioning.

Increasingly, researchers are also confirming a link between early academic success and young children's emotion knowledge. Leerkes, Paradise, O'Brien, Calkins, and Lange (2008) showed that emotion knowledge – but not emotion regulation – was related to preschoolers' pre-academic achievement. Similarly, Izard and colleagues (2001) found strong evidence that 5-year-olds' emotion knowledge predicted both their age 9 social and academic competence. Thus, it is evident that children's ability to understand emotions, especially in context, plays an important role in their concurrent and later academic success.

Links have been found between *social problem-solving* and both social and academic success, as well as the advantages of specifically *prosocial* problem solutions (e.g., Denham & Almeida, 1987; Youngstrom et al., 2000). Specifically, specific aspects of social problem-solving are related to preschoolers' social competence and behavior problems (Coy, Speltz, DeKlyen, & Jones, 2001). Children's emotional and behavioral responses to hypothetical peer dilemmas were related to teachers' concurrent and later assessments of school adjustment and their kindergarten academic progress (Bierman, Domitrovich, et al., 2008).

Children with poorer *relationship skills* are more likely to have social difficulties and thus, indirectly, with school adjustment. Unpacking this indirect relation, Normandeau and Guay (1998) have found that kindergartners' prosocial behavior predicts their cognitive self-control in 1st grade, which then predicts 1st grade achievement.

Numerous researchers have found that the social skills constituting this component of SEL are even directly related to early academic success. Elias and Haynes (2008) showed that initial social competence and improvements in social competence (i.e., cooperation, self-control, and assertion) predicted third graders' end-of-year grades in reading and mathematics. Relationship skills play significant roles in predicting promotion and retention after 1st grade (Agostin & Bain, 1997). In fact, children with relationship skills are at increased risk of dropout. Thus, social

behaviors appear to form a solid foundation for early school success.

## Overview of Strategies

The foregoing discussion boldly underscores the importance of SEL for children's success at important developmental tasks. Concurrently, young children who master developmentally appropriate facets of SEL are better equipped to be invested in play, initiate peer interaction, and master preliteracy and numeracy skills. They feel better about themselves and succeed in many age-appropriate experiences. Their SEL also predicts success at the next level of developmental tasks as they enter school – thriving academically and in the demanding world of peers. Early SEL attainment set them on a course for even later well-being, mental health, and other positive outcomes.

Because of this crucial nature of early childhood SEL and the considerable risk associated with their lack, there has been a call for primary prevention programs targeted at preschoolers' emotional and social competence needs. For those at special risk and for children in general, the learning of emotional and social competence should not be left to chance. In fact, theoretical and empirical evidence reviewed so far suggests the utility of universal prevention programming to maximize young children's short- and long-term relationship and academic success. Efforts to provide programs focusing on these goals for preschool children are increasing, although historically early childhood educators' concerns with SEL often remain implicit.

What overarching principles can inform prevention programs to promote SEL and deter early behavior problems and their sequelae? Durlak and colleagues' meta-analyses (Durlak & Wells, 1997; Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011) provide guidelines for successful prevention programs. First, programs must work from a theoretical perspective and implement specific, SEL-focused strategies to alter developmental trajectories. Durlak et al. (2011, p. 410; see also Denham & Burton,

2003; Elias, Zins, Graczyk, & Weissberg, 2003) note that these strategies should be executed using a “connected and coordinated set of activities,” using active, varied, and engaging learning approaches. Such components must be monitored for effective implementation (Elias et al., 2003). Intervening in multiple contexts is necessary, to facilitate both person-centered and environmental change by involving peers, parents, teachers, principals and other personnel, and school district leaders. SEL should become a goal for the school's entire climate and a key element in learning standards of the system. Further, to be effective, programs should span multiple years. Realistically, it takes time to assist development and change existing behavior patterns. To be able to evaluate the effectiveness of programs, experimental or quasi-experimental designs should be utilized, and the fidelity and dosage of implementation must be specified. Finally, “the earlier the better” are the watchwords for primary prevention of deficits in social and emotional learning.

Although the focus of the preceding discussions of strategies and following review of effective programming is the universal promotion of SEL among young children, it is important to recognize other, more targeted ways of promoting SEL as well. Current strategic thinking has broadened from the blanket intervention approach to include a “Teaching Pyramid” model with a multitiered approach to programming (Hemmeter, Ostrosky, & Fox, 2006). The four components of the Teaching Pyramid move from a foundation of building positive relationships with children, families, and colleagues, to designing supportive and engaging environments, then teaching social and emotional skills within these environments, and, when necessary, developing individualized interventions for children with the most challenging behavior. At the same time, the pyramid's early education programs' efforts at promoting SEL are implemented at four multitiered levels of service, which *universal* promotion strategies to promote SEL for all children, *selected* prevention strategies for addressing the SEL instructional needs of children at risk for challenging behavior, and *targeted* implementation of assessment-based

behavior support plans for children with persistent challenging behavior.

At the top level of the Teaching Pyramid, young children show difficulties in SEL and need careful assessment, intervention, and monitoring to achieve cessation of difficult behaviors and increases in SEL. The process used to develop such assessment-based plans for the individualized intervention to improve persistent challenging behavior (i.e., at the selected or targeted level) is described as positive behavior support (PBS; Dunlap & Fox, 1996). The individualized application of PBS is an effective process that includes functional behavioral assessment, individualized behavior support plans appropriate for implementation by caregivers and professionals within natural contexts, and response to intervention (RTI) assessment informing further refinement of support plans.

Although the Teaching Pyramid puts forward a blueprint for SEL promotion and problem behavior cessation that could fit all children during early childhood and acknowledges many of the issues mentioned by Durlak et al. (1997, 2011), it and the PBS/RTI approaches originate in special education contexts. As such, their potential broader usefulness is only partially realized. These approaches have not as yet fully integrated the lessons from basic science on SEL and the accompanying universal and targeted applications that will be described here.

## What Works

There are relatively few programs that fully and directly address the promotion of SEL during early childhood, according to the guidelines set out by Durlak and colleagues (1997, 2011). Fewer still have been rigorously and systematically evaluated, and only some of these can be seen as effective (Joseph & Strain, 2003). However, efforts are mounting to identify more clearly the elements of effective and promising programming. For example, The Head Start CARES (Classroom-based Approaches and Resources for Emotion and Social skill promotion; MDRC, 2012) project is currently using

a randomized design to test the effects of four evidence-based strategies designed to improve children's SEL in Head Start classrooms. We will focus here on two programs whose effectiveness in increasing SEL in young children has been supported by multiple rigorous studies: Promoting Alternative Thinking Strategies (Preschool PATHS) and the Incredible Years curriculum.

*The Preschool PATHS* curriculum is a younger extension of an effective elementary school program (PATHS; Greenberg & Kusché, 1998). Its theoretical underpinnings emphasize that SEL milestones do not unfold automatically; on the contrary, they are heavily influenced, even at the neuronal level, by environmental inputs throughout early childhood. This curriculum is grounded in the understanding that much of the individual variation in the components of children's emotional competence derives from experiences within the family and preschool classroom. Hence, this SEL programming maximizes the environmental conditions that nurture and reward the development and application of SEL skills.

The preschool version of PATHS delivers 30 "circle time" lessons to promote social and emotional competences including compliments, basic and advanced feelings, problem-solving, and the "Turtle Technique" to increase preschoolers' self-control. As with the original PATHS program for older children, the preschool curriculum aims to develop children's awareness of their own and other's emotions, teach self-control, increase children's self-concept and peer relations, develop problem-solving skills, and create an overall positive classroom environment supporting SEL. Crucial to the success of the PATHS curriculum is the training of teachers to use extension activities and integrate PATHS concepts throughout the preschool day. Children's learning and use of newly acquired social-emotional skills are scaffolded by teachers throughout the day whenever they experience an emotional reaction or a challenging situation.

The original curriculum was evaluated multiple times with elementary school samples. The Conduct Problems Prevention Research Group study (1999) showed significant differences



between the control group and the PATHS group in peer-related aggression, teacher's ratings of conduct problems, and overall positive classroom atmosphere. A second study by Kam, Greenberg, and Kusché (2004) used a randomized control methodology to find that children participating in the PATH curriculum were more likely to demonstrate self-control and choose non-confrontational solutions to peer problems, had a larger affective vocabulary, and were less likely to be rated by their teachers as displaying internalizing and externalizing behavior problems. Finally, the preschool version of the PATHS curriculum (Domitrovich, Cortes, & Greenberg, 2007) increased children's emotion knowledge, social skills, social competence, and social independence and decreased social withdrawal when compared to the control group.

*The Incredible Years* curriculum spans both age and contexts to reduce challenging behaviors in children from infancy to early adolescence by reinforcing programmatic themes both in school and at home. The program integrates parent education on play interaction and relationship skills, teacher training workshops on classroom management techniques and promoting children's prosocial behavior, and child training emphasizing empathy, emotional literacy, problem-solving, and self-control. The Incredible Years curriculum is grounded in social learning theory and recognizes the value of adults modeling appropriate interactions and behaviors for children's development; thus the program incorporates both the home and school environments in the positive socialization process (The Incredible Years Inc., 2012).

Posttests immediately following the conclusion of the program (Webster-Stratton, Reid, & Hammond, 2004) have shown decreases in mother's negative parenting, improvements in child conduct problems at home and at school, and improvements in social competence with peers when compared to the control groups. Working with a sample of preschoolers at risk for antisocial behavior, Brotman et al. (2005) found improvements in families' provision of stimulation for learning and children's engaging behaviors in the treatment groups in addition to

replicating the decreases in negative parenting behaviors previously discussed. Finally, Webster-Stratton, Reid, and Stoolmiller (2008) used a quasi-experimental design with random assignment of Head Start students and found improvements in teaching style, children's school readiness, positive classroom atmosphere, along with positive changes in children's problem-solving skills.

## What Is Promising

The growing recognition, over the past two decades, of SEL's importance during early childhood has led to the development of several promising programs. Following we will discuss four such programs that we believe could be contenders with additional rigorous study – *Al's Pals: Kids Making Healthy Choices*, *I Can Problem Solve*, the *Emotions Course*, and *Second Step*.

*Al's Pals: Kids Making Healthy Choices* (Geller, 1999) is a resilience-based early childhood curriculum and teacher training program that develops social, emotional, and behavioral skills in children 3–8 years old. *Al's Pals* uses twice weekly puppet-based discussions, role playing, songs, and movement to introduce social-emotional skills and decrease precursors to aggressive behavior. An evaluation of the program showed promising results. Lynch, Geller, and Schmidt (2004) conducted a randomized control multiyear trial of the program and found that intervention children received better behavior ratings by teachers. Additionally, teachers rated children lower on problem behavior scales such as antisocial/aggressive, social withdrawal, and anxiety. Although promising, this evaluation relied on teacher reports of child behavior, which the authors acknowledge may be positively biased within the intervention group. The addition of observational measures or direct child assessment will strengthen future evaluations of this curriculum.

The program *I Can Problem Solve (ICPS)*; Shure, 1993) was originally introduced under the name *Interpersonal Cognitive*

Problem-Solving in the 1970s. The three age components (preschool, kindergarten and early elementary, and intermediate elementary) together have been implemented in schools, after-school programs, and community centers. As the name suggests, this program focuses on teaching children a problem-solving vocabulary, to understand their own as well as others' feelings, to think of alternative solutions, and to think through the consequences associated with their action choices. By impacting children's conceptualizations of their conflicts with others, ICPS aims to reduce impulsivity and enhance positive peer relationships.

Several evaluations of ICPS have been conducted over the decades since its original implementation. Positive impacts on cognitive problem-solving have been found immediately following the intervention as well as 6 and 12 months afterwards (Shure & Spivack, 1982). Although differences did not immediately appear in children's problem behaviors, posttests at 1 year and 5 years after participating in the ICPS program showed fewer problem behaviors and better classroom behavior overall (Shure, 1993). In older students, participation in the early elementary school version of ICPS has also been linked to increases in school bonding (Kumpfer, Alvarado, Tait, & Turner, 2002).

However, evaluations of ICPS by its original developers and independent investigators have shown mixed results. Several studies have suffered from poor instrument reliability, missing data, inconsistent adherence to the curriculum, and lack of independent observers and reports (Boyle & Hassett-Walker, 2008; Kumpfer et al., 2002; Shure & Spivack, 1982).

*The Emotion-Based Prevention Program (EBP)* for Head Start children (Izard, Trentacosta, King, & Mostow, 2004; Izard et al., 2008) uses Differential Emotions Theory to teach preschool-aged children how to understand, regulate, and utilize emotions appropriately (i.e., effective and constructive use of emotion motivation, as when modulated, vicarious sadness promotes sympathy). As with other programs discussed, EBP uses puppets, vignettes, storybooks, and interactive reading to help

structure children's learning. Unique to this program is the substantial focus on the four "basic" emotions: happiness, sadness, anger, and fear, as well as its reliance on the intrinsic rewards associated with greater emotional competence (Izard et al., 2008).

This program was first tested by Izard and colleagues in rural Head Start centers (Izard et al., 2004), and then a second study using inner city Head Starts reevaluated the program after some adaptations were made based on previous results. Both studies used randomized controlled trials of the EBP program and study 2 added the comparison of EBP to the established treatment program, I Can Problem Solve (ICPS; Shure, 1993). Results of the two studies were drawn from teacher report, direct child assessment, and independent observation and showed that EBP increased emotion knowledge and regulation in participating children when compared to the control groups. Additionally, EBP had beneficial impacts positive social behaviors in study 2 and on maladaptive and aggressive behaviors in study 1. It is not yet clear why there was variability in the specificity of findings from the two studies (although operationalizations of emotion knowledge and emotion regulation did differ between them); additional research will need to evaluate the final version of the program to determine necessary duration of treatment and implementation feasibility.

*Second Step: A Violence Prevention Curriculum* (Frey, Hirschstein, & Guzzo, 2000) is a school-based universal intervention program developed to reduce aggressive behavior through three separate curricula for preschool/kindergarten, elementary, and middle school children. All three age levels of the programs build on cognitive behavioral intervention models and social learning theory to teach children social-emotional skills to reduce impulsive and aggressive behavior while increasing social competence. Classroom lessons include labeling emotions, managing emotional reactions, decision-making, and choosing positive goals. Younger students are encouraged to interact with the Impulsive Puppy, Slow Down Snail, and Be-Calm Bunny puppets and toys throughout the curriculum.

In elementary and middle school populations, Second Step has been linked to decreases in observed antisocial behavior and increases in prosocial behavior when compared to the control groups (Grossman et al., 1997; Taub, 2002). McMahon, Washburn, Felix, Yakin, & Childrey (2000) examined the effectiveness of the Second Step program in improving social skills knowledge and social competence among urban low-income, ethnically diverse children in pre-school and kindergarten. Teacher ratings, child reports, and observational data were used to assess children's social skills knowledge and social competence over a year. After 1 year of program involvement, children demonstrated increased knowledge of social skills and decreased observed behavioral problems. Although promising, there is limited research evaluating the implementation of Second Step in early childhood classrooms.

### What Does Not Work

The admonitions and recommendations in Durlak and colleagues' meta-analyses (1997, 2011), as well as Denham and Burton's 2003 book and Elias and colleagues' 2003 article, are clear. Early childhood SEL programming takes the planning and commitment of all personnel in childcare programs, preschools, and schools housing kindergartens, as well as careful training, implementation, and evaluation. Short-term programs don't work. Most programs begun now, as opposed to those of the 1970s and 1980s, try to heed this caveat. Isolated behavior modification programs or add-on programming that is not fully integrated into daily activities of classroom are unlikely to succeed in promoting long-lasting social and emotional learning. Similarly, social skills training alone (i.e., teaching children to increase their competence in specific skills but not from an overarching SEL approach) may work, but only in the short term. Long-term impacts of behavior and relationships will only come from incorporating multiple components of SEL consistently across multiple developmental contexts (home, child care, school, etc.) Finally,

behavioral interventions are often methodologically rigorous, showing high effectiveness, but there are definite concerns about ecological validity, fading delivery fidelity, and the generalization of the behavior change as well as its simplistic nature.

