Positive Behavior Support

15

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Introduction

Positive behavior support (PBS) is emerging as a primary approach for addressing problem behavior within educational, disability, and community support settings (Odom, Horner, Snell, & Blacher, 2007). Frequent and severe problem behaviors are a major cause of isolation and exclusion for people with disabilities (Koegel et al., 1996; Lehr & Brown, 1996; National Institutes of Health, 1989; Reichle, 1990). Between 10 and 40 % of children with disabilities display frequent and severe problem behaviors (Durand, 2015; Einfeld, Tonge, & Rees, 2001; Lowe et al., 2007), and current epidemiological estimates suggest 15–20 % of individuals with intellectual disabilities exhibit one or more types of problem behavior (Emerson et al., 2001; Lowe et al., 2007; Reichle & Moore, 2014). Moreover, problem behaviors are increasingly more likely among individuals who experience severe and multiple developmental disabilities (Harvey, Boer, Meyer, & Evans, 2009; Reichle & Moore, 2014).

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Problem behaviors such as self-injury, aggression, property destruction, defiance, tantrums, and disruption are highly prevalent among children and adults with a variety of developmental disorders (Durand, 2015). Such behaviors prove to be major barriers to the social, vocational, educational, and physical success of the individual (Carr et al., 1999a, 1999b). Fundamental life elements such as family dynamics (Cole & Meyer, 1989), education (Koegel & Covert, 1972), and employment (Hayes, 1987) are significantly strained by the presence of problem behaviors.

In the absence of effective supports, individuals with disabilities who exhibit problem behaviors are susceptible to exclusion from regular educational settings, community environments, and employment opportunities; increased medical risks; isolation from social relationships; and exposure to highly intrusive forms of treatment (Horner, 1999; Horner, Diemer, & Brazeau, 1992; Knitzer, 1993; Sailor & Skrtic, 1995). Likewise, families are challenged and parental stress is shown to increase when caring for a child with problem behavior (Brown, MacAdam-Crisp, Wang, & Iarocci, 2006; Malick-Seltzer & Krauss, 2001; Mugno, Ruta, D'Arrigo, & Mazzone, 2007; Werner et al., 2009).

Behavioral support for individuals with disabilities has undergone dramatic advances in recent decades and improved the ability of educators, families, and community clinicians to

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support students with severe disabilities and problem behaviors (Horner & Carr, 1997). These advances have occurred in part due to the careful construction of effective intervention procedures and in part due to a recasting of the focus of behavioral support. Behavioral support has shifted from a punishment-based logic to an approach emphasizing teaching of desired behavior, rewarding desired behavior, and systematically withholding rewards for problem behavior. To a very great extent, effective behavioral support in the twenty-first century is about engineering settings (schools, homes, workplaces) so that problem behaviors become less likely and desired behaviors become more likely.

PBS is a general term referring to the application of interventions and systems to achieve socially important behavior change (Sugai et al., 1999). PBS includes skills that increase the likelihood of success and personal satisfaction in normative academic, work, social, recreational, community, and family settings (Carr et al., 2002). PBS involves the assessment and reengineering of environments so people with problem behaviors experience reductions in their problem behaviors and increased social, personal, and professional quality in their lives (Horner, 1999). The technology represents application of behavior analysis to the social challenges resulting from behaviors such as self-injury, aggression, property destruction, defiance, tantrums, and disruption.

Though the origins of the PBS technology are in providing an alternative to aversive interventions used with students with significant disabilities who engaged in extreme forms of self-injury and aggression, PBS has demonstrated success in its application with wide ranges of individuals and contexts. PBS is an approach that blends values about the rights of people with disabilities with a practical science about how learning and behavior change occur. What was once an intervention approach for individuals is now an evidence-based approach for entire systems (Sugai et al., 1999).

PBS is neither a new intervention package nor a new theory of behavior. It is the application of a behaviorally based systems approach for enhancing the capacity of schools, families, and communities to design effective environments that improve the fit or link between research-validated practices and the environments in which teaching and learning occur. Attention is focused on creating and sustaining environments that improve lifestyle results (personal, health, social, family, work, recreation, etc.) for all individuals by making problem behavior less effective, efficient, and relevant and desired behavior more functional (Sugai et al., 1999). Improved lifestyle results equate to an improved quality of life (QOL). The emergence of PBS as a field is due in large part to the technology's focus on improving the QOL of individuals with disabilities (Dunlap, Sailor, Horner, & Sugai, 2009).

The purpose of this chapter is to offer a perspective on the development of PBS beginnings in the late 1980s to its current, strong and healthy state. We begin with a clear understanding of PBS by identifying the context of its development and describing its defining characteristics. Next, we review the current role of PBS in the support of individuals with disabilities and its application to larger social systems. Finally, we describe the future of PBS and its implications for social systems, professional development, data analysis, as well as policy design and implementation.

PBS: Where Did It Come from and Why Was It Created?

PBS combines behavioral science, organizational theory, and social values. Understanding the content and application of PBS requires appreciation of the social standards that guide the use of the technology.

Deinstitutionalization and Normalization

The 1980s bore great change to how services for persons with disabilities should be conceptualized, organized, and provided. The disability rights movement of the time was spurred by the immense national discontent with the large

congregate settings such as state institutions for people with developmental disabilities (then referred to as "mentally retarded"; Lucyshyn, Dunlap, & Freeman, 2015). The resulting deinstitutionalization movement demonstrated intense conviction to expose the abject, warehouse-like conditions persons with disabilities were subjected to. Blatt and Kaplan's (1966) *Christmas in Purgatory* exposed the conditions of New York's Willowbrook Institution, and the Gannett News Services' exposé entitled Oklahoma Shame (Dubill, 1982) revealed conditions of Hissom and other large institutions in Oklahoma.

The outcome of such revelations was the normalization movement that sought the right to community living and an enhanced quality of life for persons with developmental disabilities (Wolfensberger, 1972). The movement was characterized by the support for people with disabilities to achieve a life as culturally normative as possible, through means that were as culturally normative as possible (Lucyshyn et al., 2015). Normalization advocates sought rights to employment and independent living. Based on the concept that persons with intellectual and/or developmental disabilities who have been socially devalued should be allowed to acquire socially valued roles in typical community environments, normalization supplied a rationale for transitioning people out of large, segregated institutions and into community settings (Nirje, 1994; Singer & Wang, 2009). These values extended to all people, including people who engaged in problem behavior. The normalization movement both established the standard that any intervention technology should be functional for all people and the expectation that an effective intervention technology not only decreased undesirable events but actively established lifestyle outcomes that were substantive, durable, and self-determined.

A History of Aversive Punishers

In addition, the technology of positive behavioral support emerged in contrast to restrictive and punitive behavior management technologies that were promoted during the 1970s and 1980s. Researchers reported success using behavior management technologies reliant on the systematic application of contingent punishment. Punishments included the application of physical pain (i.e., slapping, pinching, electric stimulation) or the use of dehumanizing punishments (i.e., shaving cream in mouth; Lucyshyn et al., 2015). Examples include developmentally disabled individuals being subjected to a device that administered automatic electric shocks (Linscheid, Iwata, Ricketts, Williams, & Griffiths, 1990) and people with autism being forced to wear helmets that emit white noise and spray water in the face (Butterfield, 1985; Linscheid et al., 1990; Singer & Wang, 2009). Such technologies originated in the insulated environments of institutions where early behavior research with people with severe disabilities was conducted. Later known as "aversives," these punishment procedures represented an ideology founded upon the elimination of problem behavior through the delivery of pain, withholding of basic human needs, or social humiliation.

Despite the reported successes associated with the use of such techniques, the techniques themselves were challenged as being unethical. Pinching, slapping, spraying water in face, or providing electric shocks were not viewed as acceptable in community settings and not related to achieving larger lifestyle goals. Given the disability rights movement of the era and the focus on deinstitutionalization and normalization, the use of such aversive procedures in community settings or public education was discouraged. A case in point, public schools in the 1980s were occupied with imposing state-mandated bans on corporal punishment. Administering physically or psychologically painful punishments to students with disabilities was out of the question. Federal lawsuits such as Beard v. Hissom in Oklahoma were confirmatory (Dunlap et al., 2009).

Contentious dissension marred the scientific community of behavior research and the professional community of practice (Repp & Singh, 1990). Behaviorists grappled with how to apply effective and proven behavioral practices in

school, work, and community contexts. Freagon (1990) proposed the question of how the use of highly aversive stimuli to punish unwanted behavior could ever be accepted as a functional technology for reducing problem behavior in community contexts. Meanwhile, there was groundswell continuing to form in support of nonaversive behavior management and committed to the belief that persons with severe disabilities exhibiting challenging behaviors should receive the same respect and dignity as all other members of the community (LaVigna & Donnellan, 1986; Meyer & Evans, 1989).

The strain within the field precipitated a need for research and development on new technologies that (a) could address the same population of individuals (students in schools or adults in community-based facilities), (b) would be socially appropriate and socially acceptable, and (c) would be durable, efficient, and effective (Dunlap et al., 2009).

Toward Nonaversive Behavioral Support

During this time of sweeping reform of services for people with disabilities, the field of behavior management experienced a significant need for a technology of nonaversive behavior intervention that was grounded in science. In 1987, the US Department of Education provided funding for a national research and technical assistance center on the topic of nonaversive behavior management. The faculty of the center published an article detailing the emergence of nonaversive behavioral support technologies that focused on positive, educative procedures that foster the development of adaptive repertoires, as opposed to emphasizing behavioral suppression through aversive contingencies. The faculty introduced the term "positive behavior support" as a successor to nonaversive behavior management (Carr & Durand, 1985; LaVigna & Donnellan, 1986; Meyer & Evans, 1989). PBS became the name associated with the research and practice dedicated to the development of this technology.