### Summary

A case has been made for the importance of SEL during early childhood and thereafter. Further, many necessary qualities of effective SEL programming in early childhood, and several effective programs, have been introduced. Thus, although there is much evidence-based research to support the importance of early childhood SEL, as well as growing support for specific SEL practices during early childhood, even more focused research attention on evaluating effective SEL programming and its successful implementation is needed. Making the need for SEL programming explicit within early childhood education, rather than implicit, is a priority that we can no longer postpone. Governmental and nongovernmental entities alike (e.g., kindergartens within state school systems, private childcare centers) must have standard goals for young children's SEL development and work to meet them. The scientific and education communities are coming together to bring early childhood SEL programming to scale. Our children deserve this care.

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## Social and Emotional Learning: Children

Kimberly A. Schonert-Reichl<sup>1</sup> and  
Roger P. Weissberg<sup>2</sup>

<sup>1</sup>Department of Educational and Counseling Psychology, and Special Education, University of British Columbia, Vancouver, BC, Canada

<sup>2</sup>Department of Psychology (MC 285), University of Illinois at Chicago, Chicago, IL, USA

### Introduction

A fundamental mission of schools is to educate children and youth to master essential subject content areas such as reading, writing, math, science, and social studies. In addition, there is a general consensus among educators, students, parents, and the public at large for a more comprehensive vision of education – one that includes an explicit focus on educating “the whole child” and fostering a wide range of life skills, dispositions, and knowledge including social and emotional competencies, character, and social responsibility (Association for Supervision and Curriculum Development, 2007; Bushaw & Lopez, 2013; Greenberg et al., 2003). In other words, in addition to promoting academic skills, schools have a role in preparing students to graduate with the capacities to get along with others in social and emotionally skilled ways, to practice healthy behaviors, and to make decisions in responsible ways. In the face of current societal, economic, environmental, and social challenges, enhancing these intrapersonal and interpersonal competencies is more critical than ever before with business and political leaders urging schools

to pay more attention to equipping students with skills such as problem solving, critical thinking, communication, collaboration, and self-management – or “twenty-first century skills” (Heckman, 2007; National Research Council, 2012). For students to achieve their full potential as adult citizens in a pluralistic society and to be prepared for their future roles as employees, parents, and volunteers, high-quality education must provide explicit and intentional attention to helping students develop the necessary skills they need to be successful in school and in life.

One approach that has been suggested as a way to improve students’ success is through universal school-based approaches designed to promote students’ social and emotional competencies that are integrated into the day-to-day interactions of students, teachers, and staff in ways that are meaningful, consistent, and embedded into the contexts of classrooms and schools. This entry profiles contemporary research and theory on social and emotional learning (SEL), the evidence-base that links SEL with student well-being and school success, and the practices and strategies that can be used to promote SEL.

### Defining Social and Emotional Learning

Social and emotional learning, or SEL, involves the processes through which individuals acquire and effectively apply the knowledge, attitudes, and skills necessary to understand and manage their emotions, feel and show empathy for others, establish and achieve positive goals, develop and maintain positive relationships, and make responsible decisions (Collaborative for Academic, Social, and Emotional Learning, 2013; Weissberg, Payton, O’Brien, & Munro, 2007). That is, SEL teaches the personal and interpersonal skills we all need to handle ourselves, our relationships, and our work effectively and ethically.

Historically, SEL has been characterized in a variety of ways, often being used as an organizing framework for an array of promotion and prevention efforts in education and developmental science, including conflict resolution, cooperative learning, bullying prevention, and positive

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youth development (Devaney, O'Brien, Resnik, Keister, & Weissberg, 2006; Elias et al., 1997). SEL builds from work in child development, classroom management, prevention, and emerging knowledge about the role of the brain in self-awareness, empathy, social-cognitive growth (e.g., Gallese & Goldman, 1998; Greenberg, 2006), and focuses on the skills that allow children to calm themselves when angry, make friends, resolve conflicts respectfully, and make ethical and safe choices. Moreover, SEL offers educators, families, and communities relevant strategies and practices to better prepare students for "the tests of life, not a life of tests" (Elias, 2001, p. 40). SEL is sometimes called "the missing piece," because it represents a part of education that is inextricably linked to school success, but has not been explicitly stated or given much attention until recently.

Since 1994, the Collaborative for Academic, Social, and Emotional Learning (CASEL) ([www.casel.org](http://www.casel.org)), a nonprofit organization in Chicago, IL, has been at the forefront in North American and international efforts to promote SEL. Since its inception, CASEL has defined SEL more specifically and has served as a guide to school-based SEL programming (CASEL, 2003). Based on extensive research, CASEL (2013) has identified five interrelated sets of cognitive, affective, and behavioral competencies that are central to SEL.

**Self-Awareness:** The ability to accurately recognize one's feelings and thoughts and their influence on behaviors. This includes accurately assessing one's strengths and limitations, and possessing a well-grounded sense of confidence and optimism.

**Self-Management:** The ability to regulate one's emotions, thoughts, and behaviors in different situations. This includes delaying gratification, managing stress, controlling impulses, motivating oneself, and setting and working toward achieving personal and academic goals.

**Social Awareness:** The ability to take the perspective of and empathize with others from diverse backgrounds and cultures, to understand social and ethical norms for behavior, and to

recognize family, school, and community resources and supports.

**Relationship Skills:** The ability to establish and maintain healthy and rewarding relationships with diverse individuals and groups. This includes communicating clearly, listening actively, cooperating, resisting inappropriate social pressure, negotiating conflict constructively, and seeking help when needed.

**Responsible Decision Making:** The ability to make constructive choices about personal behavior, social interactions, and school and life expectations based on consideration of ethical standards, safety concerns, social norms, realistic evaluation of consequences of various actions, and the well-being of self and others.

Although page limitations preclude a comprehensive review of the existing SEL literature, the past decade has witnessed a surge in the number of excellent books and reviews on SEL and we encourage the reader to explore these for further information (for books on SEL see: Elias, 2003; Elias & Arnold, 2006; Elias et al., 1997; Humphrey, 2013; Merrell & Gueldner, 2010; Zins, Weissberg, Wang, & Walberg, 2004; for articles/reports, see: Denham & Weissberg, 2004; Elbertson, Brackett, & Weissberg, 2010; Greenberg, 2010; Jones & Bouffard, 2012; Kress & Elias, 2006; Lantieri & Nambler, 2012; Payton et al., 2000; Schonert-Reichl & Hymel, 2007; Schonert-Reichl & Utne O'Brien, 2012; Zins & Elias, 2006).

## Theories of Social and Emotional Learning

Given that SEL has been characterized and defined in a multitude of ways (Humphrey, 2013), it comes as no surprise that SEL programs and approaches are founded on a variety of theoretical perspectives. Several program developers cite social learning theory (Bandura, 1977) as the foundation for their SEL program, while others indicate that their programs draw from social-cognitive (Coie & Dodge, 1998) or cognitive-behavioral approaches (Tobler et al., 2000). Several SEL programs draw

from research and theory in the area of emotional intelligence (e.g., Goleman, 1995; Mayer & Salovey, 1997) and hence are predicated on the notion the capacity to process, reason about, and use emotion can enhance cognitive activities, such as thinking and decision making, facilitate the development and maintenance of social relationships, and promote personal growth and well-being (Brackett, Rivers, Reyes, & Salovey, 2012). SEL programming also draws from theories that emphasize the primacy of *relationships* (Ainsworth & Bowlby, 1991; Ryan & Deci, 2000) and is based on the understanding that learning is a social process – that is, students’ learning occurs in collaboration with their teachers and in interactions with their peers, and that the best learning emerges in the context of supportive relationships that make learning challenging, engaging, and meaningful.

As can be surmised, SEL includes both an *environmental focus* and a *person-centered focus* (Zins et al., 2004). Hence, in addition to focusing on specific instruction in social and emotional skills, SEL is a process of creating a school and classroom community that is caring, supportive, and responsive to students’ needs. Indeed, effective SEL interventions and skill development should occur in an environment that is safe, caring, supportive, and well-managed, an environment that supports a child’s development and provides opportunities for practicing the skills. Issues including communication styles, high performance expectations, classroom structures and rules, school organizational climate, commitment to the academic success of all students, district policies, teacher social and emotional competence (Jennings & Greenberg, 2009), and openness to parental and community involvement are all important components of an SEL approach.

In a recent and excellent review of SEL theory and practice, Jones and Bouffard (2012) have put forth a conceptual model that draws from “developmental-contextual models” (Bronfenbrenner & Morris, 1998) of human development that takes into account the nested and interactive layers of influences on development from those ecologies in which the child

directly interacts (e.g., family, peer systems, classrooms, school), and proceeding to increasingly distant levels of influence (e.g., culture and political contexts). At the center of their model are core SEL skills that Jones and Bouffard (2012) have categorized into three conceptual domains: emotional processes, social/interpersonal skills, and cognitive regulation. These, in turn, are seen as having both short- and long-term outcomes on academic achievement, behavioral adjustment, and emotional health and well-being.

### Research Demonstrating the Effectiveness of SEL Programs

What does the research say about the effectiveness of SEL programs? At present, some of the most compelling evidence in support of the effectiveness of SEL in demonstrating improvements in *both* social and emotional skills and academics comes in the form of a meta-analysis conducted by Durlak and colleagues (2011). Durlak, Weissberg, Dymnicki, Taylor and Schellinger (2011) located 213 studies that included 270,034 students aged 5–18 without any identified adjustment or learning problems, included a control group, and that reported sufficient data to allow calculation of effect sizes (an index that provides information on the magnitude of the relationship). Almost half (47 %) of the studies employed randomized designs. More than half (56 %) were implemented in elementary school, 31 % in middle school, and the remainder in high school. The majority were classroom based, delivered either by teachers (53 %) or by personnel from outside the school (21 %). Most of the programs (77 %) lasted less than a year, 11 % lasted 1–2 years, and 12 % lasted more than 2 years.

Durlak et al. (2011) analyzed the effectiveness of these school-based programs in terms of six student outcomes in the cognitive as well as intrapersonal and interpersonal domains: social and emotional skills, attitudes toward self and others, positive social behaviors, conduct problems, emotional distress, and academic performance. Their findings revealed significant and

positive effects for students in SEL programs relative to controls for all six outcomes.

To provide the “practical value” for academic achievement gains for students in the SEL intervention group versus students in the control group, Durlak et al. (2011) next calculated Cohen’s  $U_3$  “improvement” index to translate the mean effect size on measures of achievement to a score that reflects the average percentile rank for the average student of the intervention compared to the average student in the control group (who, by definition, would be at the 50th percentile; Institute of Education Sciences, 2008). Their analysis revealed that an effect size of 0.27 translated into an 11 % percentile difference. Put another way, the average student in the control group would demonstrate an 11 percentile increase in academic achievement if he/she had received an SEL program. Taken together, these results provide strong empirical evidence for the “value-added” of SEL programs in fostering students’ social and emotional skills, attitudes, and behaviors, and also counter the claim that taking time to promote students’ SEL would be detrimental to academic achievement.

Do students maintain their SEL competencies after the SEL program has ended? Findings from Durlak et al.’s (2011) meta-analysis provide additional support for the durability of effects of SEL programming on students’ social and emotional competencies. Among the smaller group of 33 interventions that included follow-up data (with an average follow-up period of 92 weeks), the positive effects at the time of follow-up remained statistically significant, although the effect sizes were smaller. Thus, Durlak and his colleagues provide some empirical evidence about the sturdiness of the effects of SEL interventions longitudinally.

Researches by Hawkins, Kosterman, Catalano, Hill, and Abbott (2008) exemplify the potential long-term positive effects of multiyear SEL programming on student outcomes. Specifically, Hawkins et al. (2008) found significantly reduced diagnosable mental health disorders (e.g., major depression, generalized anxiety disorder) at age 24 and age 27, 12, and 15 years after their SEL intervention had ended. Their results

also showed intervention effects indicating better educational and economic achievement among those individuals who received the SEL intervention in contrast to those who did not. Although more research is clearly needed, Hawkins et al.’s research provides important evidence about the potential long-term benefits of SEL interventions.

Most recently, Sklad and colleagues (2012) conducted a meta-analysis of 75 recently published studies of SEL programs and found results that mirror those of Durlak et al. (2011). Sklad, Diekstra, De Ritter and Ben (2012) found that universal school-based SEL programs had significant positive effects in the desired direction on seven outcomes: social-emotional skills, prosocial behavior, positive self-image, academic achievement, antisocial behavior, mental health problems, and substance abuse. Similarly, as with the Durlak et al. findings, the most positive effects were found for social-emotional skills; Sklad et al. (2012) found an effect size of 0.70. In other words, students participating in SEL programs, in contrast to controls, had social-emotional skills seven standard deviations higher, indicating that the average SEL program student had better social-emotional skills than 76 % of non-SEL students. Moderate effect sizes – those in which program effects were nearly a half of a standard deviation – emerged for four of the outcomes: academic achievement, positive self-image, prosocial behavior, and antisocial behavior. As for follow-up effects, the largest effects were found for academic achievement followed by substance abuse.

### Strategies for Promoting SEL

Classrooms and schools operate as systems and decades of research suggest that the unique culture and climate of classrooms and schools effects how and what students learn (e.g., Thapa, Cohen, Guffey, & Higgins-D’Alessandro, 2013). Whereas school culture refers to a general set of norms, beliefs, and practices or “the way things are done around here” (Hemmelgarn, Glisson, & James, 2006), school climate “is based on patterns of people’s experiences of school life and reflects

norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures” (National School Climate Council, 2007, p. 4). Culture and climate in combination influence the interactions and relationships among administrators, teachers, school staff, and students and of their approaches to teaching and learning (Gottfredson, Gottfredson, Payne, & Gottfredson, 2005). Therefore, any approach to promoting SEL needs to take into account both school culture and climate and systematically and intentionally embed SEL into the fabric of a school.

SEL interventions and skill development should occur within supportive classroom and school environments, as well as help to create such a climate. Additionally, successful SEL-related school and classroom activities foster active student voice in decision making, problem solving, and engagement for lifelong learning. Research also has shown that effective programs provide repeated opportunities to practice new skills and behaviors within the program structure and beyond to real-life situations. That is, providing opportunities to practice within classroom lessons is important, but actual opportunities to practice in real-life situations are likely to have even more impact (Durlak et al., 2011; Nation et al., 2003; Weare & Nind, 2011).

In their meta-analyses, Durlak and colleagues (2010, 2011) provided solid evidence that SEL programs promote better student outcomes when program implementers follow “SAFE” procedures: They use a *S*equenced step-by-step training approach; they emphasize *A*ctive forms of learning that require students to practice new skills; they *F*ocus specific time and attention on skill development; and they are *E*xplicit in defining the social and emotional skills they are attempting to promote. Durlak et al. (2011) also found that classroom teachers and other school personnel effectively implemented SEL programs – a finding that suggests that SEL programs can be incorporated into routine school practices and do not require staff from outside the school to successfully deliver an SEL program.

## What Works in SEL Programming?

A large corpus of SEL programs have been developed in recent years and there is considerable diversity among programs in terms of the scope of SEL skills addressed, intervention design, content of the curriculum, target audience (e.g., elementary vs. high school, teacher), and research evidence supporting the program’s effectiveness. Whereas some SEL programs include lessons that focus on the explicit instruction of students’ SEL competencies, others integrate SEL content into core academic subject areas, such as Language Arts or Social Studies. There also exist SEL programs and approaches that target teacher instructional practices and pedagogy to create and promote safe, caring, engaging, and participatory learning environments that foster student attachment to school, motivation to learn, and school success (Zins et al., 2004). Research has shown that the most beneficial school-based prevention and promotion programs are based on sound theory and research, and provide sequential and developmentally appropriate instruction in SEL skills (Bond & Hauf, 2004). They are implemented in a coordinated manner, school-wide, from preschool through high school. Lessons are reinforced in the classroom, during out-of-school activities, and at home. In effective SEL programs, educators receive ongoing professional development in SEL, and families and schools work together to promote children’s social, emotional, and academic success (Nation et al., 2003). In short, SEL can be seen as a template for effective school reform.