PBS is founded in applied behavior analysis (ABA), a social science tradition encompassing almost 50 years of research (Baer, Wolf, & Risley, 1987; Cooper, Heron, & Heward, 2007; Singer & Wang, 2009). Both ABA and PBS are founded upon the belief that human behavior can change. At conception, PBS differed from ABA in that (a) it was established upon the belief that effective positive alternatives to aversive treatments do exist and therefore it is unethical to use harsher procedures (Singer, Gert, & Koegel, 1999) and (b) it demonstrated a commitment to using behavioral interventions for both changing distinct target behaviors and also having a more robust and positive influence on the intervention recipient's quality of life (Singer & Wang, 2009).

From a functional point of view, both ABA and PBS make the assumption that behavior is defined and understood in a context (Singer & Wang, 2009). Indeed, both assume that all lasting behavior is caused and enabled by the environment as)opposed to intra-psychological variables. ABA and PBS conceptualize the environment as the independent variable and the person's behavior as the dependent variable. Within any behavior, there is a functional relationship that exists between the person and repeated patterns of environmental variables. Typically, the environment in question is the social environment, comprised of microsocial interactions between the change agent and person demonstrating the inappropriate behavior (Singer & Wang, 2009). Like ABA, PBS conjectures that recurrent behavior is the composition of antecedent events or variables and reinforcing consequences. PBS believes that the relationship between behavior and environment can be structured according to setting events, established operations, discriminative stimuli, as well as positive and negative reinforcement. Moreover, PBS believes that it is possible to predict and control many targeted problem behaviors once a functional relationship between the behaviors and their relative antecedents and consequences are identified (Singer & Wang, 2009).

PBS is an empirical approach that relies on valid and reliable data to support its practices.

The foundations of PBS interventions are reinforcement and contingency management, functional assessment and functional analysis, shaping and fading, and manipulations of stimulus control and established operations (Dunlap, Carr, Horner, Zarcone, & Schwartz, 2008). The scientific underpinnings of PBS can overshadow its deep commitment to present-day utility for people with problems in behavioral adaptation. PBS emphasizes the generation of immediately applicable knowledge (Dunlap et al., 2008).

A major focus of PBS research is the integration of research with practice, including the analysis and application of factors characteristic of complex social environments (Carr, 1997). PBS is distinct in that it endeavors to make behavior intervention strategies more effective in complex settings and at multiple levels as well as larger scales of implementation. Within PBS, the unit of analysis is homes, schools, workplaces, and other complex naturalistic settings. The concept emphasizes intervention on a broad scale and looks beyond the immediate environment to classroom, group, and systems-level contingencies that may impact behavior. PBS exemplifies an equal focus on preventive strategies and intervention strategies for problem behavior reduction (Dunlap et al., 2008). In addition, PBS proactively promotes replacement behaviors and submits that behavior interventions relying on aversive and exclusionary discipline practices and which ignore the expansion of positive behavior are usually ineffective and possibly inhumane (Solomon, Klein, Hintze, Cressey, & Peller, 2012).

Within the science of behavior, PBS assumes its own identity, an identity strongly influenced by the realities of conducting research and intervention in natural community settings—realities that necessitate changes in assessment methods, intervention strategies, and the definition of what constitutes a successful outcome (Carr et al., 2002).

PBS emerged when it did because of two challenges facing the field of behavior support. The first was how to provide support to individuals with intensive support needs without using painful and aversive stimuli. The use of electric shock, spanking, noxious sprays, and similar "consequences" for problem behavior could be defended from an analysis of animal research, but these approaches offended the values of the field and were found to too often carry deleterious side effects for both those receiving the intervention and those implementing the intervention. PBS was challenged first to become a technology that could reduce dangerous and damaging behaviors without requiring the delivery of pain.

The second, and synonymous, challenge to the field was to move from "management" of behavior to "support" of behavior. The recognition was that behavior support must move beyond a research endeavor where change across time segments was documented to an applied technology to where support resulted in change that included improved quality of life and improved positive behavior as well as reduction in problem behavior. This second challenge was more complex, more important, and more instrumental than many understood at the time. The call was to make the technology of behavioral intervention responsive to the values of individuals and their families/advocates. When the disability field made behavioral intervention a "values-first" technology, it launched positive behavior support. In many ways, the last 25 years have been spent building, validating, and documenting the practices needed to meet this challenge.

Defining Characteristics of PBS

From its origin, PBS focused on intervention strategies feasible for community, home, and school settings to address problem behavior and improve quality of life, without using aversive or stigmatizing procedures. PBS is characterized by its proactive approach, and emphasis on teaching new skills, and manipulating the antecedent conditions in a setting as much as on the consequences for behavior (Dunlap et al., 2010).

The first formal iteration of PBS involved persons with severe disabilities who had previously been subjected to official and unofficial mistreatment through aversive interventions (LaVigna &

Donnellan, 1986; Meyer & Evans, 1989; Singer & Wang, 2009). The technology was comprised of functional behavior analysis, antecedent manipulations based on assessment, teaching strategies, and the altering of contingent reinforcement to emphasize the positive and reduce or remove the aversive. Built upon previous ABA research, these foundational components were assembled purposefully to emphasize ecological and social validity, quality of life, and a pervasive respect for dignity (Dunlap et al., 2009). Previously denied the common benefits and pleasures of community life, the recipients of the original PBS technology were the beneficiaries of a commitment to improve the quality of life of vulnerable persons (Singer & Wang, 2009).

As previously noted, PBS is proactive in nature. It is emblematic of a prevention paradigm. Key messages from the science of behavior denote that much of human behavior is learned and affected by environmental factors and, therefore, can be changed as an environment is changed. The more we understand the multiple facets of a problem behavior, the better positioned we are to teach prosocial, functionally equivalent replacement behaviors. The technology of PBS is grounded in the science of human behavior and, although various techniques are applied at different levels, the essential elements of behavior are unvarying (Sugai et al., 1999). The technology's practices and procedures represent an attempt to remedy the symbiotic relationship between maladaptive behavior and their inadequate environments for the purpose of preventing recurrent problem behavior.

There are a number of features that are important to consider when defining PBS and appreciating its role in the landscape of behavioral science and practice. Carr et al. (2002) describe PBS as a highly pragmatic, problem-solving approach that is receptive to input from multiple perspectives, with the ultimate standard being that such inputs are subject to empirical accountability and validation, as well that they are aligned with the supreme PBS goals of decreasing problem behavior and increasing quality of life. In defining PBS, there are seven common themes worthy of acknowledgment and encouragement.

Values Driven

PBS is a technology for changing behavior. Unlike many behavior change technologies, however, PBS starts with the values of the person receiving support, his or her advocates, and those who will deliver support. The science informs behavior change, but it is ultimately our values that define what is worth changing. The core of the PBS technology is not simply the reduction of problem behavior but the improvement of people's lives (Carr et al., 1999a, 1999b; Koegel, Koegel, & Dunlap, 1996; National Institutes of Health, 1991).

In contrast, PBS includes increasing the likelihood of successful opportunities in education, employment, and the community, as well as improved health and social well-being of the individual and his or her stakeholders. The supports necessary to foster such success and improvement include instructional methodologies for teaching, strengthening, and expanding prosocial behavior repertories. The primary goal of PBS is to help an individual change his or her lifestyle in such a way that all relevant stakeholders (i.e., educators, employers, family, friends, the individual himself or herself) are afforded the opportunity to perceive and enjoy an improved quality of life (Carr et al., 2002).

Within the science of behavior, PBS represents a position from the high moral ground—a position that challenges the design of effective technology. PBS balances scientific technology with person-centered values by evaluating all strategies with respect to efficacy as well as ability to enhance personal dignity and opportunities for choice (Carr et al., 2002). Support strategies are focused on producing durable, generalized behavior change in order to achieve greater access to community settings, improved social contact, and a wider array of preferred events (Horner et al., 1990). The hypothesis of the technology is that if an individual's needs are met,

then quality of life will improve and behavior will be reduced or eliminated (Carr et al., 2002).

At the heart of PBS is the focus on defining the technology that affords individuals the opportunity to live a personally satisfying, enviable life. Quality of life (QOL) is a complex concept. Dunlap et al. (2010) identified six domains from the literature including material well-being, health and safety, social well-being, emotional/affective well-being, leisure and recreation, and personal well-being.

Behavior Based

PBS owes more to applied behavior analysis (ABA) than any other conceptual foundation. Behavior is a function of understood principles. Effective support should be guided by practices that are empirically documented to work. Evaluating the antecedent and consequences associated with a behavior has a long been advocated in ABA (Baer, Wolf, & Risley, 1968; Bandura, 1969; Kanfer & Saslow, 1969). PBS is an approach based on valid science. The technology focuses on efficient processes for identifying when problem behaviors are likely to occur and what events are likely to maintain the recurrence (Horner et al., 1990).

Central among the practices used in PBS is the use of functional behavioral assessment (FBA). Functional behavioral assessment is the process of identifying variables that reliably predict and maintain problem behaviors (Horner, 1999). FBA serves to definitively identify how inappropriate, challenging, or problem behaviors function for the person exhibiting them. The underlying assumption is that every behavior serves a purpose. Understanding the functional relation between problem behavior and consequences (i.e., purpose, motivation, intent) does not serve to rationalize the inappropriate behavior but does serve to make it understandable (Singer & Wang, 2009).

Instead of interpreting problem behavior as the product of indiscernible, active forces within the individual, PBS supports that behavior is the product of challenging social situations for which the problem behavior is the individual's attempt at a solution. Revealed is a focus on environmental variables including antecedents (i.e., events that trigger the behavior), setting events (i.e., the larger context that influences the likelihood that problem behavior will be triggered), and consequences (i.e., the purpose, intent, function, motivation; Horner & Carr, 1997). Functional behavioral assessment serves the intention to identify the very conditions in which problem behavior is likely to occur so that environments can be modified and rearranged to reduce recurrences of problem behavior and foster the teaching and encouragement of replacement behaviors (Sugai et al., 1999).

The role of functional behavioral assessment, however, is only the start of the contribution that behavior analysis has made to PBS; the conceptual understanding of human behavior provided through behavior analysis permeates PBS. The technology emphasizes establishing a direct connection between the results of an FBA and the actual intervention program developed.