In 2003, CASEL created a program review of 80 SEL programs for kindergarten through 12 grade entitled *Safe and Sound: An Educational Leader’s Guide to Evidence-Based Social and Emotional Learning (SEL) Programs*. This groundbreaking review provided educators with practical information on the features of different programs that could help them select a program most relevant and suited for their particular needs. Although extensive, the program review included many programs for which there was little or no empirical evidence regarding their effectiveness. To address this limitation, in 2013,

CASEL reviewed more than 200 SEL preschool and elementary school programs and identified 23 programs that met high standards for program design, implementation supports, evidence of effectiveness, and applicability to specific grades. To be included in the *2013 CASEL Guide* (CASEL, 2013) and be designated as SElect, the program had to meet the following three criteria: (a) be a well-designed classroom-based program that systematically promotes students' social and emotional competence, provides opportunities for practice, and offers multiyear programming, (b) delivers high-quality training and other implementation supports, including initial training and ongoing support to ensure sound implementation and, (c) be evidence-based with at least one carefully conducted evaluation that documents positive impacts on student behavior and/or academic performance. The *2013 CASEL Guide* summarizes objective information about the characteristics of these nationally available, multiyear programs via a "consumer report" format that is clear and easy to read. Included in the Guide is information on 23 programs identified as CASEL SElect programs. Of the 23, 4 programs target preschool-age children, 16 target children in elementary school (K-5), and 3 serve both preschool and elementary aged children. A similar guide for middle school and high school programs will be published by CASEL in late 2013. In the following section, we briefly summarize *two* of the programs in the 2013 CASEL Guide for which there were at least three or more successful experimental-control group trials supporting their effectiveness. Each program is discussed, in turn, in the following section.

***The Caring School Community*** (CSC) program was developed by researchers at the Developmental Studies Center ([www.devstu.org](http://www.devstu.org)), a nonprofit organization with a focus on developing and disseminating programs that promote children's social, emotional, and academic development. The program targets children in Kindergarten to sixth grade and teaches teachers to employ participatory instructional practices such as cooperative learning groups, mastery teaching, and experiential

activities that promote relevant, interactive classroom learning. The program consists of four program elements: (a) class meeting lessons to promote dialogue among students, (b) a cross-age "buddies" program that pairs students across grades to build relationships and trust, (c) "home-side" activities that promote family involvement and inform parents of school activities while providing them with opportunities to participate, and (d) school-wide community building activities that involve school, home, and community. The CSC is unique in that it involves both extensive classroom-wide and school-wide efforts to create a sense of common purpose and commitment to prosocial norms and values such as caring, justice, responsibility, and learning, elements necessary for a "caring community" of learners.

Research conducted over the past two decades evaluating the effectiveness of CSC has shown that students who have participated in the program demonstrate more prosocial and less aggressive behaviors, and a range of positive school and motivation outcomes compared to children who have not received it (Battistich, Schaps, Solomon, & Watson, 1991; Battistich, Schaps, Watson, & Solomon, 1996; Battistich, Solomon, Watson, & Schaps, 1997; Battistich, Solomon, Watson, Solomon, & Schaps, 1989; Battistich, Schaps, & Wilson, 2004). In the schools in which CSC has been implemented, increases in students' sense of the school as a caring community have been reflected in a positive orientation toward school and learning, mutual trust in and respect for teachers, and overall increases in prosocial behavior and social skills. These positive effects remained stable in high-poverty schools with the highest sense of community, suggesting the effectiveness of this program for high-risk settings (Battistich et al., 1997). A follow-up study evaluated program effects on 525 students after they reached middle school. Findings at follow-up included higher grade point averages and achievement test scores, greater involvement in positive youth activities, and less frequent problem behavior at school and acts of violence (Battistich et al., 2004).



**The PATHS<sup>®</sup> (Promoting Alternative Thinking Strategies) curriculum** is a comprehensive program for promoting emotional and social competencies and reducing aggression and behavior problems in preschool and elementary school children. The PATHS curriculum was designed to be used by educators and counselors in a multiyear, universal prevention model. The PATHS curriculum, taught three times per week for a minimum of 20- to 30-min per day, provides teachers with systematic, developmentally based lessons, materials, and instructions for teaching their students emotional literacy, self-control, social competence, positive peer relations, and interpersonal problem-solving skills. Students have many opportunities to practice identifying a wide range of feelings and their associated bodily sensations, calming themselves through breathing techniques, and taking others' perspectives while solving interpersonal problems.

PATHS<sup>®</sup> has been field-tested and researched with children in regular education classroom settings, as well as with a variety of special needs students (deaf, hearing-impaired, learning disabled, emotionally disturbed, mildly mentally delayed, and gifted). The PATHS program has robust evidence from well-designed and methodological rigorous studies showing its effectiveness in reducing children's aggression and hyperactive-disruptive behavior and in increasing their positive and prosocial behaviors (e.g., Conduct Problems Prevention Research Group, 1999, 2010; Domitrovich, Cortes, & Greenberg, 2007; Greenberg, Kusche, Cook, & Quamma, 1995). Specific positive outcomes found across a range of studies inclusive of a range of populations have included better understanding of emotional and social situations, greater toleration of frustration, improved problem solving and conflict resolution, and decreased sadness and disruptive behaviors.

### **What Is Promising in SEL Programming?**

The 2013 CASEL Guide provides descriptions of several other SEL programs that have empirical

evidence supporting their effectiveness; however, they did not meet the criteria of three experimental trials. The programs for Preschool include: Al's Pals, HighScope Educational Approach for Preschoolers, I Can Problem Solve, The Incredible Years Series, Peaceworks: Peacemaking Skills for Little Kids, and Tools of the Mind. The programs for Elementary School include: 4 Rs (Reading, Writing, Respect, and Resolution), Competent Kids Caring Communities, I Can Problem Solve, The Incredible Years Series, Michigan Model for Health, MindUp, Open Circle, Positive Action, Second Step, Raising Healthy Children, Resolving Conflict Creatively Program, Social Decision Making/Problem Solving Program, Second Step, Steps to Respect, Responsive Classroom, RULER Approach, Too Good for Violence, and Tribes Learning Community. Rather than focus on these promising programs, this section briefly describes some of the emerging work aimed at the systematic implementation of SEL programming at the school district level.

The new generation of promising approaches in SEL includes systemic approaches specifically targeted at the school or district levels. Indeed, school districts need to make the promotion of SEL an important part of education that is equal to efforts to promote students' academic achievement, high school completion, and college- and career-readiness (Dymnicki, Sambolt, & Kidron, 2013). Researchers and educators at CASEL have heeded this call, and in 2011, they initiated a groundbreaking project to systematically infuse SEL into the core of education. Titled as the "Collaborating Districts Initiative" or CDI, CASEL is partnering with eight large urban districts in the USA (Anchorage, Austin, Chicago, Cleveland, Nashville, Oakland, Sacramento, and Washoe County, Nevada) to encourage systemic changes that will influence students' social-emotional development and academic performance.

CASEL's CDI theory of action highlights ten district practices for systemic SEL implementation that will lead to beneficial school-wide and classroom programming and services for all students (see <http://casel.org/collaborating-districts-initiative/>): (a) conduct SEL-related resource



and needs assessment across the district and individual schools, (b) develop a district-wide vision that prioritizes academic, social, and emotional learning, (c) develop central-office and school leadership expertise in SEL theory, research, and practice, (d) communicate about SEL with all district stakeholders, (e) align resources to support SEL programming, (f) design and implement effective professional development programs to foster the quality planning, implementation, and sustainability of coordinated SEL programming, (g) establish preschool through high school learning standards for students' social and emotional competence, (h) adopt and implement evidence-based SEL programs in all schools across all grades levels, (i) integrate SEL programming with other academic and student-support initiatives and priorities, and (j) establish systems to continuously improve SEL programming through monitoring implementation and assessing student outcomes.

The CDI aspires to develop districts' capacities to plan, implement, and sustain systemic changes that support school-wide and classroom efforts to enhance students' social-emotional development and academic performance. Throughout this multiyear project, CASEL and the districts are working with a third-party evaluator, the American Institutes for Research, to document essential strategies and processes that work to successfully bring evidence-based SEL to all students. Their findings will be used to inform future efforts to foster high-quality implementation in school districts across the country.

### What Does Not Work in SEL?

The effective *implementation* of an SEL program plays a crucial role in influencing student outcomes. Unfortunately, some well-designed SEL programs do not promote positive student outcomes, often due to variability in way the program is implemented in the "real world" setting of a school and/or classroom. To determine the influence of implementation or "what a program consists of when it is delivered in a particular setting" (p. 329) on program outcomes, Durlak

and DuPre (2008) conducted an extensive review of over 500 quantitative studies. Their analysis revealed several contextual factors that influence program implementation, including: Community Level Factors (e.g., prevention theory, funding, policy), Provider Characteristics (e.g., perceived need for the intervention, perceived benefits of the intervention), Characteristics of the Innovation (e.g., compatibility or "fit"), Factors Relevant to the Prevention Delivery System (i.e., organizational capacity), and Factors Related to the Prevention Support System (i.e., training, technical assistance).

Durlak and DuPre (2008) highlighted two findings that emerged as particularly noteworthy. First, positive outcomes were obtained with implementation levels around 60 %, few studies achieved implementation levels over 80 %, and not one of the studies achieved an implementation level of 100 %. They concluded that program developers and researchers therefore do not need to expect perfect or near-perfect program implementation to achieve successful outcomes. Second, their analysis revealed considerable variability in levels of implementation among program providers. Program implementation data were found to range as much as 87 %, with differences as much as 20–40 % commonly found among program providers in the same study. This indicates that even if researchers report the average level of implementation in their study, they can obfuscate the fact that some program providers are better in implementing programs than others.

A recent study by Reyes, Brackett, Rivers, Elbertson, and Salovey (2012) serves as an illustration of the critical role of the program provider in determining an SEL program's effectiveness. They examined whether the amount of training teachers received, the quality of delivery of the SEL program, and the amount of lessons students received (dosage) were associated with student outcomes of social and emotional competence during the initial implementation phase (i.e., the first year of adoption) of a theoretically derived SEL program – the RULER Approach. Participants included 812 sixth grade students and their teachers from 28 elementary schools in a large

urban school district in the northeastern USA that were part of a large randomized controlled trial (RCT). Statistical analysis clustered teachers into one of three groups: *low quality implementers* (i.e., teachers initially very resistant to the program and delivered it poorly but became open to the program by the end of the school year), *moderate-quality implementers* (i.e., teachers who were moderate in their attitudes toward the program and in their delivery of the program from beginning to end), and *high-quality implementers* (i.e., teachers who were consistently open to and delivered the program very well from beginning to end). Analysis revealed no overall main effects for training, implementation quality, or dosage. There were, however, more positive outcomes for students when their teachers attended more trainings and implemented more lessons, and were classified as either “moderate” or “high” implementers. Further analyses revealed that teachers categorized as “low implementers” were lower in their sense of teaching efficacy (i.e., beliefs about their capabilities to modify their teaching practices to influence students’ engagement and learning even among difficult and unmotivated students) than teachers categorized as “high implementers.” These findings underline the importance of not only considering training and program fidelity when examining effective SEL program implementation, it is also critical to take into account teachers’ beliefs and attitudes about an SEL program and their teaching efficacy when assessing the influence of implementation on students’ outcomes.

## Summary

Recent research indicates that the myopic focus on academics as the sole purpose of education appears to be shifting, at least among teachers and the general public. Particularly noteworthy is a recently published report of a nationally representative survey by Civic Enterprises and Peter D. Hart Research Associates of more than 600 teachers (Bridgeland, Bruce, & Hariharan, 2013). Their report showed that most preschool to high school teachers believe that social and

emotional skills are teachable (95 %) and that promoting SEL will benefit students from both rich and poor backgrounds (97 %), and will have positive effects on their school attendance and graduation (80 %), standardized test scores and overall academic performance (77 %), college preparation (78 %), workforce readiness (87 %), and citizenship (87 %). Additionally, these same teachers reported that in order to effectively implement and promote SEL in their classrooms and schools, they need strong support from district and school leaders. These findings are important, because they demonstrate that although there is a readiness among teachers to promote SEL, there is a need for a systemic approach that supports implementation at the district level.

The results from the latest 2013 PDK/Gallup Poll of the Public’s Attitudes Toward the Public Schools indicate that sentiments of general public echo those espoused by teachers (Bushaw & Lopez, 2013). The report found that most Americans agree that public schools should teach students a full range of social, emotional, and cognitive competencies including how to set meaningful goals (89 %), communication skills (94 %), how to collaborate on projects (84 %), and character (76 %).

Yet, despite the strong consensus that exists among educators and the public regarding the enormous potential of SEL as a fundamental component of school reform, to make SEL a national priority, it is essential that policy makers in Congress and the federal education department take action. One way to do this would be to have them modify the Elementary and Secondary Education Act to include language that gives specific attention to SEL, and include specific support for it in early learning and in federal assistance to schools in high-poverty communities. Some of this work to include SEL into Federal Legislation is already underway. Bipartisan groups of legislators have demonstrated their interest in SEL by repeatedly introducing the Academic, Social, and Emotional Learning Act in the U.S. House of Representatives. The latest bill – The Academic Social and Emotional Learning Act (H.R. 1875) – was

introduced on May 8, 2013, in the 113th Congress by Representative Tim Ryan (D-Ohio). This bill defines SEL and SEL programming, delineates the core areas of social and emotional competency, and amends the Elementary and Secondary School Act to allow funding for teacher and administrator professional development and training in SEL programming. For the bill to become law, however, it is crucial that elected officials listen to public opinion regarding the central role of SEL in promoting students' school and life success, and that all schools in the nation need to intentionally address SEL so that all students can succeed in a complex, globalized society (Weissberg & Cascarino, 2013).

Many educators, however, have not been adequately prepared to apply and understand the effective implementation of SEL programs and practices. Given recent breakthroughs in the science of SEL, it is critical now more than ever that teacher preparation programs include both the science and practice of SEL into coursework and pre-service field experiences in schools. To date, we have limited knowledge of the degree to which this is occurring. Schonert-Reichl and colleagues (*in press*) are currently conducting a scan to determine the extent to which US state's require any coursework or knowledge for teacher certification and whether Colleges of Education in the USA and Canada include any course content on SEL in teacher preparation programs. Their report will inform educators, policy makers, and practitioners about strategies and tools to increase the effective and broad implementation of research-based, coordinated practices to promote SEL into teacher preparation.

Recent evidence indicates that efforts to improve teachers' knowledge about SEL alone are not sufficient for successful SEL implementation. Indeed, teachers' own SEL competence and well-being appears to play a crucial role in influencing the infusion of SEL into classrooms and schools (Jones, Bouffard, & Weissbourd, 2013). Jennings and Greenberg (2009) reviewed literature linking teachers' SEL competence and student outcomes and convincingly argued that teacher social-emotional competence is an important contributor to the nature of

a teacher's relationships with students and "that the quality of teacher-student relationships, student and classroom management, and effective social and emotional learning (SEL) program implementation all mediate classroom and student outcomes (p. 492)." They recommend the development and implementation of interventions designed to specifically address teachers' SEL competence that focus on reducing teacher's stress and burnout and improving teacher's well-being.

Although limited, the past few years have seen the emergence of interventions specifically targeted at improving teachers' SEL and stress management. For example, two programs designed to promote teachers' SEL competence by incorporating mindfulness-based approaches are CARE (Cultivating Awareness and Resilience in Education) and SMART-in-Education (Stress Management and Resiliency Training). Mindfulness is typically described as an attentive, nonjudgmental, and receptive awareness of present moment experience in terms of feelings, images, thoughts, and sensations/perceptions (e.g., Kabat-Zinn, 1990). Both programs aim to increase teacher's "mindfulness, job satisfaction, compassion and empathy for students, efficacy for regulating emotions, and decrease in stress and burnout." Initial research to date has supported the effectiveness of both the CARE (Jennings, Frank, Snowberg, Coccia, & Greenberg, 2013; Jennings, Snowberg, Coccia, & Greenberg, 2011) and SMART-in-Education (e.g., Benn, Akiva, Arel, & Roeser, 2012; Roeser et al., 2013) programs in promoting teacher's SEL competence and well-being. Nonetheless, further research is needed to examine whether such positive changes in teacher's well-being spill over into the classroom and lead to improvements in students' SEL competence.

Although much has been learned in the past decade about SEL programs and their effects on children's social and emotional competence and academic success, the field has further to go before firm conclusions can be made about the specific ways in which an SEL approach advances children's short-term and long-term school and life success. Indeed, many questions

still remain regarding the ways in which programs and practices designed to promote children's SEL skills can forecast children's future success. For example, what are the processes and mechanisms that lead to successful improvements in children's social and emotional competence across programs? Which programs work best for which children? And under what conditions is optimal development fostered? These are the types of questions that are being asked among both educators and researchers, and are the types of questions asked by those who share a focus on determining the factors underlying the development of children's social and emotional competence and school and life success.

There exists a clear need for greater efforts to translate science for practice and policy so that SEL approaches can be better integrated into schools and communities. Such efforts can help to build the processes and structures needed to foster high-quality implementation and promote sustainability of programs (Elias, Zins, Graczyk, & Weissberg, 2003). Also necessary is a greater degree of collaboration between researchers and educators to learn from one another. In today's complex society, we need to take special care to encourage and facilitate our young people to reach their greatest potential and to flourish and thrive. It is therefore critical that we make intentional efforts to devise the most effective preventions and educational practices that promote SEL in all children. Such efforts must be based on strong conceptual models and sound research. Then will we be in a better position to advance the development of all children and youth.

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## Substance: Misuse During Childhood

Frank J. Snyder

Department of Health and Kinesiology,  
College of Health and Human Sciences, Purdue  
University, West Lafayette, IN, USA

### Introduction

Research increasingly shows that childhood substance use is a substantial public health concern (Donovan, 2007; Hibell et al., 2012; Johnston, O'Malley, Bachman, & Schulenberg, 2012). Early initiation of substance use in childhood is associated with substance use problems later during the life course (Clark, Cornelius, Kirisci, & Tarter, 2005; Fergusson, Lynskey, & Horwood, 1994). Many risks are related across the life course, and having one risk during childhood increases the likelihood that another will develop (Catalano et al., 2012). Thus, these issues indicate a need for early substance use intervention and prevention approaches. The majority of research and prevention efforts, however, target middle-school and high-school students, simply because a larger proportion of adolescents are likely to engage in substance-using behaviors compared to younger children. Focusing so much attention on adolescents may be disadvantageous, because the problem likely takes root much earlier during childhood development and even before birth (Zucker, Donovan, Masten, Mattson, & Moss, 2008). In the ensuing entry, an update to a prior version written by Partridge and Flay (2003) is provided. We describe recent epidemiological data and several theories for developing and evaluating programs designed to prevent childhood substance use. Additionally, we provide a literature review to highlight prevention strategies that have succeeded and some important research needs.

### Definitions

*Biosocial heterochrony* refers to differences in the rate of timing of both biological and social

events in the course of development. *Precocious puberty* is the onset of puberty that is earlier than the population average. For girls this tends to be around 9–10 years of age and for boys 11–12 years of age.

### Scope

*US Population.* Relative to the large amount of research on adolescents, there is little research and epidemiological data on childhood substance use in the United States. Some estimates are available, however, regarding the extent of childhood substance use. By and large, childhood substance use is restricted to alcohol, tobacco, inhalants, and marijuana. Alcohol and tobacco are the most widely used substances in this age group. The Monitoring the Future Survey (Johnston et al., 2012), an ongoing study of adolescents since 1975, reported 2011 data from a survey of eighth graders that asked about substance use as far back as the fourth grade. According to these most recent results, nearly 5 % of eighth graders reported using alcohol during fourth grade or earlier; nearly 16 % reported use by the sixth grade. Because these data are available over the last two decades, trends can be observed across time. During the last two decades, there has been a gradual decline for lifetime prevalence of alcohol use, although the decline is less pronounced in earlier grades, particularly in grades four and five. A similar trend is also true about self-reported drunkenness.

Results for 2011 self-reported tobacco use followed a similar pattern; over 3 % of 2011 eighth graders reported using cigarettes during fourth grade or earlier, with over one in ten students reporting use by the sixth grade. Again, during the last two decades, there has been a decline in cigarette use – a decline more dramatic than alcohol use – although this decline has occurred most prominently among seventh- and eighth-grade students. The percent of eighth-grade students who reported using cigarettes in the fourth and fifth grades has been relatively stable around 3–5 % during the last two decades. During 2011, relative to alcohol and tobacco,

fewer eighth graders reported the use of inhalants (nearly 3 %) and marijuana (1 %) in the fourth grade or earlier. These rates increased, however, to over 7 % using inhalants and over 5 % using marijuana by the sixth grade. The trends in inhalant and marijuana use have varied over the last few decades, particularly among grade six students and above.

Overall, alcohol and tobacco use can begin at an early age, with inhalant and marijuana use occurring later. Trends in the Monitoring the Future data across time have indicated an overall reduction in the lifetime prevalence of early substance use, and fewer eighth graders are reporting first use at earlier grades. Substance use is more common as students approach seventh and eighth grades. Some students, however, use substances at a very young age (Faden, 2006), with alcohol use being a substantial concern at earlier grades (Donovan, 2007). These findings are important because children who use substances for the first time at an earlier age may be more likely to become long-term users and exhibit other risk behaviors (Clark et al., 2005; Donovan & Molina, 2011; Fergusson et al., 1994).

*International Populations.* Relative to the United States, even less research is available on childhood substance use from other countries. There is, however, some information that can be gleaned from data collected as part of the Health Behavior in School-Aged Children survey (HBSC; Settertobulte, Jensen & Hurrelmann, 2001) and the European School Survey Project on Alcohol and Other Drugs (ESPAD; Hibell et al., 2012). The HBSC survey began in the 1980s and is a cross-national survey of 11-, 13-, and 15-year-old students that now includes 43 countries throughout Europe and North America. One detailed HBSC report (Settertobulte et al., 2001) focuses specifically on alcohol use among young Europeans. Results from the HBSC survey show that most youth first use alcohol at age 15 or before. Among 11-year-olds, more than 50 % reported using alcohol at least once. Generally, nearly all countries participating in the HBSC survey show that the initiation of alcohol use takes place early in life. Another recent HBSC report (Currie et al., 2012) demonstrated

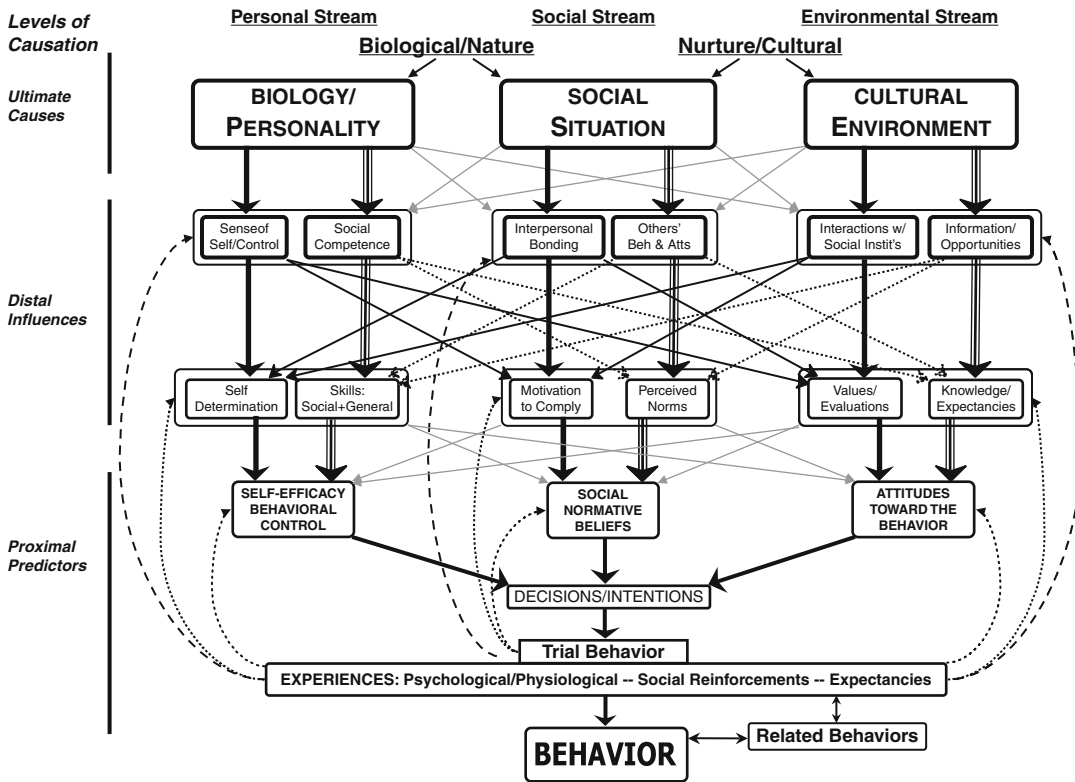
similar results and indicated that alcohol use among 11-year-olds was typically more common for boys than girls. A similar gender effect typically occurred for tobacco initiation across countries. Research has also shown that locations spanning the globe have a rather uniform age of initiation of substance use, but lifetime prevalence rates have differed across these sites (Vega et al., 2002).

Similar data are available from the ESPAD project, initiated in 1995 to survey European students aged 15–16 years (World Health Organization, 2011). The survey also includes data on the self-reported age of initiation for students aged 13 or younger (Hibell et al., 2012). Results show that in three-quarters of countries, the majority of students used alcohol by age 13, with the highest proportions found in Latvia (79 %), Estonia (76 %), Bulgaria (73 %), Slovenia (71 %), and the Czech Republic (70 %). With regard to cigarette use, 31 % of students had smoked by the age of 13 or younger, with 7 % of students reporting smoking cigarettes on a daily basis. Fewer younger students reported using other substances such as inhalants and marijuana, with averages around 4 % and 3 %, respectively.

Thus, in the United States and internationally, alcohol and tobacco are used most commonly among younger students. Compared to alcohol, cigarette use is generally less common, followed by the use of inhalants and marijuana. Notably, similar to the United States, there is a relative lack of international research on substance use in populations aged 12 and younger.

## Theories

Traditionally, substance use prevention programs have used concepts based on either *social learning theory* or *health beliefs models* (Orlandi, 1996). Social learning theory (Bandura, 1977) recognizes the influence of role models (e.g., parents, peers, siblings, teachers, athletes, celebrities) with whom a child identifies. Expectancy-value models (e.g., the Theory of Reasoned Action; Fishbein & Ajzen, 1975) suggest that adolescent substance use is influenced by



**Substance: Misuse During Childhood, Fig. 1** The theory of triadic influence (Adapted from Flay et al. 2009)

perceived normative attitudes toward substance use and expectations about the consequences of substance use involvement. These two theoretical perspectives are not mutually exclusive, however, and are likely complementary, such that more recent prevention-oriented theoretical frameworks have synthesized them. Indeed, the growing trend in prevention theory is a move toward integration of microtheories (Orlandi, 1996). Although social learning theory and health beliefs models form the core of these integrated theoretical perspectives, the most promising theories are also incorporating theoretical notions related to biological and personality factors, emotional and cognitive factors, interpersonal and social skills, and contexts such as families, school environments, and community organization.

The *theory of triadic influence* (TTI) is one integrative model of health behavior based on both ecological and expectancy-value

frameworks (Flay & Petraitis, 1994; Flay, Snyder & Petraitis, 2009). This model is useful for etiology research and in developing and evaluating programs. The TTI includes two primary dimensions that are aligned to form a detailed outline of human behavior. One dimension – from left to right in Fig. 1 – refers to three streams of influence on behavior: biology/personality influences, social situation influences, and cultural/environmental influences. These influences correspond to Urie Bronfenbrenner’s well-known bioecological model (Bronfenbrenner & Morris, 2006). The second dimension – from top to bottom in Fig. 1 – refers to levels of causation within each of the three streams of influence. Thus, causes can be thought of as flowing down each stream through the levels of causation. That is, each stream of influence flows from more upstream, ultimate causes of behavior (e.g., genetics, parental warmth, neighborhood

violence, and sociocultural influences like religion, politics, mass media) that influence a wide array of health outcomes to more downstream, proximal predictors (e.g., intentions to drink alcohol or smoke tobacco) that are more behavior specific and thought to directly influence childhood substance use. Further, the interdependencies among the three streams of influence are captured in cross-stream influences. For example, biology/personality influences the social situation and vice versa. Finally, the TTI allows for iterative influences whereby experiences such as initial experimentation with tobacco, alcohol, or other substances provide feedback – shown as dotted lines in Fig. 1 – that can change the state of more upstream variables in each of the three streams of influence. Thus, the TTI is more explicit than most other ecological frameworks, given that it includes detailed hypotheses about causal pathways (i.e., mediation and moderation). Overall, the TTI is a theoretical framework that addresses not only substance use but also broader health behavior, including healthy outcomes (e.g., academic achievement) that relate to positive youth development (Snyder & Flay, 2012). The TTI also applies across the life course to a broad age range, including younger children, adolescents, and adults. In addressing substance use among children, however, at least two special considerations need to be made more explicit.

First, individual differences in rates of biological and social development (biosocial heterochrony) play an important role in childhood substance use. Precocious puberty is likely a prominent type of heterochrony that influences substance use (Brooks-Gunn & Graber, 1994; Graber, Nichols, & Brooks-Gunn, 2010). Two traditional hypotheses attempt to explain the role of precocious puberty (Tschann et al., 1994). The early maturation hypothesis suggests that precocious puberty increases the risk of using substances through increased social pressure and exposure to substance use before the child has developed the social skills to deal with these situations. The maturation deviance hypothesis suggests that nonstandard timing of development increases social and emotional stress, thereby

increasing the likelihood of substance use as a coping mechanism. The effects of precocious puberty on substance use can also be interpreted from a developmental contextual framework whereby individual- and contextual-level factors influence the likelihood of substance use (Holmbeck & Shapera, 1999 as cited in Holmbeck, 2002). For example, precocious puberty may lead to early substance use only when family members react to early pubertal maturity in particular ways, such as strict, unsupportive parental rules. Indeed, pubertal status, personal characteristics, context, and learned alcohol experiences can all play a role in childhood alcohol use (Gunn & Smith, 2010).

Second, special consideration should be given to the distinction between prevention efforts that target children who begin to experiment with substances prior to adolescence and prevention efforts that target experimental and regular substance use in adolescence. Alcohol and tobacco use is often thought of as somewhat normative during adolescence, whereas use of these substances earlier in childhood is more indicative of familial and behavioral problems (Clark et al., 2005). Further, an important concept is that peer behavior is a key influence during adolescence, and it is less important during childhood (Bush, Weinfurt, & Iannotti, 1994). The majority of successful adolescent prevention programs incorporate social skills training designed to build peer communication skills, with particular emphasis on refusal skills. When directed at younger children, especially those in primary grades, such training needs to take into account the fact that children have less mature cognitive skills. Social skills of younger children tend to be more rote and less flexible, and the social rules that apply to them tend to be parochial.

Developmental timing issues are also important to theories that inform childhood substance use programs (Cicchetti, 2006). Multiple sources of influence and the timing of developmental processes predict that earlier use and/or regular use orients the child's developmental context toward a state that supports an escalation to long-term regular substance use and, in some

cases, illicit polydrug use, as well as a host of other negative behaviors. Conversely, the later the initiation of trial substance use, the more likely the larger developmental context may be oriented such that trial behavior will be experimental and of short duration, substantially reducing the risk of chronic use and subsequent addiction.

## Current Research

The current trend in substance use prevention theory toward integrative, ecological frameworks relates to earlier work in developmental systems theory (Ford & Lerner, 1992; Lerner, 2006). Developmental systems theories incorporate components that highlight the importance of both biological and environmental factors and the interactions between them (Lerner). At least one noteworthy point should be highlighted regarding the implications for developmental systems approaches to childhood substance use etiology: There are various etiological pathways due to the multiple domains of influence and the contextual nature of any given risk or protective factor (Cicchetti, 2006). Simply put, there are many interacting influences that cause human behavior. This suggests that empirical findings can be inconsistent across studies and at times contradictory, but nevertheless useful in different contexts. There are, however, findings that are consistent with regard to childhood factors that predict increased risk for early alcohol use. These factors include but are not limited to a family history of alcohol abuse, parents' antisocial behavior, prenatal exposure to alcohol, maltreatment, and children's challenges with regulating their attention and emotion (Masten, Faden, Zucker, & Spear, 2008). While many of these issues are beyond the scope of the current entry, we will address three issues that are of special consideration for childhood substance use.