Comprehensive in Scope

Because the values guiding PBS require attention to both prosocial replacement behaviors and problem behaviors, behavior throughout an entire day, and behavior across many days, it is highly unlikely that a single intervention strategy will be adequate. From conception, PBS was challenged to define a support technology for not simply solving the problems of a dramatic moment but preventing that moment, teaching skills to redirect that moment, defusing the moment, preventing the moment from repeating, and most importantly defining the data system that would make all this understandable to people who both deeply cared about the valued outcomes and care enough to be technically competent. To meet this challenge, PBS became much more complete as a support technology. The result was the emergence of technology of support incorporating multiple elements and multiple outcomes.

The daily application of positive behavior support requires the application of multiple

procedures. Therefore, interventions must be comprehensive in scope, format, and function. Because behavior support is about lifestyle change as well as behavior change, there must be an expansion in the structure and scope of interventions. A focus on person-centered values necessitates complex, multicomponent interventions designed to improve the living options of the individual as well as reduce the occurrence of problem behavior. Specifically, comprehensive interventions aid in increasing positive behavior while simultaneously decreasing undesirable behavior (Horner et al., 1990; Horner & Carr, 1997; Koegel & Koegel, 1988).

The chief objective of a comprehensive intervention is to yield a lasting, general reduction in problem behaviors within a short time frame while improving the individual's quality of life in home, community, educational, or professional settings. Comprehensive interventions are exemplified by five essential elements (Horner, 1999). (1) Comprehensive interventions target all inappropriate or challenging behaviors performed by the individual. A behavior support plan is inefficient and ineffective if it targets some behaviors and ignores others. (2) Comprehensive interventions are powered by a functional behavioral assessment. There is now wide and compelling literature documenting that if behavior support is consistent with functional assessment, the effectiveness of the intervention increases (Carr et al., 1994, 1999a, 1999b). (3) Comprehensive interventions are applied throughout the entire day. (4) Comprehensive interventions combine multiple procedures to target the different problem behaviors, different motivations, different antecedents, and different setting events. The purpose is not to create unintelligible, elaborate, complicated behavior supports but rather to better comprehend how the traditional, single-strategy approach is insufficient. (5) Comprehensive interventions must exemplify a contextual fit. Comprehensive positive behavior support incorporates methodology that is aligned with the values, skills, and resources of the implementers (Horner & Carr, 1997). As well, it must work for all individuals in the context where support occurs. If support benefits the individual with disabilities but inhibits life for other individuals in the environment or impedes the success of implementers due to complex and difficult support plans, then the support will either not be provided at all or will be cast aside as soon as the behavioral crisis is past.

There is no standardized template for designing comprehensive interventions. Functional behavioral assessment provides great insight for developing interventions. However, the assessment results will never detail specific intervention strategies or methodologies. Within PBS, it is likely that numerous intervention combinations could be implemented with acceptability and produce valid results. The goal is to select complementary procedures (i.e., antecedent manipulations, consequence modifications, setting event redesign) that are both aligned with the functional assessment and realistic given the resources of the setting (Albin, Lucyshyn, Horner, & Flannery, 1996).

Educative

When Carr and Durand (1985) defined functional communication training and the design of interventions that competed with problem behavior, there was an immediate recognition that too often behavior support had missed the important role of building adaptive skills. PBS includes teaching adaptive skills, but through the use of FBA, these skills include those positive behaviors that can replace problem behaviors.

Individuals with challenging behaviors sometimes develop maladaptive behaviors; they possess a deficient skill set for coping with their contexts. One of the most significant aspects of PBS is instruction of new skills for navigating current and future environments (Lee, Wood, & Browder, 2015). Within a nonaversive approach to behavior management, great attention is given to directly teaching individuals prosocial, adaptive ways of obtaining the very outcomes that are currently achieved through maladaptive, challenging behavior (Carr, 1988; Evans & Meyer, 1985; LaVigna & Donnellan, 1986).

To teach replacement behaviors, the behavioral function of the challenging behaviors must

first be identified. What is the consequence (i.e., purpose, intent, function, motivation) of the inappropriate behavior? By attending to the function of a challenging behavior, clinicians and practitioners are better able to distinguish deficient behavior repertoires. Carr et al. (1999a) noted that behavior repertoires are deficient to the extent that communication skills, self-management, social skills, and other constructive behaviors are underdeveloped or absent.

A principal objective of PBS is to assist an individual in achieving his or her goals in a socially acceptable manner, thereby removing all relevancy and effectiveness of problem behavior and fundamentally reducing or eliminating problem behavior episodes (Carr et al., 2002). As evidenced through Carr and Durand's (1985) work on functional communication training, the educative component of PBS involves teaching individuals a specific set of replacement behaviors that are (a) socially acceptable, (b) produce the same effect (i.e., obtain desired items/activities or avoid aversive situations) as the problem behavior, and (c) are more efficient than the problem behavior (i.e., requires less time, effort, or repetitions; Carr & Durand, 1985). Focusing on the cultivation and development of replacement behaviors and behavior repertoires is an effective and efficient approach to decreasing challenging behaviors without the use of invasive or overly disruptive interventions (Horner et al., 1990).

Focus on Effective Environmental Design

An unexpected result of PBS development was a recognition that drew directly from ABA: problem behavior is less likely in effective environments. The goal of effective support was not just what to do around an individual in a situation. The goal became to make home, community, educational, or professional settings more behaviorally constructive. Too often clinicians were being asked to develop highly intensive interventions to control behavior that was occurring in a larger context that was inadvertently shaping occurrence of the behavior. PBS grew from an approach to deal with individuals who performed difficult behavior, to incorporate specific settings for larger features of home, school, work, and community settings.

In addition to ABA, PBS draws greatly from the interrelated fields of systems analysis, ecological psychology, environmental psychology, and community psychology. Conceptually, PBS parallels such ecological paradigms in numerous ways: (1) the technology deals with units of analysis larger than the individual and seeks to focus on systemic change; (2) ecological validity is paramount with typical intervention agents (i.e., parents, teachers, job coaches) supporting individuals in typical settings (i.e., home, community, school, workplace) for extended periods of time in all relevant venues; and (3) research is viewed as a collaborative process between researchers, practitioners, and stakeholders (Carr et al., 2002). Essentially, the aforementioned fields converge in PBS with the understanding that because individuals in community settings are interdependent, then significant change must exist in the larger social system and not only in the individual. Conceptually aligned with Bronfenbrenner's (1989) ecological systems theory, PBS technology focuses intervention on the problem context as well as the problem behavior.

A defining characteristic of PBS is that intervention efforts should be focused on fixing deficient environments (i.e., problem contexts), not problem behavior. Durable behavior change requires more than the application of distinct techniques to particular challenges (Carr et al., 2002). An uncooperative or disorganized context will defeat the best technologies and methods every time.

Designing effective environments is synonymous with effortful systems change. Within PBS, it is essential to understand that problem behavior remediation is the outcome of the remediation of deficient contexts. It is worth noting that there are two types of deficiencies: environmental deficiencies and behavior repertoire deficiencies. The latter is detailed in the previous section. Carr et al. (1999a) noted that deficient environments exist to the degree that lack of choice, inadequate

instructional methods, limited access to activities, and unsatisfactory daily routines are present, in addition to a host of other proximal and distal stimuli.

Historically, behavioral theory has incorporated manipulation of ecological and setting events into support methodologies. Drawing from ABA, behavior management has traditionally involved manipulating the variables that reliably predict and maintain problem behavior. Horner and Carr (1997) noted that environmental events such as antecedents (i.e., the cues that trigger the target behavior), consequences (i.e., the events immediately following the targeted behavior), and setting events (i.e., the broad context that influences the likelihood that a specific cue will trigger the target behavior; Bijou & Baer, 1978) are all manipulable.

It follows logically that by analyzing antecedents and setting events, one can reliably predict when behavior is most and least likely (Bijou & Baer, 1961; Thompson & Grabowski, 1972; Carr, 1977). The increased use of functional behavioral assessment within PBS allows for practitioners to modify antecedent events so that items or events in a setting which trigger target behaviors are reduced or removed (Touchette, MacDonald, & Langer, 1985) while simultaneously adding items or events that are likely to prompt the use of the replacement behavior (Horner & Albin, 1988; O'Neill et al., 1997).

For a prosocial, appropriate, functional behavior to thrive, there must be a supportive host environment. By manipulating independent variables such as altering environmental conditions (i.e., antecedents, setting events), there is greater promise for practitioners and stakeholders to see positive, durable behavior change. PBS technology is more than the selection of an intervention. It is representative of behavioral support with a greater focus on comprehensive supports that include teaching of replacement behaviors that make the problem behavior inefficient, manipulation of consequences to ensure appropriate behaviors are more satisfying, and design of effective environments to make problem behaviors irrelevant (Carr et al., 1999a, 1999b).

Accountability

Similar to ABA, PBS is an empirical approach that relies on valid and reliable data to support its practices. Due in large part to its roots in behavior analysis, PBS has always advocated for high accountability. This advocacy is most evident in that PBS technology includes the collection and use of publicly interpretable data as part of individual application (Dunlap et al., 2008).

This attention to accountability is evident in the collection of functional assessment data. Data collected on (a) the context and triggers that covary with a problem behavior, (b) the intensity duration and form of the problem behavior, and (c) the events that follow (and presumably maintain) the problem behavior is extremely valuable. This data allows for the development of hypotheses about when, where, and why the problem behavior occurs, hypotheses that can be used to devise effective and efficient interventions (Horner & Carr, 1997).

Accountability is also exhibited in evaluation systems. Evaluation systems include collection, reporting, and use of data for decision making. Sugai et al. (2010) noted that evaluation systems are a critical component of behavior support. Within the PBS technology, various data sources (i.e., frequency of problem behavior, frequency of replacement behavior) are collected through a range of methods (i.e., archival review, interview, direct observation) and involve multiple stakeholders (i.e., supported individual, family, educators, community members). The data collected are analyzed to determine not only the individual's current level of functioning but also to identify the impact of the intervention on the target behavior as well as improvements in the individual's quality of life. Effective evaluation systems include regular structures for stakeholders to meet, make decisions based upon data, and prioritize implementation items (i.e., action plan; Todd et al., 2011). The incorporation of an evaluation system and regular data collection allows for implementers to make timely programmatic decisions based upon data and adjust support plans accordingly (Sugai et al., 1999).