First, the issue of precocious puberty is often under-addressed in prevention programs. There is evidence, however, that it plays an important role. For instance, Stattin and Magnusson (1990) report extensive findings indicating that

precocious pubescent girls are more likely than their normative pubescent peers to engage in a wide range of risk behaviors, prominent among them substance use. More recent research also reports this effect of early menarche on substance use (Posner, 2006) and indicates a need to better understand the experiences of adolescent females. Further, as theory suggests, there is evidence showing that the effects of precocious puberty on substance use are not purely biological in nature, but rather represent the convergence of multiple sources of influence, including biological and psychosocial events (Brooks-Gunn, & Graber, 1994; Mendle, Turkheimer, & Emery, 2007). For example, precocious pubescent girls may get caught in a complex cycle of mutually reinforcing influences that stabilizes early smoking behavior. The confluence of distorted body image, early weight gain associated with early pubescence, and the perceived weight reduction properties of cigarettes have been shown to lead to early initiation of smoking in preadolescent girls (Crisp, Sedgwick, Halek, Joughin, & Humphrey, 1999). Boys are a more difficult population in which to study maturation, but there is also evidence that early maturation among boys is related to internalizing and externalizing challenges (Graber et al., 2010).

The second area of special consideration for the prevention of childhood substance use is the role of the family versus peers as the predominant influence on substance use behavior. Research shows that both family and peers can play a role in substance use among elementary-aged children (Donovan et al., 2006). For instance, parental beliefs that allowing children to sip alcohol can have protective consequences are related to child-reported alcohol use (Jackson, Ennett, Dickinson, & Bowling, 2012). Other variables related to alcohol use in this group include conflict with parents, parents' approval of children drinking, and peers' approval of drinking and drug use (Donovan & Molina, 2011). Perceived family use has been shown to be a stronger influence relative to perceived peer use on substance use behaviors among fourth- and fifth-grade students. However, this relationship was reversed by the seventh grade (Bush et al., 1994). Furthermore, a deviant



peer group is a major predictor of adolescent substance use, but parent–child conflict, impaired quality of mother–child interactions, and several other parental factors have been shown to predict belonging to a deviant peer group (Arnett, 2007; Fergusson & Horwood, 1999).

Third, in addition to the identification of multiple etiologies derived from the adoption of developmental systems theoretical perspectives, the timing of initiation is critical (Cicchetti, 2006). As reported by Fergusson et al. (1994) in a New Zealand sample, exposure to alcohol before age 6 increased the likelihood of becoming a regular alcohol user during adolescence by 1.9 to 2.4 times. Further, in a US sample, recent research shows that sipping or tasting alcohol by the age of 10 nearly doubled the likelihood of alcohol use later in adolescence (Donovan & Molina, 2011).

## Overview of Strategies

Much as in the case of childhood substance use epidemiological data, there is a relative dearth of research on prevention programs for elementary-aged children. In contrast to mental health outcomes, too little research has been done on childhood substance use prevention and treatment to draw many empirically based conclusions (Chorpita et al., 2011). There has been, however, an escalation and improvement in research on childhood substance use prevention programs over the last decade. Some of these programs were adapted from programs originally designed for adolescents. Although there has been progress, there is often a need for replication and long-term follow-up research, and we encourage readers to examine whether programs meet criteria for effectiveness (see Flay et al., 2005). The term “evidence-based” is frequently used broadly to suggest that a program evinced some effectiveness without regard to the scientific rigor of the research.

Generally speaking, successful and promising programs include components that are developmentally focused, seek to enhance skills, are easily integrated into the curriculum, incorporate interactive approaches (e.g., modeling, role play,

practice), and involve a collaborative process between children, parents, teachers, school administrators, and communities (Webster-Stratton & Taylor, 2001). These program features are similar to those included in effective programs designed for middle-school and high-school students. This suggests that there are some general components that should be common among childhood and adolescent programs. First and foremost, as suggested by integrative theories, these programs should address multiple domains of influence – ranging from the biological to the immediate psychosocial context to the larger family, school, and community contexts (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004). Second, similar to adolescent prevention programs and social and emotional learning programs, curricula that use an interactive teaching format tend to be of more benefit (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Lecture alone does not tend to work. Moreover, Durlak and colleagues (2011) suggest a sequenced step-by-step training approach, including active forms of learning, a focus on social and personal skill development, and explicit learning goals (i.e., SAFE practices). Third, school-based programs must take into account teacher acceptance of the program and provide teacher training on implementation. Lastly, elementary school prevention programs must be incorporated into a systematic prevention regime that extends from middle school to high school and beyond (Snyder & Flay, 2012).

As suggested above, there are some special considerations regarding the elements of an elementary-aged prevention program. First, there should be greater emphasis on family relations and support and less emphasis on peer factors (Bush et al., 1994). However, this should gradually shift during the transition from primary grades to fourth and fifth grades. Second, a strong focus on children’s strengths tends to be advantageous (Webster-Stratton & Taylor, 2001). Third, social refusal skills may be less effective in younger children as a result of the time lag between learning the skill and the situations in which those skills are used (Herrmann & McWhirter, 1997; Wynn, Schulenberg, Maggs, & Zucker, 2000).

Again, this relative shift in focus should gradually transition during the fourth- and fifth-grade years. Refusal skills should be used in combination with other program components (Herrmann & McWhirter, 1997). Finally, more emphasis should be given to aiding children who have started to either experiment or regularly use substances in finding effective treatment resources. Given that childhood substance use is often indicative of one or more challenges (Clark et al., 2005), special efforts should be made to address the needs of these children.

Overall, the above considerations do not represent a fundamental deviation from what is known about effective prevention programs with adolescents, young adults, and adults – the most effective programs often address people’s needs and their context. Programs should take an integrative approach that includes family, school, and community settings. As presented herein, programs can fit into at least four categories: family systems-based programs, preschool programs, school-based programs, and integrative programs that may include a combination of family, school, and community features. The following review of programs is not meant to be exhaustive, but rather highlights general successes and challenges in efforts to prevent childhood substance use and to sustain program effects.

## Strategies That Work

### Family Systems-Based Programs

As noted above, research shows that parents are an important influence on children’s substance use. Therefore, programs that enhance parent–child relationships and functioning can be of considerable value. One such strategy that seeks to achieve this involves prenatal and early childhood home-visitation services. The most thoroughly investigated home-visitation program utilized nurses as home visitors (Olds et al., 1997, 1998). The program is designed to provide parent education and support as well as increase positive parent–child interactions. Results from a 15-year follow-up to a randomized control trial

of this program showed less child abuse and neglect among mothers participating in the intervention as compared to the control group (Olds et al., 1997). Also at long-term follow-up, children from unmarried, low-income mothers who enrolled in the intervention reported smoking fewer cigarettes and less alcohol use as compared to the control group (Olds et al., 1998). More recent research shows home-visitation services can significantly improve outcomes related to children’s mental health (Olds, Kitzman, et al., 2004; Olds, Robinson, et al., 2004).

Another family-based program, Guiding Good Choices (formerly Preparing for the Drug Free Years), is a training program for parents of children aged 8–14. The program includes components to increase parent–child bonding that is hypothesized to occur through children’s proactive involvement in the family, children’s participation skills, child–family interaction, and rewards and punishments from parents (Mason et al., 2007). This program has been shown to be effective at improving parent–child relations (Kosterman, Hawkins, Spoth, Haggerty, & Zhu, 1997). Research also showed program effects on reducing the increase of substance use (Mason, Kosterman, Hawkins, Haggerty, & Spoth, 2003; Mason et al., 2007; Park et al., 2000) among older children who began the program in grade six and were followed into adolescence. Overall, more research is needed on family-based approaches, although empirical evidence suggests such programs can play a key role in preventing substance use (Velleman, Templeton, & Copello, 2005).

### Preschool Programs

Two preschool programs, the Abecedarian program and the Perry Preschool program, are important prevention efforts involving preschool-aged children and their families. Both programs were evaluated using randomized designs and have shown impressive effects on a number of indicators including substance use outcomes. The Abecedarian program (Duncan, Ludwig, & Magnuson, 2007) was an intensive program,

providing year-round, full-time care for 5 years to a mostly African-American sample of mothers and children. The program began during children's first year of life and included several components: access to transportation; low child-to-teacher ratios (i.e., 3:1 for younger children); a curriculum that emphasized language development and cognitive skills, with educational games; health care; and social services. Results indicated that the program had long-term effects on participants' mental health and quality of life (Duncan et al., 2007), along with a reduction in substance use (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002). Overall, the economic value of the program's benefits has been shown to greatly exceed the costs.

The Perry Preschool intervention (Duncan et al., 2007) afforded one or 2 years of part-day educational services and home visits to African-American children aged three to four from low-income families. The program included several key components: highly educated teachers, with at least a bachelor's degree; low child-to-teacher ratio (i.e., 6:1); and active learning. Results demonstrated that children participating in the program had significant long-term improvements in a number of quality-of-life indicators, along with lower rates of substance use (Schweinhart & Weikart, 1993). Similar to the relatively intensive Abecedarian and Perry Preschool programs, appropriately designed school-based and integrative programs are more likely to be effective.

### School-Based Programs

The Good Behavior Game is a classroom behavior management program (Kellam et al., 2011). Early in the first-grade year, the program involves teachers displaying classroom rules of behavior and organizing groups of students that are rewarded for the group's collective good behavior. The aim of this program is to reduce disruptive and aggressive behavior. Researchers hypothesized that the Good Behavior Game could prevent substance use as well as related risk behaviors by targeting disruptive and aggressive behavior. In a test of this hypothesis, Kellam

and Anthony (1998) reported on an epidemiological randomized field trial involving over 2,000 first graders from Baltimore area schools. This study showed a significantly reduced risk of smoking by age 14 for children who participated in the Good Behavior Game versus controls. This effect was significantly stronger for boys than for girls, but this finding is consistent with gender differences in the etiological role of aggression in smoking. In another randomized trial (Storr, Ialongo, Kellam, & Anthony, 2002), elementary-aged students who participated in the program were less likely to have started smoking compared to control students. More recently, in a long-term follow-up when first-grade participants were aged 19–21, Kellam and colleagues (2008) found significant program effects. As young adults, male participants had significantly less substance abuse disorders and regular smoking.

Researchers at the American Health Foundation developed the Know Your Body program in the 1980s for students in grades ranging from kindergarten to the end of high school (Resnicow, Cross, & Wynder, 1993). This program takes a general health-oriented approach but emphasizes substance use knowledge and addresses variables such as self-esteem, social skills, coping skills, and explicit refusal skills. Walter, Hofman, Vaughan, and Wynder (1988; Walter, Vaugh, & Wynder, 1989; Walter & Wynder, 1989) evaluated the program using a randomized design involving 15 New York State elementary schools. The researchers found that intervention school students had significantly lower biomarkers of tobacco use compared to control students. Another randomized trial with African-American students from Washington D.C. found similar results (Bush, Zuckerman, Taggart et al., 1989; Bush, Zuckerman, Theiss et al., 1989).

Growing Healthy is a comprehensive health education curriculum developed by the National Center for Health Education that is designed for children in kindergarten through sixth grade (Connell, Turner, & Mason, 1985). The program involves nearly 50 sessions per year, with each year's lessons focusing on a single health topic.

Substance use education and social/refusal skills are incorporated into the overall curriculum design. There has been an independent evaluation involving a sample of about 30,000 students in grades 4–7 (Connell et al., 1985). Results demonstrated the program group had lower rates of smoking in ninth grade than controls. Further, program participants had higher scores on variables including general health information and attitudes regarding health risk behavior.

## Integrative Programs

Some programs include features that extend to other contexts and include a combination of family, school, and community components. For instance, the Fast Track PATHS (Promoting Alternative Thinking Strategies) program is an approach that draws on the strengths of traditional school-based programming and integrates universal and selective interventions (Conduct Problems Prevention Research Group, 2010). The core program involves a curriculum that includes features addressing self-control, emotional awareness, social skills, and problem solving. Results of a randomized trial involving nearly 3,300 students demonstrate that the program can improve aggression and prosocial behavior among boys (Conduct Problems Prevention Research Group). Previous research (Bierman et al., 2004) has shown that an earlier version of the Fast Track program resulted in less self-reported substance use among fourth- and fifth-grade students involved in the program as compared to control students.

Another integrative approach is the Positive Action program (Flay & Allred, 2010; Flay, Allred, & Ordway, 2001). The Positive Action program is a comprehensive, school-wide program shown to affect youth development (e.g., academic achievement; Snyder et al., 2010) and create whole-school contextual change (Snyder, Vuchinich, Acock, Washburn, & Flay, 2012) in order to reduce risk behaviors, such as substance use. The full program includes K–12 classroom curricula (consisting of almost daily 15–20-min lessons), a school-wide climate development

component, and family- and community-involvement components. The sequenced curricula include an interactive approach and cover six major units on topics related to self-concept, physical and intellectual actions, social/emotional actions for managing oneself responsibly, getting along with others, being honest with yourself and others, and continuous self-improvement. The first randomized trial of the program involved 20 schools in Hawaii and showed that elementary-aged students receiving the program evinced significantly less substance use compared to control students (Beets et al., 2009). As theory suggests, whereby a link exists between positive and negative behaviors, less substance use was related to positive academic behaviors (Snyder et al., 2013). Another randomized trial of Positive Action included 14 schools in Chicago and demonstrated that students receiving the program self-reported less substance use in grade five (Li et al., 2011) compared to control students, with program effects sustained through grade eight (Lewis et al., 2012). These program effects were mediated by students' change in social-emotional and character development. Overall, research has shown that the program's focus on children's assets and positive actions can lead to improvements in a variety of health domains, including substance use.

The Aban Aya Project was designed to improve several risk behaviors among urban students, including violence, substance use, school delinquency, and risky sexual practices (Flay, Graumlich, Segawa, Burns, & Holliday, 2004). The project was a randomized control trial of three programs (two experimental interventions and one "attention-placebo" control) that were implemented in grades 5–8 in 12 Chicago schools from 1994 to 1998. One of the experimental conditions was a social development curriculum – a classroom-based program that included lessons to teach skills related to decision making, problem solving, conflict resolution, and goal setting. The other experimental condition was a school and community intervention that included the social development curriculum and added parental support plus school

climate and community components. Results showed that both experimental interventions reduced the rate of increase in negative behaviors among boys, including substance use. As hypothesized, the school and community intervention demonstrated stronger effects (Flay et al., 2004).

The Seattle Social Development Project is another integrative program that includes family and school components designed to enhance students' social, emotional, and refusal skills, along with improved parent and teacher skills (Hawkins, Kosterman, Catalano, Hill, & Abbott, 2005). The project began in 1981 with first graders from eight Seattle public schools. After students reached grade five, the program was expanded to involve a total of 18 schools that were nonrandomly assigned to several conditions. Overall, results have demonstrated a positive impact of this integrative program on multiple health domains, including substance use (O'Donnell, Hawkins, Catalano, Abbott, & Day, 1995). Long-term follow-up studies have shown that the intervention did not improve substance use, but improved other important outcomes including crime, sexual activity, and school success among adolescents (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999) and similar outcomes into young adulthood (Hawkins et al., 2005; Hawkins, Kosterman, Catalano, Hill, & Abbott, 2008).

More recently, Hawkins, Catalano, and colleagues (2008) have evaluated Communities That Care (CTC) – a system to help guide communities in choosing, installing, and monitoring programs intended to improve youth outcomes. The Community Youth Development Study is a randomized trial of CTC involving 24 communities in the United States. Student self-reports of substance use from grade 5 to 10 showed that by the tenth grade students from CTC communities had significantly less alcohol and cigarette use compared to control students (Hawkins et al., 2011).

We note that some of the aforementioned programs do not focus specifically or solely on substance use, but rather emphasize changes in variables thought to influence substance use. This approach is also true for other programs such as

LifeSkills Training, a program discussed in the next section that was originally designed for and rigorously evaluated with adolescents. Approaches that do not focus on substance use may lend programs a greater potential for the prevention of childhood substance use and other related risk behaviors. This is because these developmentally appropriate programs can be implemented early in childhood where many problems likely take root (Zucker et al., 2008).