In addition to documentation of support plan effectiveness, an evaluation system is the more recent and evolving theme of accountability as seen through fidelity of implementation (Newton, Horner, Algozzine, Todd, & Algozzine, 2009). While evaluation systems provide documentation of whether a support plan has been effective, comprehensive evaluation systems allow for assessment of both plan effectiveness (i.e., individual outcomes, progress toward goals) as well as assessment of fidelity of implementation. Conceptualized as the extent to which implementers actualize support plans as designed, fidelity of implementation is an essential element of PBS technology because of its utility in predicting the degree to which an intervention will be successful (Domitrovich et al., 2008; Gresham, 1989). PBS implementers should incorporate fidelity of implementation data as a measure of accountability for the enhancement of supports provided. Advances in computer technology are making assessment of implementation fidelity more feasible and universally possible.

Safety

PBS is a practical technology with intended use by typical intervention agents in typical settings. Be that as it may, there will always be occurrences of problem behavior. Any ethical and practical approach to support should plan for the occurrence of behavior that has been performed in the past. This results in clearly defined plans to protect the safety of all involved. The caveat is that safety procedures are not the plan but are part of the plan.

There is an expressed need in PBS to distinguish emergency procedures from proactive programming. Any effective behavior support technology for individuals with severe problem behavior must include specific response strategies for relevant stakeholders (i.e., practitioners, family). Problem behaviors such as self-injury, aggression, property destruction, defiance, tantrums, and disruption are highly prevalent among children and adults with a variety of developmental disorders (Durand, 2015), and many of these behaviors pose severe social or physical risk to the individual with the disability as well as others within proximity. A support plan which details avoidance or ignoring of undesirable behaviors is insufficient and unethical.

As important as it is to identify specific response strategies, it is equally important to understand that there will be instances where the preferred, most appropriate response is to control the situation as opposed to using an intervention strategy. In dangerous situations, the objective is to provide adequate control in the moment to ensure the safety of the individual and those in close proximity (Horner et al., 1990). Effective use of the PBS technology incorporates detailed procedures for providing support in emergency situations where the supported individual's crisis poses danger to self and others.

Nonetheless, it is imperative that the difference between crisis intervention strategies for infrequent use in emergency situations and ongoing proactive programming designed to produce substantive positive change is unambiguous and explicit. It is crucial that crisis intervention procedures not be allowed to evolve into ongoing restraint or be substituted for effective programming (Horner et al., 1990).

Current Role of PBS

PBS is a multifaceted approach that builds from functional behavioral assessment of problem behavior and generates a support plan that is both comprehensive and educative. The PBS process is characterized by an iterative, data-based process as opposed to a fixed, invariable intervention or program. Within a comparatively brief time span, PBS has amassed a compelling database demonstrating the validity of function-based assessment and comprehensive intervention.

Numerous studies have established that comprehensive, multicomponent PBS interventions are linked to reductions in problem behavior and increases in replacement behaviors. Several analyses have included individuals with developmental

disabilities who have a recorded history of challenging behavior, and a number of these studies have demonstrated positive, sustained, protracted outcomes (e.g., Carr et al., 1999a, 1999b). A case in point is the Feldman, Condillac, Tough, Hunt, and Griffiths (2002) study of multicomponent, assessment-based PBS implemented with 20 participants with developmental disabilities and challenging behaviors (i.e., self-injury, aggression, property destruction).

The Feldman et al. (2002) study was designed to include a diverse set of participants whose life experiences were compromised as a result of serious and chronic behavior problems. The multiyear study included participants ranging in age from 3 to 39 years with various diagnostic characteristics and living in geographically diverse regions of Canada. The study involved collection of baseline data, initial assessment, and implementation of PBS, plus continual support. Prior to PBS implementation, researchers established support teams for each participant comprised of relevant stakeholders (i.e., family, friends, caregiver, employer, educator, participant). Support teams then engaged in the process of person-centered planning (consensus of person's strengths, needs, short- and long-term goals; Kincaid & Fox, 2002) and researchers conducted a functional behavioral assessment (FBA) of the participant's problem behaviors. Resulting FBA data allowed for target behavior to be operationally defined and for the identification of (a) the function of each target behavior, (b) antecedent and setting variables that control each behavior, and (c) appropriate replacement behaviors.

Support teams utilized resulting FBA data to design specific PBS plans for each targeted behavior and relevant setting. PBS plans included explicit instructions replete with definitions of target behaviors as well as precise procedural descriptions for (a) developing replacement behaviors, (b) appropriately reinforcing displays of replacement behaviors, (c) redesigning the antecedent environment to prevent occurrences of problem behavior, (d) appropriately responding to displays of problem behavior, and (e) collecting evaluation data to plan effectiveness and implementation fidelity. The intention of the study was to demonstrate PBS implementation by natural intervention agents; thus researchers never served as primary interventionists in any setting.

Data from the study were indicative, relative to baseline, of decreases in problem behavior, increases in replacement behaviors, improvements to quality of life (QOL) for the vast majority of participants, and up to 3 years post-intervention maintenance. Moreover, data demonstrated that natural intervention agents implemented PBS plans with fidelity. The Feldman et al. (2002) study highlighted that the application of comprehensive PBS, consisting of multicomponent interventions delivered by natural intervention agents across all relevant settings and for long durations to time, is associated with reliable decreases in problem behavior as well as enhancements in QOL.

In another study, Carr et al. (1999b) utilized a comprehensive PBS approach to deal with the problem behaviors of three group-home residents. The experimental, multiple-baseline study included detailed FBAs, verification of hypotheses, and the implementation of a five-component intervention package consisting of building rapport, providing functional communication training, building tolerance for delay of reinforcement, providing choices, and embedding problem behavior stimuli among replacement behavior stimuli (also referred to as behavioral momentum). Results of the study established beneficial outcomes for task engagement and problem behavior and demonstrated maintenance up to 2.5 years. Moreover, the authors illustrated the dynamic qualities of PBS in the needed follow-up assessments and intervention plan modifications as a result of changes in life situations (i.e., residential status, employment status, recreational opportunities) and the passing of time. One significant aspect of the study is the authors' discussion of how dealing with problem behavior across settings, intervention agents, and tasks can beneficially impact a person's quality of life, enabling access to an increased amount of community activities.

There is evidentiary support that a complete and detailed application of essential PBS elements

results in valuable quality of life enhancements for individuals with developmental disabilities (Carr et al., 2002; Dunlap & Carr, 2007). As such, PBS is increasingly expected to be the standard for behavior support within the area of developmental disabilities and is also being extended to many other disciplines (i.e., emotional behavioral disorders, mental health, etc.).

While PBS continues to be expanded to other disciplines and use of the framework's components grows, the units of analysis and focus continue to increase in scope. As such, it is worth discussing PBS as it relates to employment, family support, early-intervention systems, and schoolwide systems.

Employment

Contemporary conversations regarding PBS for adults with developmental disabilities are incomplete without examining the relationship between employment and quality of life (QOL). Dunlap et al. (2010) identified and defined, with specificity, six domains of QOL including material well-being, health and safety, social well-being and interpersonal confidence, emotional/affective well-being, leisure and recreation, and personal well-being. An individual's employment status has the potential to impact QOL domains in a myriad of ways.

Employment increases opportunities for a person to have a social network. Relevant to the QOL domain of social well-being and interpersonal confidence, an employed person has more opportunities for social interaction, thus enhancing capability for engaging in social relationships. The social interactions and social networks that result from employment allow for individuals with developmental disabilities to develop and enhance skills for communication, social interplay, and behavioral adaptation in social contexts. Social networks allow an individual to feel a sense of belonging and to be a part of the workplace culture and community life (Dunlap et al., 2010; Mank, 2007). The alternative to social networks is a diminished potential for friendship and connectedness, along with an increased probability of isolation.

A result of employment is the accumulation of discretionary income. For all persons, with or without developmental disabilities, meaningful choices and improved quality of life are more achievable with discretionary income. More often than not, discretionary income is the result of employment. Discretionary income is relevant to the QOL domain of material well-being. The domain is concerned with access to preferred materials or activities that may enhance a person's pleasure or functional abilities (Dunlap et al., 2010). A person's discretionary income allows them to access the tangible items they value. Additionally, discretionary income enhances a person's access to leisure activities (i.e., hobbies, games, reading) and recreational activities (i.e., sports, travel, arts, and entertainment) that are found to be pleasurable and directly related to the QOL domain of leisure and recreation. As well, a noteworthy association is that of employment and the QOL domain of personal well-being. Employment provides the opportunity to become more self-sufficient, self-determined, and independent. For all persons, employment and the resulting income allow for choice—choice in relationships, belongings, activities, and life decisions.

Research and implementation strategies indicate that individuals with disabilities can be successful in the workplace with appropriate and individualized supports (Mank, 2007). However, gainful employment and the choices of everyday life are often limited. From the early 1980s to the early 2000s, the number of people with developmental disabilities employed in community settings grew from a few thousand to 150,000 (Wehman, Revell, & Brooke, 2003). Still, despite the increase over the years, fewer than 30 % of people with developmental disabilities are employed in community settings and even fewer are working full time. There is a reality of unemployment and underemployment that stands in contrast with the capabilities of people with developmental disabilities and the PBS supports known to be effective.

During the 1990s, research studies demonstrated the effectiveness of natural supports in the workplace for people with developmental disabilities. Studies indicated the capacity for coworkers and supervisors to serve as natural, everyday supports. Other studies identified leadership qualities relative to employers hiring people with developmental disabilities. Taken together, the studies substantiate that barriers to employment are expected to be the result of funding and systems, as opposed to an individual's assumed inability (Mank, 2007).