## **Strategies That Are Promising**

### **School-Based Program**

LifeSkills Training is one of the most researched prevention programs designed for adolescents. It has demonstrated effectiveness in preventing substance use and other risk behaviors among this population. The program emphasizes teaching personal and social skills, norms, and drug resistance skills. Relatively little evaluation research is available involving elementary-aged students. However, the program was revised to be developmentally appropriate and evaluated in one randomized trial involving over 1,000 students in grades 3–6 from 20 schools (Botvin, Griffin, Paul, & Macaulay, 2003). Results indicated that intervention students reported less smoking, but did not differ on self-reported drinking frequency compared to control students. We are unaware of any long-term follow-up research on the effects of LifeSkills Training among children.

### **Strategies That Do Not Work**

Here again we must mention a lack of research. Moreover, it is often and unfortunately the case that research is not published about strategies that do not work. Such information is useful in understanding what not to do. As noted above, lecture alone does not tend to work and relatively few prevention programs targeted at elementary school students have been evaluated. Among those that have, long-term effectiveness was mixed. While a few elementary school programs

have demonstrated short-term successes, by twelfth grade these effects may erode unless there have been follow-up programs (Resnicow & Botvin, 1993). As such, it appears that isolated, “single-shot” interventions are ineffective – much like math or science education for a single year in elementary school will unlikely result in high academic achievement in high school and beyond.

We would be remiss not to mention programs such as Drug and Alcohol Resistance Education (DARE), an ineffective, albeit well-intentioned program. DARE uses a school-based approach that attempts to develop resistance skills among students, and it is one of the more widespread substance use prevention programs in the United States. However, multiple studies have shown DARE to be ineffective at achieving even short-term reduction of substance use (e.g., Ennett, Tobler, Ringwalt, & Flewelling, 1994).

## Synthesis

Researchers, practitioners, and policies generally pay too little attention to substance use in pre-adolescents, and relatively little epidemiological data exists around the world. Because early adolescence is where the majority of substance use occurs, that developmental period has been the focus of both research and intervention. But there is a growing recognition that substance use prevention should occur as early as grades k–3 and that more can be done to assure that children develop in healthy, supportive contexts. This recognition derives from not only evidence that children are using substances earlier but also an empirical understanding of the importance of children’s context and putting children on a path that discourages long-term use of harmful substances.

The foremost theoretical underpinnings of current prevention thinking are drawn from integrative, ecological theories such as the TTI. Prevention thinking includes two key concepts: (1) Childhood substance use is multifaceted in nature and results from multiple etiological pathways, and (2) preventive intervention is highly

sensitive to developmental timing. As such, both individual factors (such as emotional/cognitive traits and personality/temperament profiles) and contextual factors (including caregivers, siblings, peers, community institutions, media, and national funding and policy mandates) play a vital role in the development of childhood substance use. Further, the importance of any single factor depends upon all the other factors listed above and the timing of a child’s experiences across development.

Substantial advances have been made over the last several decades in child development research and in our understanding that investing in early childhood can have major economic returns on investment (Shonkoff, 2010). Despite advances in developmental and prevention theory in more recent years, relatively few new techniques have been adopted to change behavior. Most preventive interventions are still targeted at early adolescents and largely administered at school. There are, however, several pioneering programs that recognize the multidimensional influences on substance use. These programs have begun to involve parents, schools, and communities and are showing results. A number of programs have been set up for younger children and target variables that are linked to later substance use behaviors. Noteworthy programs include those that focus on families by featuring home-visitation designs. Other programs of particular note are integrative programs that seek to involve families, change school environments, and include community components. Given current empirical findings and available prevention approaches, we believe that a viable childhood substance use program must, at a minimum, recognize local contextual influences such as peer and family influences. It should also address broader contextual influences, such as the school setting, community infrastructure, policies, and media influences. Thus, prevention approaches need to extend beyond classroom walls to the family and community to address circumstances that support or deter substance use.

There is a need for programs to develop with and follow youth from early childhood to adolescence. Single exposure programs are



often insufficient and ultimately ineffective, wasting valuable resources. Prevention programs should be sensitive to the fact that childhood substance use arises out of a complex set of interactions within a variety of contexts and among children who develop at different rates. Given this complexity and variability, programs need to be flexible or tailored in order to address the many different pathways through which children come to use substances. We emphasize that a need still exists for basic substance use research and intervention trials with early childhood cohorts. This includes more research involving understudied populations, longitudinal research, genetically informed research, economic analyses, and replication. Such efforts hold tremendous potential to advance our understanding of substance use etiology and intervention research that can improve health outcomes throughout the life course.

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## Violence by Children in Schools and the Community

Courtney Swisher Banks<sup>1</sup>, Emily M. Lund<sup>1</sup>,  
Ryne Pulido<sup>1</sup>, Jessica E. Vaughan-Jensen<sup>1</sup> and  
Jamilia J. Blake<sup>2</sup>

<sup>1</sup>Texas A&M University, College Station,  
TX, USA

<sup>2</sup>Department of Educational Psychology, Texas  
A&M University, College Station, TX, USA

### Introduction

Youth violence is a highly publicized issue and has received national attention within the last 15 years due to school shootings that questioned the safety of public schools. In 1998, the media coverage of the Columbine shootings and the school shootings in Jonesboro, Arkansas, gripped the country and brought school safety into national awareness (Muschert, 2009). In response to these events, public demand for greater school safety prompted the implementation of a number of school violence prevention programs in order to curtail youth violence. More recently, cases of suicides related to bullying have moved school districts and policymakers to develop anti-bullying laws (Smith, 2011). Youth homicides occurring at school, however, are less than 2 % of all youth homicides, and youth suicides occurring at school are less than 1 % of all youth suicides (Robers, Zhang, & Truman, 2010). It would appear that schools are indeed safe environments for children and adolescents.

On the other hand, aggression and violence occur in many forms, at different levels of severity, and with varying degrees of overtness in schools and the larger community. Additionally, any incidence of youth violence can disrupt the physical and psychological development of a child, negatively impact a child's academic achievement, and have far reaching societal ripple effects. Thus, research has focused on examining theories of human behavior, specific factors that relate to and promote different forms of

youth violence, and prevention programs that aim to reduce specific forms of youth violence.

### Definitions and Scope

#### Youth Violence

The Centers for Disease Control and Prevention (CDC) defines *violence* as a threatened or actual physical force or power initiated by an individual which results in physical or psychological injury or death. *Youth violence* can be defined as harmful behaviors that occur in early childhood and can continue into young adulthood that cause physical and/or emotional harm (Centers for Disease Control and Prevention [CDC], n.d.). Youth violence is different from accidental injury or death and can be either verbal (e.g., threats) or physical. Specific forms of youth violence are aggression, bullying, gang involvement, and violence with weapons.

**Aggression and Bullying.** Aggression is any volitional behavior that is intended to harm or injure another person. Aggression may take many forms, but is most commonly manifested in youth as physical (e.g., kicks, punches, and pushing), verbal (e.g., name calling), relational (e.g., verbal and nonverbal social exclusion or malicious gossip; Blake, Lease, Olejnik, & Turner, 2010), or cyber aggression (e.g., using technology to ostracize or destroy one's reputation; Wolak, Mitchell, & Finkelhor, 2007). Similarly, bullying is a form of aggression that is characterized by an intention to harm but differs from aggression in that it involves repeated aggressive acts of aggression and an imbalance of power between the bully or bullies and their victims (Merrell, Gueldner, Ross, & Isava, 2008). Rates of aggression, specifically physical aggression, have demonstrated declines in the past 15, whereas incidents of bullying appear to be stable. For example, acts of physical aggression declined from 42 % in 1993 to 31 % in 2009 for children aged 9–12. Yet, in 2009, 19.9 % of youths in grades 9–12 reported being bullied in the past year (CDC, 2010).

**Gangs and Violence with Weapons.** Gang involvement can be thought of as the extreme end of deviant peer involvement (Dishion,

Nelson, & Yasui, 2005). Gangs are defined as a group of individuals that have allegiance with each other and seek to increase their status within the community through involvement in criminal activities (Esbensen, Winfree, He, & Taylor, 2001). During the 2007–2008 school year, 20 % of public schools reported incidences of gang activities (Robers et al., 2010). According to the Youth Risk Behavior Survey (Robers et al.), between 1 % and 8 % of students in grades 9–12 reported being threatened or injured with a weapon on school property.

**Measurement.** The most common assessment method of youth and school violence is self-report surveys administered to students and staff to identify the frequency and severity of violent events. However, concerns surrounding privacy and confidentiality, response bias, and faulty memory retrieval of events can compromise the psychometric adequacy of self-report measures. Therefore, multiple informants (e.g., students and staff) in addition to alternate measures of youth and school violence such as school discipline records and criminal justice records are used to assess the incidence of youth violence in schools and community settings.

## Theories

Researchers and mental health professionals have attempted to determine the etiology of violence, aggression, delinquency, and antisocial behaviors, which include a wide range of behaviors that violate societal norms (Rutter, Giller, & Hagell, 1998). Whereas a number of theories have been proposed to explain the development of violence, some perspectives have received more empirical support in the literature than others, specifically genetic explanations for violence, developmental perspectives, social learning, and attachment theories.

Many researchers have theorized that violence is transmitted genetically. Aggressive behavior appears to be moderately heritable. For example, a meta-analysis of twin and adoption studies concluded that genes explain about 40 % of the variance in antisocial behavior, while

environmental factors explain the rest of the variance in antisocial behavior (Rhee & Waldman, 2002). If parents exhibit violent behavior, there is a chance they will transmit genetic factors to their child that make their child more likely to engage in aggressive behavior (Rhee & Waldman).

When considering violence from a developmental psychology perspective, children's early stages of development impact their behavior at later stages and could be associated with violence. If children do not develop appropriate social skills, emotional control, and behavioral control during their first years of life, it can be difficult for them to function well in later developmental stages of life. Poor functioning then places them at risk for developing aggression (Cicchetti & Toth, 1995).

Terrie Moffitt (1993) proposed a dual pathway developmental theory of violent behavior. Their theory categorizes violent, delinquent adolescents according to their age at the time of onset of problem behavior. Some of these adolescents are categorized as life course persistent offenders, who begin exhibiting violent or delinquent behaviors early in life and continue to engage in this problem behavior throughout adolescence. The other adolescents are categorized as adolescent limited offenders, who begin behaving violently or delinquently later in life and cease to engage in these problematic behaviors after some time (Moffitt).

Similar to Moffitt's theory, David Farrington's (2005) integrated cognitive antisocial potential theory categorizes individuals according to long-term antisocial potential and short-term antisocial potential. People's antisocial potential is their likelihood of engaging in antisocial behaviors based on the presence of risk factors and cognitive thought processes that predispose people to become violent (Farrington). Short-term risk factors increase an individual's likelihood of behaving violently in a specific situation. Short-term risk factors include not having a guardian present, being with other violent individuals, or being under the influence of drugs or alcohol. However, only people with long-term risk factors (e.g., impulsivity, poor academic performance, or poor social skills), which predispose them towards



antisocial behavior, are persuaded by short-term risk factors and consequently behave violently in a specific situation (Van der Laan, Blom, & Kleemans, 2009).

According to social learning theory (Bandura, 1977), people learn behavior through a process of vicarious learning, which occurs through symbolic processes, rather than direct experience. When vicarious learning occurs, an observer witnesses a person (e.g., model) behaving in a particular way and learns from the consequences the person receives for that behavior, rather than experiencing the behavior and consequences themselves. In line with this theory, individuals learn to behave violently by seeing other people in their lives behave violently. Seeing violence modeled by parents, friends, and other significant people in a child's life teaches the child that aggression is an acceptable form of expression and an efficient strategy for meeting their needs.

Attachment theory focuses on the relationships between children and their caregivers. The quality of the bonds between children and caregivers can lead to secure attachment or insecure attachment. When a parent provides support and comfort to a child but also displays harm and aggression towards the child, the child forms an insecure attachment, and the child consistently feels confused and anxious. This constant state of confusion and anxiety can bring about violent behavior and aggression in the child (Bowlby, 1969, 1988).

## Research

Exposure to violence has many dimensions because children can engage in, witness, or be victims of violent events within their family, community, school, and through media (Schechter & Willheim, 2009). The association between adverse social and emotional outcomes and exposure to violence, even at a young age, is well documented (Schechter & Willheim). For example, cruelty to animals during childhood is associated with future violence towards humans in adulthood (Merz-Perez & Heide, 2003).

In order to understand the development of violence in children, researchers often assess the contexts in which children may be exposed to violence in the family, community, school, and through the media as a predictor of future violent behaviors later in life. However, in many instances, it is the combination of contexts that gives rise to the development of later violent behavior.

Family violence occurs when a child experiences or witnesses violent acts such as neglect, sexual or physical abuse (i.e., leaving bruises or marks on the skin), or intimate partner violence involving family members or caretakers (Schechter & Willheim, 2009). Briggs-Gowan and colleagues (2010) found that clinically referred children as young as 24 months who witnessed family violence and their parents' distress as a result (i.e., witnessing someone hit, push, or kick a family member or seen someone use a weapon to threaten or hurt a family member) displayed more symptoms of separation anxiety disorder and conduct problems characterized by aggressive and delinquent behavior. Gover, Kaukinen and Fox (2008) found that girls who witnessed paternal abuse as a child were more likely to be victims of physical violence in dating relationships.

Exposure to violence in the community or community violence can include a child witnessing violent victimization of neighbors, friends, or family or being violently victimized themselves (Shahinfar, Fox, & Leavitt, 2000). Kia-Keating (2006) found that common community characteristics that contribute to the development of violent behaviors due to higher violence exposure are communities with high concentrations of poverty, high ethnic heterogeneity, and high residential mobility, and elevated neighborhood violence can contribute to the development of future violent behaviors. Further, Stein, Jaycox, Kataoka, Rhodes, and Vestal (2003) found in their longitudinal study that urban, low-income, and predominately minority communities had a higher likelihood of presenting higher rates of community violence. Some research has shown that the higher rates of community violence within such neighborhoods can be attributed to the number of individuals in

the neighborhood who live in poverty which in turn can result in a lack of social organization within the community (APA Task Force on Urban Psychology, n.d.). A specific type of community violence which contributes to community violence exposure is gang involvement. Gangs may use severe violence to intimidate rival gangs and to create territories to establish the necessary status for engaging in criminal activities (Struyk, 2006). Research suggests that there may be a correlation between exposure to gangs and delinquent and violent behaviors among youth. Dishion et al. (2005) found that youth who engage in antisocial behavior also had deviant peer relationships and were reported to affiliate with gangs.

Research has shown that exposure to violence in media (i.e., video games, television, and movies) is associated with involvement in real-life violent events. Schechter (2006) found a relationship between family preferences for viewing media with violence and the likelihood that the caregiver of the young child experienced real traumatization. However, Boxer, Huesmann, Bushman, O'Brien, and Mocerri (2009) discussed that although there has been research to indicate that exposure to media violence has the potential to increase violent behaviors, limited research is available to support the direct association between media violence exposure and child and adolescent engagement in violent acts. Boxer et al. attribute the lack of research on the causal effects of media violence exposure on child and adolescent outcomes to the inherent difficulty in measuring violent behaviors and to limited longitudinal studies examining media violence exposure in children. Despite current limitations in the media violence exposure literature, Boxer and colleagues (2009) found some evidence for the role of media violence exposure in explaining youth violence. In their study of incarcerated juveniles, they found that adjudicated youth who recalled watching violent television shows at ages 7 or 8 were at greater risk for engaging in violent behavior and aggression at ages 15 and 16 years old. Additionally, media violence exposure significantly contributed to the prediction of violence and aggression in these youth after

controlling for other risk factors for violence such as community violence exposure and presenting traits of psychopathology (i.e., callousness and psychoticism).