Other studies of the era exemplified that the training and assistance provided to coworkers and the attention given to placing individuals in jobs that align with their interests, skills, and talents were positively related to a person with disabilities' opportunities to earn higher wages and be more fully integrated within the workplace's social culture (Fillary & Pernice, 2006; Jordan de Urries, Verdugo, Jenaro, Crespo, & Caballo, 2005; Mank, Cioffi, & Yovanoff, 1998, 2000; Nisbet & Callahan, 1987; Storey, 2002). The evolving research on people with developmental disabilities in the workplace continues to show that people with developmental disabilities, regardless of severity, can be productive both independently and collaboratively, be supported in the work environment, earn a significant wage, and be integrated into the environment's social network (Mank, 2007).

Families

For many individuals with developmental disabilities, the most reliable source of support throughout life is the family unit (Kim & Morningstar, 2005). Family support begins at an early age and can profoundly impact a child's development trajectory. The younger a child, the less access they have to the level of social networks adults do. The family unit assumes a greater distinction and importance when children experience disabilities or display problem behaviors that limit the variety and depth of social activities and interactions (Dunlap & Fox, 2009).

Developmental disabilities and challenging behaviors can have a negative impact on the QOL for persons with developmental disabilities and their families. In that regard, research demonstrates that support of the family is very significant when supporting individuals with histories of challenging behaviors (Dunlap & Fox, 2009). Within the PBS framework, the concept of family support aims to involve and empower families by building on family strengths, acquiring and developing new skill repertoires needed to support the child's development, and improving the family's unity and quality of life (Lucyshyn, Dunlap, & Albin, 2002).

Family-centered PBS refers to the application of PBS within the family environment through the partnering of the family with support professionals. In this approach, the family collaborates with professionals on the design and implementation of PBS plans. As well, this approach positions the family as the primary beneficiary and decision maker. This views both the support professional and the family as expert. The support professional is the expert on PBS and technical assistance. The family is the expert on the person being supported, the person's behavior history, the family unit, and all relevant implementation contexts (Dunlap & Fox, 2009).

Recent years have seen significant developments and refinements to the family-centered PBS approach. Research completed with families of children with autism (Dunlap & Fox, 1999) as well as families with young persons with challenging behavior regardless of disability (Fox, Dunlap, & Powell, 2002) has helped to elucidate a process designed to focus on the family as principal intervention agent with the support of professionals well versed in strategies of assessment and intervention such as child development and early-intervention as well as family systems and dynamics.

Complementary to most PBS models, Dunlap and Fox (2009) detailed a family-centered PBS approach that incorporates a five-component intervention package. The approach begins with the establishment of a support team comprised of the support professional(s) and the family. Trust

and vulnerability are integral to this process because a close and harmonious relationship between team members is necessary for success and for the identification of supported person's strengths and needs as well as short- and long-term goals (i.e., person-centered planning).

Once both teams and goals are established, support professionals complete a functional behavioral assessment (FBA) of the supported person's problem behaviors. FBA data allows the team to operationally define the targeted problem behaviors and identify (a) the function of each target behavior from the supported person's perspective and (b) antecedent and setting variables that increase and/or decrease the likelihood of the supported person demonstrating the problem behavior. Support teams then utilize information gathered in the FBA to create PBS plans tailored to the individual. Plans are comprehensive in scope including strategies and techniques focused on prevention of the problem behavior, procedures for teaching replacement behaviors aligned with the function of behavior, and methods for reinforcing desired behavior as well as appropriately responding to problem behavior.

Following plan design, families begin implementation. Families serve as chief interventionists and must live with a plan's procedures and outcomes. As a matter of practice, support professionals never serve as interventionists except when modeling strategies and techniques. Support professionals provide ongoing coaching and support to families so that they may effectively use procedures indicated in the PBS plan. As with all PBS plans, data-based decision making is integrated. Data collected in regard to the supported person's performance (i.e., outcomes) and implementation fidelity are used to evaluate plan effectiveness and to determine any necessary refinements and modifications.

Early Intervention

For families of infants and toddlers with developmental disabilities, prominence is placed on increasing and reinforcing parents' capacity to nurture their children's development. In order to achieve the greatest developmental outcomes possible for infants and toddlers with disabilities, it is imperative to intervene early and provide supplemental experiences to positively influence the early development of the child. As a concept, early intervention is characterized by families and primary caregivers of infants and toddlers with developmental disabilities providing supplemental experiences for the purpose of fostering the development of the child's prosocial behavioral skills (Dunst, 2007).

Within early intervention, four classes of practices exemplify methods which positively influence the learning and development of infants and toddlers with developmental disabilities: (1) response-contingent learning, (2) parent responsiveness to child behavior, (3) everyday natural learning opportunities, and (4) capacity-building help-giving practices (Dunst, 2000).

Response-contingent learning refers to a child's behavior increasing in frequency or strength as a result of having recognized the relationship between what they do and what happens in response (Hulsebus, 1973; Watson, 1966). Whether manufactured or occurring naturally, response-contingent learning opportunities provide the occasion for parents and caregivers to positively reinforce child behavior. Lancioni (1980) detailed that children with disabilities are capable of identifying the relationship between their behavior and the resulting outcomes and that learning opportunities which foster these realizations serve as effective intervention practices. Response-contingent learning promotes the development of child's skill repertoires for achieving desired outcomes.

Directly related to response-contingent learning is the class of practices known as parent responsiveness. Parent responsiveness serves as a contingency to child behavior and is connected to enhanced child development. When interacting with their child, a parent or caregiver's sensitivity and responsiveness to the child's behavior has profound implications on the child's development (Shonkoff & Phillips, 2000). As such, coaching and supporting parents to use a responsive instructional approach with their children is recognized as an early-intervention practice and

has been so for more than 25 years (Affleck, McGrade, McQueeney, & Allen, 1982); Marfo, 1988). Kassow and Dunst (2004) noted that a parent's awareness and mindfulness of the communicative intent of a child's behavior as well as their timeliness and appropriateness of response to behavior positively impacts subsequent behavior. Parent responsiveness fosters a supportive, dependable, nurturing relationship between parent and child of which an outcome is environmental conditions optimal for learning.

The class of natural learning opportunities demonstrates a powerful context for child growth and development and, when taken advantage of, has been shown to positively impact the development of children with disabilities as well as the abilities of parents and caregivers. Routine, customary activities and experiences provide natural learning environments for children with disabilities and their families to develop prosocial behavior and relevant skill repertoires necessary for social well-being (Dunst, Hamby, Trivette, Raab, & Bruder, 2000). However, infants and toddlers with disabilities are typically afforded fewer opportunities to participate in everyday activities and benefit from the resulting natural learning opportunities in comparison to their typically developing counterparts (Dunst, 2007). This discrepancy is lesser related to their specific disabilities and is more related to parental value and appreciation of natural learning opportunities in everyday contexts (Trivette, Dunst, & Hamby, 2004). Studies indicate that parental use of natural learning opportunities results in positive outcomes for parent and child well-being, parent self-efficacy, and parental competence while early-intervention practitioner use of natural learning opportunities had no such effect (Dunst, Bruder, Trivette, & Hamby, 2006; Dunst, Trivette, Hamby, & Bruder, 2006).

Capacity-giving help-giving practices constitute the fourth class of evidence-based, early-intervention practices. Parental appreciation of their own parenting abilities is viewed as determining factor in the types of learning opportunities their children are afforded (Dunst, Trivette, & Hamby, 2006). Capacity-giving help-giving practices serve to increase parent competence and confidence in carrying out their role and responsibilities and increase enjoyment in interacting with their child. Practices involving active listening and empathy, which promote parent decision making and action and which foster collaboration between parent and practitioner, all serve to support parents. Practitioners who employ capacity-giving help-giving practices with families encourage and support parental involvement so as to provide parents with ability to effectively provide their child with beneficial learning opportunities (Dunst, 2007).

As noted in the aforementioned evidence-based practices, early-intervention positions the family as primary interventionist and views parental support and capacity as a determining factor of a child's social–emotional growth and well-being. In that regard, Dunst (2007) outlined three fundamental assumptions which shape the framework of early intervention. First and foremost, it is accepted that the supplemental experiences provided to infants and toddlers with disabilities are designed to promote the child's self-directed learning. The target is the child acquiring prosocial behavior skill repertoires and appropriately using the skills to yield desired outcomes.

As well, since early intervention is comprised of parent-mediated child learning, the second assumption is that early-intervention efforts are effective only to the extent that they increase parental ability and confidence to offer experiences that enhance learning and development. As in most fields, the likelihood for implementation increases when implementers understand the value of their role. When parents and caregivers of infants and toddlers with disabilities identify their importance in determining their child's growth and development, the probability of appropriate supplemental experiences being offered increases.

The third assumption is that early-intervention practitioners serve to support parents and caregivers so that they may, in turn, support the child. Early-intervention practitioners have two main goals: (1) expand parental capacity to acquire skills necessary for child development and (2) refine and strengthen the use of skills parents

already possess. As a matter of practice, direct intervention with a child occurs only to model for parents the use of evidence-based practices and strategies. As a result of the coaching and support early-intervention practitioners provide, parents and caregivers are better poised to offer the supplemental experiences necessary.

In addition to the applications of PBS previously described with individual persons, PBS continues to be expanded to larger systems and units of analysis. One such expansion is early intervention in the area of child-care and early childhood education settings.

There is an increased awareness of the problem behaviors displayed by young children as a result of the disconcerting pervasiveness of such behaviors revealed in contemporary research. Studies approximate that 10–15 % of young children demonstrate significant problem behavior (i.e., prolonged tantrums, physical and verbal aggression, propter destruction, noncompliance, etc.) and that equivalent proportions of children entering kindergarten display such behaviors (Campbell, 1995; West, Denton, & Germino-Hausken, 2000). Other studies, using broader identification criteria, indicated that up to 20 % of preschool children have a quantifiable social–emotional disorder. Prevalence figures are considered to be associated and increased with risk factors such as prenatal exposure to toxic substances, exposure to violence, poverty, and developmental disabilities (Dunlap & Fox, 2009). In addition to prevalence rates is the understanding that problem behaviors do not simply disappear. In many cases, they pose harmful influence to child development and social–emotional growth for years to come (Arnold et al., 1999).

With this heightened awareness of young children's challenging behavior comes a public sense of duty for an enhanced programmatic approach to the social–emotional learning and development of young children and for concentrated endeavors to prevent the development of problem behaviors as well as intervene with present challenging behaviors (US Public Health Service, 2000).

Positive behavior support as it relates to early intervention and early childhood education settings is best viewed through the lens of prevention. Applications of PBS involving larger populations and units of analysis generally involve a multi-tiered model of prevention akin to the public health tiered model comprised of three tiers of populations. The universal tier relates to all members of a population who may possibly contract the problem (i.e., problem behavior) and involves primary prevention strategies focused on reducing the probability of problem occurrences. The second tier is comprised of groups of the population who are considered to be at risk for contracting the problem and incorporates frequent secondary prevention strategies of greater intensity. The third tier is comprised of those members of the population who have already contracted the problem and are in need of intensive, individualized supports (Sugai et al., 1999; Walker et al., 1996). The tiered model of prevention provides an organized system of prevention and intervention matched to level of need.

Fox, Dunlap, Hemmeter, Joseph, and Strain (2003) described the application of a tiered prevention model for early childhood education that aligns with the tiered model derived from public health. The teaching pyramid consists of four levels and represents a continuum of supports and services provided to enhance the social–emotional learning and growth of young children and prevent problem behaviors. The first two levels of the pyramid incorporate primary/universal strategies appropriate for all children. The primary/universal levels of the pyramid pertain to the quality of relationships established between child and parents, educators, and child-care professionals. As well, the primary/universal level focuses on adult–child interactions, guidance, modeling of empathy, assistance with problem solving, and establishment of predictable and stimulating environments.

The third level of the teaching pyramid matches secondary prevention and intervention practices to children who have life experiences and risk factors recognized as increasing the likelihood of social–emotional disorders and enhancing the development of problem behaviors. The top level of the teaching pyramid relates

to the small number of children who presently demonstrate patterns of chronic problem behavior and who necessitate intensive, individualized intervention efforts.

Application of PBS in early childhood education settings typically involves the five-component intervention package previously described: (1) teaming and goal setting, (2) functional behavioral assessment, (3) construction of a behavior support plan based upon data assessment data, (4) implementation, and (5) evaluation and refinement. The literature base chronicling empirical support of PBS in early childhood settings is rapidly increasing. A study by Gettinger and Stoiber (2006) compared classrooms implementing PBS through school-based teams to classrooms not implementing PBS. Those classrooms implementing a PBS process comprised of functional assessments and collaboration between expert and educator, and evidence-based interventions demonstrated higher-quality outcomes when compared to the non-implementing classrooms in regard to frequencies of appropriate and problem behaviors. The study also concluded that children's behavioral improvements were positively correlated with the level of fidelity for PBS implementation.

Schoolwide Positive Behavior Interventions and Supports (SWPBIS)

PBS originated as an intervention for persons with developmental disabilities and challenging behavior. Over time, the essential elements of PBS such as its focus on behavior-based education, environmental redesign, and accountability have expanded to larger units of analysis in more comprehensive and preventive models. School/facility systems are the most recent recipients of the PBS technology.

In today's society, schools and educational facilities have the principal goals of increasing the academic achievement and social–emotional learning of all learners. In order to realize these goals, it is necessary for schools/facilities to focus on the abilities of individual students. However, in order to maximize the potential of all students, it is imperative to adopt a systems perspective. Focusing on the overall culture of a school is vital for establishing an environment conducive to achieving school/facilities' societal goals (Sugai & Horner, 2009).

Schoolwide Positive Behavior Interventions and Supports (SWPBIS) is a framework that has developed in recent years as an alternative to punitive and exclusionary forms of schoolwide discipline (Solomon et al., 2012). SWPBIS uses a systems approach focused on the creation of safe, effective, predictable learning environments for all students through the establishment of a positive social culture and necessary individualized behavior supports (Sugai & Horner, 2009). Use of SWPBIS is growing widely within the USA with more than 30 states reporting the creation of statewide SWPBIS leadership teams and almost 8000 schools reporting adoption (Spaulding, Horner, May, & Vincent, 2008). As well, SWPBIS has been adopted internationally and is widely used in Canada, Norway, Denmark, the Netherlands, Australia, and New Zealand.

Similar to PBS technology for individuals with disabilities that seeks to positively enhance behavioral skill repertoires, SWPBIS aims to create systems that prevent undesirable, problem behaviors while promoting positive, prosocial behaviors. Unlike other efforts aimed at school-/facility-wide reform, SWPBIS is not a packaged curriculum or scripted intervention. SWPBIS is a framework that incorporates evidence-based practices from PBS, practices of universal behavioral prevention, and an educative emphasis on positive, prosocial behaviors (Horner et al., 1990, 2009; Sugai et al., 1999; Walker et al., 1996). SWPBS facilitates the adoption, implementation, and use of evidence-based practices regarding behavior, classroom management, and schoolwide discipline systems.

SWPBIS was designed to strengthen and reinforce teaching and learning environments of the school as well as provide for the social behavior development of all students. Despite the fact that application of SWPBIS varies by school and context, each application is based upon five essential elements. First and foremost is the inclusion of behavioral theory and behavior analysis. This

behavior-based foundation accentuation underscores a person's observable behavior as being indicative of what he has learned and/or how he has been conditioned to conduct himself. As well, SWPBIS accepts that behavior is learned and influenced by environmental factors, thus making it possible to identify when behavior is likely to occur and what alternative behaviors can be taught (Sugai & Horner, 2009).

Second, SWPBIS focuses on prevention. It is this element that is both a hallmark of the approach and a noteworthy distinguisher from PBS technology for individuals. Within SWPBIS, prevention is operationalized through the establishment of a continuum of behavior support and intervention designed to prevent the development of new problem behaviors, the triggering of current problem behavior, or the worsening of existing problem behavior (Sugai & Horner, 2009). To efficiently organize a continuum of support and intervention for a large population such as a school, SWPBIS borrows the three-tier prevention logic from community health and disease prevention in which the primary tier provides universal behavioral support for all students across all settings, the secondary tier provides more intensive behavioral support for students whose behaviors were unresponsive to primary-tier supports, and the tertiary tier provides intensive, individualized supports for students whose behaviors were unresponsive to primary- or secondary-tier supports (Kutash, Duchnowski, & Lynn, 2006; Walker et al., 1996).

Third, SWPBIS is educative and includes both instruction and intervention to enhance students' behavior skill repertoires. At the universal primary-tier level, a small number (3–5) of positively stated core expectations are selected for the entire school. These expectations (i.e., be safe, be respectful, be responsible) serve as explicit, simple, and consistent rules for student behavior. School staff explicitly define each expectation in regard to target behaviors for various school settings (i.e., cafeteria, playground, hallways, classroom). Defined expectations are then taught in the applicable context/environment to students at the beginning of the school year and reviewed at key times throughout the year (Solomon et al., 2012). Education of schoolwide expectations creates a common language for all students, staff, and families. At the secondary tier, instruction is focused on establishing fluency of prosocial behavior skills by incorporating specific, targeted social skill-learning opportunities on a more frequent basis. At the tertiary tier, instruction is intensified and individualized integrating information about antecedent factors that elicit problem behavior, consequences that maintain problem behavior, and function of behavior. This information is utilized to create an individualized behavior support plan focusing on the instruction of more efficient, effective, relevant replacement behaviors (Horner, 1994).

Fourth, evidence-based interventions are part of the SWPBIS infrastructure to increase effectiveness of behavior education and generalization of learned skills. High priority is given to the selection, adoption, and use of evidence-based practices for (a) acknowledging and reinforcing appropriate behavior and (b) establishing consequences for problem behavior (Alberto & Troutman, 2006).

Fifth, a defining feature of SWPBIS is its systems orientation focused on using existing school resources and structures for instilling the SWPBIS approach within the culture and practices of the school (Solomon et al., 2012; Sugai & Horner, 2009). The SWPBIS perspective emphasizes establishing local capacity and expertise for effective and sustained implementation. Majority agreements and commitments among staff and faculty create a common mission and collegial accountability. As well, high standards for implementation readiness, implementation fidelity, and the continuous evaluation of implementation and outcomes contribute to systemic quality improvement (Sugai et al., 2010).

Finally, a hallmark of SWPBIS is the collection and use of data for active decision making (Horner, Sugai, & Todd, 2001). Office discipline referrals (ODRs), suspensions/expulsions, and other records of student behavior problems are considered outcome measures that can be collected, summarized, and used by a SWPBIS leadership team for formative intervention planning (i.e., increase active supervision in the

cafeteria, reteach expected hallway behavior). The Schoolwide Information System (SWIS) is a web-based application commonly used by schools to both collect behavior data and summarize it in detail by student, grade level, time of day, location, and problem behavior. Facilities using the SWIS application are also presented the opportunity to analyze data based upon preferred filters (antecedent factors) to identify behavior motivation or function of behavior (May et al., 2015). In addition, SWPBIS emphasizes the collection, summarization, and analysis of implementation data to identify the extent to which elements and practices are being implemented with fidelity. Together, implementation and outcome data are used by administrators, faculty, and school-based teams to improve the SWPBIS continuum of behavior supports and services (Sugai & Horner, 2009).

As previously stated, SWPBIS serves to strengthen and reinforce teaching and learning environments of the school for optimal academic outcomes as well as provide for the social behavior development of all students through the establishment of a positive school culture. Generally, SWPBIS practices are organized within the aforementioned three-tier model of prevention and support. Each tier has distinctive practices and interventions that characterize SWPBIS.

At universal, primary-tier SWPBIS, interventions are not single, isolated strategies or practices, but rather they are compilations and sets of interventions that enhance the development of a comprehensive and positive social culture for all students, staff, and community members in all areas of the school (Colvin, Kameenui, & Sugai, 1993). SWPBIS interventions are intended to be contextually and culturally relevant. That is, they are created with the needs and characteristics of the school culture in mind for the purposes of successfully influencing and supporting students (Walker et al., 1996).