Although schools seek to provide a positive and safe climate for all students, schools unfortunately are not immune to violence especially if the community around the school reinforces violence. School violence can include any acts of violence on school grounds such as bullying, fighting, school shootings, and involvement in gang activity. High levels of violence within the school setting contribute to lower levels of perceived school climate by students. School climate is defined as the perception from students that they are supported by teachers and peers and the perceived level of safety of that they experience in their school (Hoy, Smith, & Sweetland, 2002). Research has shown that a perceived positive school climate is associated with a reduction of violent behaviors at school. Eliot, Cornell, Gregory, and Fan (2010) found that a positive perception of school climate was associated with students' willingness to seek assistance from school staff related to interpersonal issues surrounding bullying and threats of violence. Conversely, school climates that reinforce delinquency by giving unclear rules and inconsistent consequences are related to students exhibiting higher levels of antisocial behaviors at a school (Welsh, Stokes, & Greene, 2000).

## Strategies

Because violence is a complex and multifaceted problem, interventions that successfully address and prevent it must be wide reaching. Thus, the most promising research-supported interventions for violence in children and youth address the problem on multiple levels by simultaneously targeting individual, social, and/or environmental risk factors. Conversely, programs that take a "one size fits all" approach to addressing violence, such as zero tolerance policies, have generally been shown to be ineffective or even detrimental.

## Strategies That Work

**Community and Gang Violence.** The “pulling levers” approach has shown preliminary promise for reducing rates of youth homicide communities. The pulling levers approach involves careful identification and targeting of specific individuals, gangs, and situations responsible for a disproportionately high number of youth homicides, specifically homicides due to gun violence (Braga, Kennedy, Waring, & Piehl, 2001). Once these individuals and situations have been targeted, they become the focus of a “workgroup” comprised of police officers, street workers (i.e., social workers, clergy members, and other volunteers who work to help gang members and prevent gang violence), and community groups, including churches that attempt to target gang involvement as a community. Police officers, probation officers, and others in the criminal justice system convey to gang members that gang-related youth homicides will be swiftly and severely addressed by the police and legal system, and steps are taken to see that youth homicides are indeed addressed in a swift, meaningful, and serious manner. Simultaneously, access to community and social service resources is heavily facilitated by both the criminal justice system and community partners involved in the workgroup in hopes of addressing the social, economic, and community issues that may underlie gang violence. Cooperation and coordination among police, legal, and community partners and intensive targeting are key elements of these programs.

Braga and colleagues (2001) evaluated the impact of the pulling levers strategy as part of Boston’s Operation Ceasefire initiative in the mid- to late 1990s. Not only did youth homicides in Boston decrease in a pre-post comparison of monthly youth homicides, but youth homicide rates also decreased at a greater rate than that of other large cities during the same period, suggesting the possibility of a causal intervention effect. The evaluation of a similar pulling levers gun violence intervention program in Stockton, California, yielded similar results in both simple pre-post comparisons and comparisons to the homicide rate trends of other cities within the

same timeframe (Braga, 2008). Furthermore, Corsaro and McGarrell (2009) found that not only did a pulling levers intervention implemented in Indianapolis decrease gun violence homicide significantly compared to pre-intervention rates, but the decrease was significantly more pronounced for gang-related versus non-gang-related violence. Because pulling levers programs specifically target gang-related gun violence, these results give further support to the possibility of an intervention effect, in spite of the inability to conduct a “true” randomized controlled trial of this type of intervention.

Multisystemic therapy (MST) is a therapy targeted towards youth who are serious violent and/or chronic offenders. MST is designed to address the multitude of family, peer, contextual, and individual factors that lead to recidivism rates among criminal offenders (Schaeffer & Borduin, 2005). A series of research studies by the creators of MST in the 1990s found that the intervention significantly reduced recidivism rates in arrested or previously incarcerated youth with histories of chronic, violent offending and that it generally produced superior outcomes compared to individual therapy (for a review, see Schaeffer and Borduin). Additionally, Schaeffer and Borduin conducted a 10-year follow-up of 176 adults who had participated in a randomized clinical trial of MST versus individual therapy as adolescents; at the time of the original study, just under half of the participants had at least one violent offense on record. At the 10-year follow-up, participants who had been randomized to the MST condition had significantly fewer violent and nonviolent adult offenses than those who had been randomized into the individual therapy condition, suggesting that MST may have significant long-term effects on violent behavior as well. While MST is not a preventive intervention, it could be an effective treatment.

## Strategies That Might Work

**Community and Gang Violence.** The Gang Resistance Education and Training II (GREAT II) program is a middle school gang-involvement prevention program that trains police officers to deliver a gang-involvement resistance curriculum

to middle school students (Esbensen et al., 2011). The original GREAT program was similar to the Drug Abuse Resistance Education (DARE) program and was similarly ineffective in achieving its target outcome (i.e., reducing gang involvement). Following the disappointing results of the evaluation of the original GREAT program, the curriculum, training, and evaluation methods were significantly revised. Esbensen and colleagues conducted a longitudinal randomized controlled trial across 195 classrooms in 31 middle schools in several cities determined to have high rates of gang activity. A 1-year follow-up suggests students who participated in the GREAT II program have significantly lower rates of gang involvement compared to the control group and were more likely to resist peer pressure and use refusal skills, although no significant group differences for delinquency were found. More research is needed to establish the efficacy, effectiveness, and long-term impact of the program.

**Bullying.** In general, bullying prevention programs have shown low-to-minimal efficacy in decreasing actual bullying behavior among students (Merrell et al., 2008). However, there are some packaged bullying intervention programs that have promising – although not conclusive – empirical support. The Olweus Bullying Prevention Program (OBPP) was developed in the mid-1980s in response, in part, to bullying-related suicides in Norway (Limber, 2011). OBPP is a multi-tier, multifaceted program that involves school-wide, classroom-level, and individual intervention strategies as well as involvement from the community in order to address, intervene in, and prevent bullying in schools. The program involves a bullying prevention coordination committee of administrators, teachers, school-based mental health professionals (e.g., school counselors and school psychologists), parents, and others who make school-wide decisions and oversee the implementation of the program. Although the program has produced significant reductions in bullying in many Norwegian and other European schools (Limber), studies of OBPP in US schools have produced mixed results – in some US studies, the program did not produce significant or notable

declines in bullying behavior among students – suggesting that the program may not translate well or be as feasible in the American school system (Merrell et al., 2008).

**Aggression.** Similar to bullying prevention programs, the research on school-based aggression prevention programs have yielded mixed findings, with many studies demonstrating effectiveness in reducing correlates of aggression and emotional behavioral regulation (e.g., prosocial skills, increased academic achievement), but inconsistent evidence for reducing aggression *per se*. However, the Second Step program has been identified as a promising program in reducing youth aggression. The Second Step is a classroom-based prevention program developed by the Committee for Children as an intervention to decrease aggression and increase prosocial behavior in children and adolescents. Grossman and colleagues (1997) conducted a year-long evaluation of Second Step with 790 second and third-grade children. Teacher reports and observations indicated a marked decrease in aggressive behavior and increase in prosocial behavior in children in the program, and researchers reported that these results were maintained at a 6-month follow-up. Cooke and colleagues (2007) evaluated the effects of the program on a sample of 741 third and fourth graders who were among 986 elementary school-age children in the Second Step program as part of a citywide implementation. Again, they found significant decreases in aggressive behavior and significant increases in prosocial behavior among the students studied. In a randomized controlled trial of the Second Step program in seven intervention and eight control schools, students in the program showed significantly lower aggression and significantly greater prosocial behavior than those not receiving the program (Frey, Nolen, Edstrom, & Hirschstein, 2005).

Although the results of studies of Second Step have been generally positive, several studies have found that the program is not consistently effective across gender and grade. For example, a controlled evaluation of the Second Step program with Norwegian fifth and sixth graders

showed some promising pre-post and group intervention effects for social competence and externalizing behavior, although results varied by both grade and gender (Holsen, Smith, & Frey, 2008). Similarly, a study of Second Step in 109 low-income preschool and kindergarten students found that decreases in problem and disruptive behavior varied both by grade and how the outcome was measured, providing inconsistent results in this domain (McMahon, Washburn, Felix, Yakin, & Childrey, 2000). Further research is needed to better understand the efficacy and limits of this program.

**School Violence.** The Virginia Student Threat Assessment Guidelines were developed in order to provide a uniform, systematic way for school personnel to address and evaluate violent threats made by students in order to prevent fatal school violence (Cornell & Allen, 2011). These guidelines can be used for threats ranging from threats of bullying (e.g., "I'm going to beat him up!") to threatened school bombings or shootings. By allowing for a systematic and thorough understanding of each threat, these guidelines allow schools to address threats and the students who make them in an individualized, effective, and fair manner. They also provide guidance on how threats may be appropriately remediated; this sharply differentiates them from ineffective zero tolerance policies, which focus solely on severe punishment and fail to address core issues.

The guidelines provide a means by which school administrators and other relevant psychological staff can address the nature of the threat (transient, substantive, or unclear) and the seriousness ("very serious" versus "serious") of the threatened actions, with "very serious" actions including rape, murder, or violence with weapons (Cornell & Allen, 2011). In contrast, "serious" threats include threats unlikely to cause fatal or critical harm, such as threatening to beat another student up. The guidelines also include suggestions for addressing threats depending on their nature and severity, including notifying parents, conducting a mental health evaluation, notifying authorities, creating a written safety plan, and engaging in school-based discipline. Preliminary evaluation studies summarized by Cornell and

Allen suggest that use of the Virginia guidelines may decrease post-threat assessment disciplinary referrals, decrease long-term suspensions, and improve school climate and student willingness to report bullying, while still preventing or reducing the likelihood that threats are carried out. Cornell and Allen report that a randomized controlled trial of the Virginia assessment guidelines versus treatment as usual is currently underway.

### **Strategies That Do Not Work**

Because youth violence, aggression, and bullying are generally considered to be serious social and public health issues, schools and policymakers may feel pressure to respond with "solutions" that sound good but are not supported by research. One of the most prominent examples of this is "zero-tolerance" policies for violence in schools, which have been shown to be both ineffective in preventing violence and detrimental to students and the general school climate (Skiba, 2000). Due to the popularity and serious implications of the ineffectiveness of zero tolerance policies, they will be the primary focus of this section. However, school security measures and profiling will also be discussed as examples of nonempirically supported treatments.

**Zero Tolerance Policies.** In contrast to the highly individualized, systematic assessments of threats and appropriate consequences in the Virginia Student Threat Assessment guidelines, zero tolerance policies proscribe a "one size fits all" approach to addressing threats and violent or aggressive acts. In practice, this can lead to punishments that are grossly incongruent with the severity of the "crime" or infraction committed, such as involving law enforcement and suspending students for accidentally hitting a school bus driver with a peanut (National Summit on Zero Tolerance [NSZT], 2000). Because these severe, almost automatic punishments frequently involve suspension, students miss substantial portions of coursework and classroom discussion, creating the possibility of serious academic deficiencies and loss of opportunity as a result (NSZT). Additionally, out-of-school suspensions may place high levels of stress and burden on families, particularly

those who are unable to supervise the student during his or her suspension (NSZT).

Furthermore, zero tolerance policies and their focus on severe punishment may negatively impact school climate. Students may react to seemingly draconian disciplinary policies by acting out or becoming resentful of school officials, thus creating a negative school climate characterized by hostility and resistance (Skiba, 2000). Because these policies are purely reactive in nature, they leave little or no room to actually try to remediate problems among students or support the development of a positive and mutually supportive school climate (NSZT, 2000). Additionally, zero tolerance policies have been shown to disproportionately affect students who are racial and ethnic minorities, particularly African American students, and students with disabilities, indicating that these policies may, in practice, infringe on some students' civil rights.

**School Security Measures.** Similarly, in their review of the literature, Borum, Cornell, Modzeleski, and Jimerson (2010) also note that little to no evidence supports the effectiveness of mental detectors, video cameras, identification badges, and other such "security measures" in reducing school violence, despite their popularity as highly visible ways of responding to public concerns about school violence. Skiba (2000) also notes the lack of evidence for the effectiveness of such security measures and notes that some research suggests that well-understood and enforced school rules are more effective than security measures at decreasing student fighting and aggression. Additionally, such measures have the potential to negatively impact school climate by creating an atmosphere of fear and suspension.

**Profiling of Potential School Shooters.** Borum and colleagues (2010) also note that "profiling" potential school shooters – as contrasted with a systematic threat assessment program – is ineffective and impractical at the individual level. Although statistical modeling suggests some predictor variables correlate significantly with school shooter profiles retrospectively, these variables are unlikely to reliably identify potentially violent students in a way that helps prevent violence (Borum et al.).

## Summary

The prevention of youth violence is a national public health concern due to the negative impact of violence on the physical and mental health and educational and the economic trajectories of youth. It is important to note that while there are unique risk factors that predict youth violence, individual differences such as child temperament and psychiatric history, as well as risk presence and risk for mental health disorders, can also play a part in the developmental trajectory of violence (Bardick & Bernes, 2008). Whereas the combination to violence exposure in a number of settings plays a central role in children's engagement in violent behavior, not all children exposed to violence will engage in violent behaviors in the future. Thus, it is recommended that person-centered approach to understanding risk for violence be adopted. In general, research suggests that *proactive*, not *reactive*, interventions are the key to effectively addressing and decreasing violence in schools and among youth. Given the multifaceted and systemic causes and consequences of violence, it is imperative that violence prevention programs adopt a multi-tier approach with primary, secondary, and tertiary prevention components implemented simultaneously across settings. Currently, violence prevention programs are isolated to a single context, schools, or community mental health centers, with little integration of the implementation of violence prevention programs across contexts in which children spend most of their time, schools, out-of-school time programs, churches, or religious centers. In order to effectively reduce violence for youths most at risk for experiencing violence, a multisystemic approach to violence prevention is critical.

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## Violence Prevention During Early Childhood

Jannette Rey Todaro  
Providence Behavioral Health Associates,  
Providence, RI, USA

### Introduction

Youth violence, childhood psychopathology, and its behavioral sequelae in the early childhood period (up to age 5) have been well documented in the last decade (Angold & Egger, 2007; Wakschlag, Tolan, & Leventhal, 2010). Early antisocial behavior and, indeed, a behavior disorder diagnosis early in life (i.e., prior to age 10) have been found to increase the risk of violence later in adulthood (Loeber et al., 2005). Relatedly, the explosion of research in the field of epigenetics, neurodevelopmental processes, and maternal-fetal pathways has provided a rich evidence base in this third millennium for consideration of the strength of epigenetic factors in affecting gene transcription and, subsequently, predicting behavioral outcomes (Liu, 2010; National Alliance for Research Progress, 2008).

Psychosocial interventions in the last decade have been characterized by a steady effort toward emphasizing adoption and implementation of primary prevention and early intervention programs to address youth violence (Tremblay, 2006). In the field of youth violence, it is well accepted that preventive interventions are best when they account for the transactional nature of child-specific characteristics and the context within which the child develops (Brotman et al., 2008) and are developmentally based (Cicchetti & Toth, 2009). Clinical research in youth violence now not only involves assessing the efficacy and effectiveness of preventive interventions for treating early childhood psychopathology but also for subclinical populations where health risk factors (biological and psychosocial environments combined) are at play. What remains clear in clinical research outcomes over the past decade is that the benefit of youth violence

prevention, whether applied during pregnancy to address maternal-fetal pathways or in the pre-school period of early childhood, continues to outweigh the cost in terms of improved mental health and productivity across the lifespan (SAMHSA, 2007). This entry is designed to provide a review of youth violence during this unique period of development as well as to summarize key research and intervention outcomes.

### Definitions and Scope

The study of the development of and reliance on violent behavior in childhood has led to a wealth of scholarly research regarding precursors, mediators and moderators, as well as developmental trajectories across various subpopulations. Youth violence as a discrete behavioral target, however, is not easily linked to current clinical research literature and, therefore, can affect accurate extrapolations from study findings. Indeed, experts in the fields of human development, childhood conduct/externalizing behaviors and disorders, youth violence intervention and prevention, juvenile justice, and externalizing behaviors point to the persistent struggle when characterizing youth violence different from normative misbehaviors of childhood (Kumpfer & Alvarado, 2003; Loeber et al., 2005; Wakschlag et al., 2010). Given the multifaceted (e.g., severity, course) and developmentally linked nature of the construct of youth violence as well as the inherent variations, the term “youth violence” will be utilized in this entry to refer to those relevant externalizing behaviors most commonly identified in explanatory and intervention models for the early childhood period: physical aggression and conduct problem behaviors (e.g., bullying, antisocial behavior) (Tremblay, 2006) rather than temperamental variables (e.g., irritability, hostility, negativistic attitude) associated with defiance or oppositionality (Rowe, Costello, Angold, Copeland, & Maughan, 2010).