Commonly, primary-tier SWPBIS embodies six critical characteristics. First, majority agreements among staff and faculty are made to create a common method of discipline that is positive, comprehensive, formal, and continuous. As well, staff and faculty are committed to the use of evidence-based practices for behavior instruction that are both contextually and culturally relevant (Sugai & Horner, 2009). Second, relevant stakeholders of the school (i.e., students, staff, community members) select a small set of positively stated schoolwide expectations that are applicable to all students and staff across all settings and that promote academic and behavioral success (i.e., safe, respectful, responsible or achievement, respect, responsibility). Third, the selected schoolwide expectations are operationally defined in terms of appropriate, expected behaviors and are directly taught to students in a manner akin to academic instruction (i.e., define, model, practice, provide corrective/reinforcing feedback, encourage use for skill fluency). Typically, schools establish a teaching matrix that specifies the appropriate behavior for a location relative to the schooled expectation (Sugai & Horner, 2009).

The fourth characteristic essential to primary-tier SWPBIS is the provision of frequent positive feedback or acknowledgment for displays of expected behavior. It is imperative that students receive such feedback regularly in order for the newly taught behavioral expectations and acquired skills to be strengthened and maintained over time. Fifth, common, formal procedures for responding to problem behavior are necessary for effective error correction. When problem behavior is displayed, a continuum of consequences for responding to rule violations serves to inform and teach distinctions of behaviors that do not meet the schoolwide expectations. Finally, the systems that support SWPBIS practices are supported by ongoing data collection to evaluate the extent to which practices are being implemented with fidelity and the impact implementation is having on student outcomes. In order for SWPBIS to have a positive impact, leadership teams must have access to accurate information, when needed, in an interpretable format for easy data analysis. SWPBIS promotes structures that facilitate data collection routines as well as data analysis routines and procedures (Sugai & Horner, 2009).

As students demonstrate behavior that indicates nonresponsiveness to primary-tier interventions,

secondary-tier supports are accessed. Interventions at this tier are aligned with the schoolwide systems established in the previous tier, and efforts are made to integrate secondary supports within the universal system. At the secondary tier, implementation is guided by an intervention team who coordinate the logistics, provision, and implementation of secondary-tier interventions. The intervention team is responsible for regularly identifying student candidates for secondary-tier supports based upon screening data or other data decision rules (i.e., quantity of office referrals). The secondary-tier interventions and supports that students receive are aligned with the schoolwide, universal system of positive expectations and feedback/acknowledgment systems.

However, the social skill instruction received at this tier is more targeted and based upon the behavior skill deficits demonstrated by the student. This targeted skill instruction incorporates frequent evaluations (i.e., daily, hourly, etc.) of student behavior in relation to a goal for the purpose of providing higher rates of feedback and positive reinforcement to help the student build fluency with positive behavior skills. Additionally, data-based decisions are made on a regular basis to make programmatic modifications for individual students. Such modifications include changing a student's percentage used to indicate success, adjusting the frequency of behavior evaluation, or modifying the reinforcement system to enhance sustainment (Sugai & Horner, 2009). As well, a programmatic adjustment may be transitioning a student to the tertiary tier for more intensive, individualized support.

As student behavior demonstrates unresponsiveness to primary- and secondary-tier interventions implemented with fidelity, it is necessary to consider tertiary-tier supports that are more specialized. Because supports at this tier are more individualized to the student and the specific context of problem behavior(s), tertiary-tier systems are less connected to the schoolwide, universal system.

Definitive characteristics of tertiary-tier interventions are that they are function based and team driven (Crone & Horner, 2003; O'Neill et al., 1997). As a student is identified as an appropriate candidate for tertiary-tier supports, an FBA is conducted to identify the antecedent events that elicit problem behavior, the consequences and environmental outcomes of the problem behavior, and the function/purpose of the problem behavior. A uniquely constructed student support team comprised of relevant stakeholders (i.e., teacher, administrator, family, behavior support specialist) uses the information resulting from the FBA to design an individualized behavior intervention plan comparable to those previously described in applications of the PBS technology for individuals (Sugai & Horner, 2009).

In circumstances with the most severe behavior disorders, tertiary-tier supports provide for the inclusion of community-based supports such as mental health, juvenile justice, child and family welfare, etc. A comprehensive support plan is created accounting for collaboration and interaction among school staff and community resources/agencies to provide supports that are comprehensive and that wrap around the student and the family (Sugai & Horner, 2009).

Future of PBS

With ongoing advances in the conceptual and procedural elements of PBS, we can expect increased diversity in the array of implementation contexts. The field of PBS is witnessing the emergence of successful application in and with school systems (Sugai & Simonsen, 2012) and in school-based bully prevention (Ross & Horner, 2009), families (Binnendyk & Lucyshyn, 2009), early childhood (Fox, Carta, Strain, Dunlap, & Hemmeter, 2010), residential support, communities (Nelson, Jolivette, Leone, & Mathur, 2010), juvenile justice systems (Gagnon & Barber, 2010), and mental health (Bradshaw et al., 2012).

Advances over the next decades will require efforts to collaborate and integrate without losing focus on the core features that define PBS. Currently, PBS advocates and developers are collaborating across disciplines in the effort to improve the quality of life for young persons at risk for or experiencing emotional

and behavioral challenges, as well as the quality of life for all youth. The fields of mental health, juvenile justice, and early intervention are working jointly, sharing unique knowledge and insight, to develop the interconnected systems framework (ISF) to effectively link school mental health (SMH) and positive behavioral interventions and supports (PBIS). In doing so, the strengths of each of the respective processes can be leveraged and result in enhanced teaching and learning environments.

It is worth noting that advancement, collaboration, and integration should not result in the loss of core features. To sustain PBS, it is necessary to emphasize the conceptual logic and core features that are related to behavior change. Sustained development and implementation depend upon PBS being conceptualized as a problem-solving framework that embodies research-based practices. In doing so, the essential elements and critical components of PBS continue to endure while individual practices, applications, populations, and contexts change. As we look to the future, the work is not to develop a new framework. Instead, it is about perfecting and improving the systems, data, and practices we currently used and doing so in alignment with the core features of PBS.

One such feature is the incorporation of environmental redesign to promote positive behavior. It is necessary to examine applications of PBS across individuals and settings to better understand future directions and potential. Applications of PBS across school, home, and community settings illustrate the ability to adapt to context. Future research directions include identifying the features of effective environments. For families and caregivers, how can the field help in the effort to avoid not just the development of self-injurious behavior but also the emergence of depression, defiance, and social withdrawal? For community mental health agencies, how can PBS aid in the promotion of mental health and well-being? As implementation is scaled up in schools and facilities, how can we create systems that simultaneously make more effective learning environments and create settings where bullying, harassment, and intimidation are not supported?

As the field continues expand, use of data will be essential. Data not only guides the clinical implementation but also guides the science. More than ever before, we now have the ability to provide policy makers, clinicians, advocates, and individuals with problem behavior with useful data. A danger is that we now have access to more data than we know how to use. We anticipate that improved data sources (e.g., school information systems) will need to be linked to better training on how to use data for effective decision making. Preliminary evidence suggests that, with a modest investment in training, school teams can become much more effective in using data to identify problems, build solutions, and achieve valued outcomes (Newton, Horner, Algozzine, Todd & Algozzine, 2012).

There remains much we do not know about human behavior and about how to both avoid the development of dangerous behavior and facilitate reduction when such behaviors are present. The need for research on basic principles of behavior remains paramount. PBS implementation has resulted in improved quality of life outcomes for many individuals. Despite improved quality of life being championed as the intended, principal outcome for many years (Carr et al., 2002), it continues to be a challenge. More information is needed profiling individuals with challenging behavior living quality lives based on their own interests, talents, and personalities. Such information serves to illustrate how the critical components of PBS can be successfully applied across lifestyles.

As PBS research and implementation grows, so does its status. The field of PBS has transitioned from being a type or variety of behavior management to becoming a widely accepted science applied across a broad spectrum of social systems. In light of such growth and expansion, it is important to stay mindful that public policy has direct implications for sustainability. Proposed federal legislation in the USA includes PBS by name and language specific to the field. As such proposals become law, we will enter into a new era in which PBS is no longer an evidence- and research-based concept but the de facto standard in social service systems such as public education.

Thus, it is imperative that leaders, lawmakers, those in power, and those responsible for states, cities, municipalities, schools, and facilities should be knowledgeable about PBS.

The field of PBS has an evidenced history and an unlimited future. It now represents more than a technology to change problem behavior. It is the technology for building quality of life throughout our society.

References

Affleck, G., McGrade, B. J., McQueeney, M., & Allen, D. (1982). Promise of relationship focused early intervention in developmental disabilities. *Journal of Special Education, 16*, 413–430.

Alberto, P. A., & Troutman, A. C. (2006). *Applied behavior analysis for teachers* (7th ed.). Upper Saddle River, NJ: Pearson.

Albin, R. W., Lucyshyn, J. M., Horner, R. H., & Flannery, K. B. (1996). Contextual fit or behavioral support plans: A model for "goodness of fit.". In L. Kern Koegel, R. L. Koegel, & G. Dunlap (Eds.), *Positive behavior support: Including people with difficult behavior in the community* (pp. 81–98). Baltimore, MD: Paul H. Brookes Publishing Co.

Arnold, D.H., Ortiz, C., Curry, J.C., Stowe, R.M., Goldstein, N.E., Fisher, P.H., Zeljo, A., & Yershova, K. (1999). Promoting academic success and preventing disruptive behavior disorders through community partnership. *Journal of Community Psychology, 27*, 589–598.

Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis, 1*, 91–97.

Baer, D. M., Wolf, M. M., & Risley, T. R. (1987). Some still current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis, 20*, 313–327.

Bandura, A. (1969). *Principles of behavior modification*. New York, NY: Holt, Rinehart & Winston.

Bijou, S., & Baer, D. M. (1961). *Child development: Vol. 1. A systematic and empirical theory*. New York, NY: Appleton.