The scope of impact of youth violence extends globally and can yield a significant burden across all levels of global functioning in terms of

financial, psychological, and societal functioning (Weaver, Borkowski, & Whitman, 2008). Homicide, for example, continues to be one of the leading causes of death in youth ages 15–24 years and remarkably accounts for 41 % of the global incidence of homicide for youth aged 10–29 years (Centers for Disease Control [CDC], 2012; Krug, Dahlberg, & Mercy, 2002). Global nonfatal violence also continues to be high, with exposure rates to bullying or physical aggression ranging from 5 % to 35 % for girls and 8–45 % for boys (CDC, 2009; Krug et al.). The prevalence of externalizing behaviors in youth where intensity and frequency meet thresholds for a behavior disorder continues to be relatively large, with study estimates ranging from 2 % to 16 % of youth (SAMHSA, 2007). Notably, prevalence of conduct problems in early childhood has been found to be similar across diverse global populations (Rescorla et al., 2011). The alarming pattern of aggression amongst youth has catapulted the issue of violence, particularly bullying, to the forefront of school and community agendas across the United States and other countries worldwide (Olweus, 2004).

## Theories

Current theories of youth violence have largely examined biopsychosocial and ecological processes and point to the need for considering transactional-developmental contexts. For example, studies designed to test theories of developmental trajectories continue to provide support for a pathway model of violence whereby factors early in a child's life (e.g., childhood conduct problems, neurocognitive problems, parental conflict, low self-esteem) predict delinquency later in life (Fergusson, Horwood, & Ridder, 2005). More recently, neurodevelopment, epigenetics, and phenotype expression have greatly contributed to expanding the depth and breadth of explanatory models of violence.

Robust risk factors and correlates continue to be identified in the research on the development of early childhood violence. Approximately

one-half of all children entering kindergarten have been found to be exposed to at least one risk factor. In terms of early health risk factors present during the prenatal stage, for example, research has identified key factors such as smoking during pregnancy, lead exposure, child abuse, and maternal stress as potent factors in predicting later aggressive behavior (Liu, 2010). The recent decade of studies in youth violence continue to highlight the role of previously identified child-based risk factors such as hyperactivity and history of aggressive behavior (Rowe et al., 2010). During the toddler and preschool period, variables such as young childhood age of onset of violence or antisocial cognitive patterns also have been found to be strong predictors of later youth violence (Farrington, 2005). In fact, research regarding the longitudinal stability of conduct problems has also highlighted that conduct problems first identified in the preschool years are as strong a predictor for later deviance as conduct problems beginning in the elementary school-age years (Bilancia & Rescorla, 2010). Risk factors related to family and peers include such variables as low parental involvement, low family income, and parental substance abuse or criminality (Wilson, 2004). Finally, communities lacking adequate social cohesion or stability as well as high rates of conflict and/or violent crime increase the probability of youth violence and the development of conduct problems (Commission on Children at Risk, 2003).

## Current Research

The research literature on physical aggression in childhood has produced a large knowledge base about effective preventive strategies for addressing youth violence. In the last decade, programs at the local, regional, and federal level (e.g., National Academic Centers of Excellence on Youth Violence, NIMH Prevention Research Program) have produced substantial evidence pointing to several stable trajectory patterns (SAMHSA, 2011). Data for birth cohorts studied longitudinally suggest a common onset of

aggression during the midpoint of toddlerhood (Rowe et al., 2010). By the age of 6, for example, behavioral rehearsal in social interactions typically has been found to be characterized by the young child's use of physical contact as a way to initiate or terminate interaction. For those children who continue to demonstrate defiance into early childhood, researchers have found that the probability for later emotional maladjustment was more likely than serious conduct problems. However, early onset of serious conduct behavior problems is more likely to result in serious delinquency later in life (Campbell, Spieker, Burchinal, Poe, & The NICHD Early Child Care Research Network, 2006; Webster-Stratton & Reid, 2010). In terms of sex differences, recent studies indicate this pattern is especially true for boys (Rowe et al., 2010). Epigenetics research has underscored the contribution protective factors have on the maternal-fetal pathway. Specifically, adverse neurodevelopment of the fetus compromises the child's resilience while also increasing vulnerability to risk factors (Liu, 2010). Interventions that target risk factors such as aggression in early childhood, then, continue to be most useful in achieving outcomes that impact later behavioral patterns in adolescence and beyond (Greenberg, Domitrovich, & Bumbarger, 2000; Loeber et al., 2005).

Theories of human ecology (Bronfenbrenner, 1992) and attachment (Bowlby, 1969) are common theoretical underpinnings for preventive intervention models. More recently, the contribution of individual factors and process (e.g., executive functioning, self-efficacy) has become integral in many program frameworks and the resulting focus on building resiliency in the child as well as enhancing the child's context for development.

## Strategies

The goal of altering the presence or impact of risk factors in early childhood has been one of the driving goals in violence prevention clinical research, particularly due to their cumulative negative influence on individual and

community-wide health both short and long term. Since the 1990s when studies on youth violence prevention began to flourish, the knowledge base has broadened and deepened to go beyond addressing the impact of risk factors alone. Rather, empirical support has been most robust where programs have been culturally appropriate, implemented with adequate fidelity, and targeted the enhancement of protective factors as well (Webster-Stratton & Reid, 2010). As such, a critical trend in this past decade has been toward early childhood intervention programs that focus on both the individual child and additional multiple ecological systems (e.g., family, early childhood learning environments) (Forehand et al., 2011). These comprehensive preventive interventions have been found to impact individual short-term and long-term adaptive outcomes as well as producing multisystem advantages (e.g., economic costs to society, enhanced quality of life at the community level).

The public health approach evident in current strategies in violence prevention interventions relies on a process whereby data is used to identify problem targets and relevant risk and protective factors. Then, via monitoring and evaluation, dissemination involves providing education for widespread adoption of the components found to promote health and prevent illness. In this context, all members of a target community are affected by the well-being of the individuals within that community. Since 2000, following recommendations by the Institute of Medicine, the prevention model was expanded to include not only those interventions that occur after the onset of a disorder (primary, secondary, tertiary prevention) but also those that target prevention of the onset (universal, selective, indicated prevention) based on the degree of risk of onset (Institute of Medicine [IOM], 2000, 2009). Interventions describe herein will largely fit into one of the latter classification categories. Therefore, universal preventive interventions will include programming that is applied to everyone within the population, while selective preventive interventions are designed for individuals with risk of developing the target mental health problem. Finally, indicated preventive interventions are



targeted at individuals who demonstrate some aspects of the mental health problem but fall below diagnostically significant levels. The sections that follow outline notable programs within these classifications and are grouped according to outcomes based on effectiveness trials where available. “What Works” refers to interventions with at least three successful trials, whereas “What Is Promising” will describe those interventions with fewer than three successful trials or mixed trial results.

## What Works

Enhancing prosocial skills of the individual child, enriching the quality of the parent-child interaction, and improving the contextual aspects of the child’s learning environment (caregiver behavior management practices, generalization of skills) reflect primary components across the group of most effective violence prevention interventions for young children (Reyno & McGrath, 2006). A model prevention intervention during the early childhood period is The Nurse-Family Partnership (Olds, Hill, Mihalic, & O’Brien, 1998). The NFP, a selective intervention, is a home visitation service delivered by nurses that focuses on improving maternal prenatal health and mother-child healthy bonding and well-being through the first 2 years of the child’s life for at-risk expectant mothers. The five target mother-child outcome domains include physical and mental health, home/neighborhood environment, family/friend support, parental roles, and major life events (e.g., education, employment). Follow-up studies of program participants found that, when compared to a control group, the treatment group demonstrated significant reductions in child abuse or neglect, maternal substance abuse-related problems, maternal arrest rates, and high-risk behaviors.

Similarly, violence prevention in the early childhood preschool population has been consistently demonstrated in clinical research of The Incredible Years Program (IYP; Webster-Stratton & Reid, 2010) and in Parent-child Interaction Therapy (Boggs et al., 2004). These

interventions target enhancement of the ecology of the caregiver-child relationship to prevent the development of conduct problems in later youth for young children at risk for violence. In the IYP intervention, children between the ages of 2–10 years and their parents, teachers, and caregivers participate in a multifaceted and developmentally based curricula designed to prevent and reduce the occurrence of aggressive and oppositional behavior in children. Treatment outcome studies point to robust outcomes whereby children in the intervention group demonstrated more effective problem-solving skills, greater use of prosocial play skills, and reduced oppositional and conduct problems both at home and school as compared to control group counterparts (Webster-Stratton, Reid, & Beauchaine, 2011). For young children below the age of 8 with externalizing behavior disorders, PCIT also helps parents build specific skills to establish or strengthen a nurturing and secure relationship with their child while encouraging prosocial behavior and discouraging negative behavior (Borden, Schultz, Herman, & Brooks, 2010). Significant treatment effects have been found for treatment families as well as for those families with a history of physical abuse, children with prenatal substance exposure, and children with developmental disabilities. Recent promising data for an abbreviated version of PCIT (i.e., four-session version for primary care PC-PCIT) highlights the utility of preventive interventions for preschool-aged children with subclinical behavior problems (Berkovits, O’Brien, Carter, & Eyberg, 2010). The Perry Preschool Program (Schweinhart et al., 2005) incorporates both a home visit modality of treatment delivery as well as targeting individual and context variables. Designed in particular for young children living in poverty, the intervention also aims to enhance the child’s active engagement and confidence in their cognitive and readiness skills for social and school success. When compared to control groups, longitudinal studies of children from the intervention groups indicate lower rates of criminality and reliance on social welfare as well as higher rates of home ownership and greater employment earning.



For young children beginning their school career (4–5 years of age), the preschool version of Promoting Alternative Thinking Strategies (Preschool PATHS) (Greenberg et al., 2000) is a groupwide social-emotional learning curriculum with direct instruction for key areas related to positive mental health outcomes (i.e., self-control, emotional awareness, peer relations, and problem solving). In studies examining program effectiveness, significant positive effects on behavior and the general mood of the classroom was demonstrated (Conduct Problems Prevention Research Group, 1999).

### What Is Promising

While enhancing social adjustment and promoting prosocial development during early childhood have been fruitful targets of interest for violence prevention programming, achieving long-lasting positive individual and systemic change has been elusive for numerous evidence-based interventions. To this point, researchers in the areas of implementation science have described the marked reduction in treatment effects accounted for by factors solely related to inadequate planning for fidelity and sustainability (Fixsen et al., 2005). The evidence-based programs listed here, while falling short of criteria utilized for this encyclopedia for effectiveness, are promising in their effects on both proximal and distal risk factors for violence.

The school-based intervention “I Can Problem Solve” (ICPS; Shure, 1997) teaches young children how to effectively generate, evaluate, and utilize solutions to interpersonal problems, as well as factors that help prevent conflict. In small group formats, the interventionists teach problem-solving techniques, utilizing visual graphics, puppets, and behavioral rehearsal incorporating personal examples. Children also build skills in identifying emotions, empathy building, and adapting responses to increase the likelihood of positive outcomes. Treatment outcome studies have revealed significant benefits for children who participated in ICPS as compared to control students. While the studies with robust findings are limited, a large

study of inner city children in the program revealed improved problem-solving skills, greater frequency of prosocial behaviors, and less impulsiveness. These results were maintained at follow-up 3 and 4 years post intervention.

A promising violence prevention program targeting family risk factors for child maltreatment as well as child risk factors for violence (behavioral and emotional problems) is the community-wide version of Triple P (Positive Parenting Program) (Prinz, Sanders, Shapiro, Whitaker, & Lutzker, 2009). This comprehensive, five-level system specifically targets parental competence and modification of dysfunctional parenting practices. Community-based organizations working with the family serve as the program deliverers, moving through five intervention levels beginning with level 1 (informational dissemination to facilitate and destigmatize help seeking) to level 5 (additional practice sessions with individual families toward improving child targets and parental communication). Compared to control communities, treatment outcome studies suggest significant reductions in substantiated child maltreatment, child out-of-home placements, and urgent medical care for child maltreatment injuries (Prinz et al., 2009).

Other promising programs in early childhood violence prevention follow the “early starter” model, intervening with at-risk children who demonstrate early conduct problems. First Steps to Success (Walker et al., 1998) in an early intervention program involves both school-based intervention component and parent training. Children are taught replacement skills and receive immediate feedback through the school day via visual real-time cues if meeting behavioral goals for the situation. A follow-up home-based positive reinforcement system is added to promote generalization of the skills across settings. Results of a treatment outcome study conducted with early elementary-aged children suggest significant improvements for those cohorts who received full implementation as compared to controls (Greenberg et al., 2000). A promising empirically validated violence

prevention intervention that can be applied at the whole school level as well as with selective populations is Positive Behavioral Intervention and Supports (PBIS; Horner et al., 2009). The universally applied model of PBIS is characterized by implementation of a whole school, function-based behavior support system whereby all school personnel are the interventionists and key targets are selected based on conduct problems within the given student population. Randomized controlled trials have been conducted in the recent years yielding positive and socially meaningful outcomes related to efficacy; however, further study, replication, and evaluation of implementation variables are necessary to confirm its effectiveness and long-term sustainability.

### What Does Not Work

In the past decade, it has become more evident that the veracity of conclusions regarding treatment outcome results for violence prevention programs must be interpreted through the lens of the degree and fidelity of program adoption and implementation. Thus, much research in violence prevention interventions that have utilized rigorous study designs but have failed to plan to an adequate extent for fidelity and broad adoption and implementation over time has led to long lists of what began as promising models but ended as not empirically supported. Character education programs that target the development of core values linked to corresponding cognitive and behavioral patterns is one such intervention group whose research has yielded mixed results (Sanchez, 2005) or too few studies evaluating their effectiveness for youth in early childhood. Similarly, despite a model program for bullying prevention at the elementary and secondary levels for students, community entities such as school teams commonly deconstruct these interventions and opt for only a portion of the intervention (e.g., signing a anti-bullying statement) and erroneously consider their systems enhanced (Ryan & Smith, 2009). Similarly, full implementation of interventions that are not

evidence-based or based on poor research design unfortunately become disseminated and lead to unintended or, worse yet, negative results. A review conducted by Ryan and Smith of violence prevention studies for older youth points to the all too common problematic designs and evaluation practices that comprise this area of research, with over one-third of the evaluations examined falling short of fully utilizing an RCT design, evaluating the impact on bullying before adequate spacing from the point of initial full launch, and relying on a single information for the key outcome measure despite empirical evidence regarding its potential for biased data. Finally, violence prevention programs that rely solely on any one aspect of intervention implementation (e.g., training, system reorganization, dissemination of information) continue to yield poor or inconclusive results with estimates of 5–20 % of the interventions achieving their intended results (Fixsen et al., 2005).

### Summary

Advancing the adoption and quality implementation of violence prevention programming for young children requires multiple system involvement, if just for improving the nature of long-term sustainability and fidelity of implementation by the interventionists. Such systems restructuring is possible and probable when stakeholders, and particularly the program practitioners, collaborate with program developers and implementation support persons around the key targets and goals of interest. Further, outcomes of the collaboration should inform specific planning around efficient implementation (e.g., build on existing programming) as well as systematic information dissemination despite changing personnel.

Incidents of school-based violence have persisted at problematic levels into this millennium. As such, efforts have grown exponentially toward pushing the limits of ethical boundaries for earlier detection (e.g., prenatal) and identification of violence-prone “markers” in early stages of development. This wave of

methodology relatively new to the field of violence prevention includes standardizing the inclusion of biological data collection as a study variable for pinpointing mediators and moderators of violence both in nonclinical and clinical populations. The ethical challenges therein points to the need more than ever for ongoing rigorous RCTs that must incorporate greater planning for and evaluation of implementation integrity as a rule so as to accurately inform predictive models. Burgeoning data sets from the world of neuroscience research underscores the need for the science and practice of prevention to continue to move boldly in all directions that support multilevel, multisystem, and sustainability planning collaboration and results. The need for fervent activity in the area of early childhood violence prevention and, more broadly, promotion of positive mental health outcomes for all youth via legislative, programmatic, and research progress is vital.

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