Bijou, S. W., & Baer, D. M. (1978). *Behavior analysis of child development*. Englewood Cliffs, NJ: Prentice-Hall.

Binnendyk, L., & Lucyshyn, J. (2009). A family-centered positive behavior support approach to the amelioration of food refusal behavior. *Journal of Positive Behavior Interventions, 11*(1), 47–62.

Blatt, B., & Kaplan, F. (1966). *Christmas in purgatory*. Allen & Bacon.

Bradshaw, C.P., Pas, E.T., Bloom, J., Barrett, S., Hershfeldt, P., Alexander, A., …, Leaf, P. (2012). A state-wide collaboration to promote safe and supportive schools: The PBIS Maryland Initiative. *Administration and Policy in Mental Health and Mental Health Services Research, 39(4)*, 225–237. doi:10.1007/s10488-011-0384-6

Bronfenbrenner, U. (1989). Ecological systems theory. In R. Vista (Ed.), *Annals of child development* (Vol. 6, pp. 187–249). Greenwich, CT: JAI Press.

Brown, R. I., MacAdam-Crisp, J., Wang, M., & Iarocci, G. (2006). Family quality of life when there is a child with a developmental disability. *Journal of Policy and Practice in Intellectual Disabilities, 3*(4), 238–245.

Butterfield, F. (1985, November 19). School's use of physical punishment and therapy is challenged. *New York Times*, p. A20.

Campbell, S. B. (1995). Behavior problems in preschool children: A review of recent research. *Journal of Child Psychology and Psychiatry, 36*, 113–149.

Carr, E. G. (1977). The motivation of self-injurious behavior: A review of some hypotheses. *Psychological Bulletin, 84*, 800–816.

Carr, E. G. (1988). Functional equivalence as a mechanism of response generalization. In R. H. Horner, G. Dunlap, & R. L. Koegel (Eds.), *Generalization and maintenance: Lifestyle changes in applied settings* (pp. 194–219). Baltimore, MD: Paul H. Brookes Publishing Co.

Carr, E. G. (1997). The evolution of applied behavior analysis into positive behavior support. *Journal of the Association for Persons with Severe Handicaps, 22*, 208–209.

Carr, E. G., Dunlap, G., Horner, R. H., Koegel, R. L., Turnbull, A. P., Sailor, W., …, Fox, L. (2002). Positive behavior support: Evolution of an applied science. *Journal of Positive Behavior Interventions, 4*, 14–16.

Carr, E. G., & Durand, V. M. (1985). Reducing behavior problems through functional communication training. *Journal of Applied Behavior Analysis, 18*(2), 111–126.

Carr, E.G., Honer, R.H., Turnbull, A.P., Marquis, J.G., McLaughlin, D.M., McAtee, M.L., Smith, C.E., Ryan, K.A., Ruef, M.B., & Doolabh, A. (1999). *Positive behavior support for people with developmental disabilities: A research synthesis*. Washington, DC: American Association on Mental Retardation.

Carr, E.G., Levin, L., McConnachie, G., Carlson, J.I., Kemp, D.C., Smith, C.E., & McLaughlin, D.M. (1999). Comprehensive multisituational intervention for problem behavior in the community: Long term maintenance and social validation. *Journal of Positive Behavior Interventions, 1*, 5–25.

Carr, E. G., Levin, L., McConnachie, G., Carlson, J. I., Kemp, D. C., & Smtih, C. E. (1994). *Communication-based intervention for problem behavior: A user's guide for producing positive change*. Baltimore, MD: Brookes.

Cole, D. A., & Meyer, L. H. (1989). Impact of needs and resources on family plans to seek out-of-home placement. *American Journal on Mental Retardation, 93, 380–387*.

Colvin, G., Kameenui, E. J., & Sugai, G. (1993). School-wide and classroom management: Reconceptualizing the integration and management of students with

behavior problems in general education. *Education and Treatment of Children, 16*, 361–381.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). Upper Saddle River, NJ: Pearson.

Crone, D. A., & Horner, R. H. (2003). *Building positive behavior support systems in schools: Functional behavioral assessment*. New York, NY: Guilford Press.

Domitrovich, C. E., Bradshaw, C. P., Poduska, J. M., Hoagwood, K., Buckley, J. A., Olin, S., … Ialongo, N. S. (2008). Maximizing the implementation quality of evidence based preventive intervention in schools: A conceptual framework. *Advances in School Mental Health Promotion, 1,* 6–28.

Dubill, R. A. (Ed.). (1982, November). Oklahoma shame [Special report]. *Gannett News Service*.

Dunlap, G., & Carr, E. G. (2007). Positive behavior support and developmental disabilities: A Summary and analysis of research. In S. L. Odom, R. H. Horner, M. Snell, & J. Blacher (Eds.), *Handbook of developmental disabilities* (pp. 469–482). New York, NY: Guilford.

Dunlap, G., Carr, E. G., Horner, R. H., Koegel, R. L., Sailor, W., Clarke, S., …, Fox, L. (2010). A descriptive multi-year examination of positive behavior support. *Behavioral Disorders, 35,* 259–293.

Dunlap, G., Carr, E. G., Horner, R. H., Zarcone, J. R., & Schwartz, I. (2008). Positive behavior support and applied behavior analysis: A familial alliance. *Behavior Modification, 32*, 682–698.

Dunlap, G., & Fox, L. (1999). A demonstration of behavioral support for young children with autism. *Journal of Positive Behavior Interventions, 1*(2), 77–87.

Dunlap, G., & Fox, L. (2009). Positive behavior support and early intervention. In W. Sailor, G. Dunlap, G. Sugai, & R. Horner (Eds.), *Handbook of Positive Behavior Support* (pp. 17–46). New York, NY: Springer.

Dunlap, G., Sailor, W., Horner, R., & Sugai, G. (2009). Overview and history of positive behavior support. In W. Sailor, G. Dunlap, G. Sugai, & R. Horner (Eds.), *Handbook of Positive Behavior Support* (pp. 3–16). New York, NY: Springer.

Dunst, C. J. (2000). Revisiting "Rethinking early intervention". *Topics in Early Childhood Special Education, 20*, 95–104.

Dunst, C. J. (2007). Early intervention for infants and toddlers with developmental disabilities. In S. L. Odom, R. H. Horner, M. E. Snell, & J. Blacher (Eds.), *Handbook of Developmental Disabilities* (pp. 161–180). New York, NY: The Guilford Press.

Dunst, C. J., Bruder, M. B., Trivette, C. M., & Hamby, D. W. (2006). Everyday activity settings, natural learning environments, and early intervention practices. *Journal of Policy and Practice in Intellectual Disabilities, 3*, 3–10.

Dunst, C. J., Hamby, D., Trivette, C. M., Raab, M., & Bruder, M. B. (2000). Everyday family and community life and children's naturally occurring learning opportunities. *Journal of Early Intervention, 23*, 151–164.

Dunst, C. J., Trivette, C. M., Hamby, D. W., & Bruder, M. B. (2006). Influences of contrasting natural learning environment experiences on child, parent, and family well-being. *Journal of Developmental and Physical Disabilities, 18*(3), 235–250.

Dunst, C. J., Trivette, C. M., & Hamby, D. W. (2006). *Family support program quality and parent, family and child benefits*. Asheville, NC: Winterberry Press.

Durand, V. M. (2015). Strategies for functional communication training. In F. Brown, J. L. Anderson, & R. L. De Pry (Eds.), *Individual positive behavior supports: A standards based guide to practices in school and community settings* (pp. 385–396). Baltimore, MD: Paul H. Brookes Publishing Co.

Einfeld, S. E., Tonge, B. J., & Rees, V. W. (2001). Longitudinal course of behavioral and emotional problems in Williams syndrome. *American Journal on Mental Retardation, 106*, 73–81.

Emerson, E., Kiernan, C., Alborz, A., Reeves, D., Mason, H., Swarbrick, R., …, Hatton, C. (2001). Predicting the persistence of severe self-injurious behavior. *Research in Developmental Disabilities, 22,* 67–75.

Evans, I. M., & Meyer, L. H. (1985). *An educative approach to behavior problems: A practical decision model for interventions with severely handicapped learners*. Baltimore: Paul. H. Brookes.

Feldman, M. A., Condillac, R. A., Tough, S., Hunt, S., & Griffiths, D. (2002). Effectiveness of community positive behavioral intervention for persons with developmental disabilities and severe problem behavior disorders. *Behavior Therapy, 33*, 377–398.

Fillary, R., & Pernice, R. (2006). Social inclusion in workplaces where people with intellectual disabilities are employed: Implications for supported employment professionals. *International Journal of Rehabilitation Research, 29*(1), 31–36.

Fox, L., Carta, J., Strain, P., Dunlap, G., & Hemmeter, M. L. (2010). Response to intervention and the pyramid model. *Infant and Young Children, 23*(1), 3–13.

Fox, L., Dunlap, G., Hemmeter, M. L., Joseph, G., & Strain, P. (2003). The teaching pyramid: A model for supporting social competence and preventing challenging behavior in young children. *Young Children, 58*, 48–52.

Fox, L., Dunlap, G., & Powell, D. (2002). Young children with challenging behavior issues and considerations for behavior support. *Journal of Positive Behavior Interventions, 4*(4), 208–217.

Freagon, S. (1990). One educator's perspective on the use of punishment or aversives: Advocating for supportive and protective systems. In A. C. Repp & N. N. Singh (Eds.), *Perspectives on the use of nonaversive and aversive interventions for persons with developmental disabilities* (pp. 145–155). Pacific Grove, CA: Brooks/Cole.

Gagnon, J. C., & Barber, B. (2010). Characteristics of and services provided to youth in secure care facilities. *Behavioral Disorders, 16*(1), 7–19.

Gettinger, M., & Stoiber, K. C. (2006). Functional assessment, collaboration, and evidence-based treatment: Analysis of a team approach for addressing challenging behaviors in young children. *Journal of Psychology, 44*, 231–252.

Gresham, F. M. (1989). Assessment of treatment integrity in school consultation and prereferral intervention. *School Psychology Review, 38*(4), 553–560.

Harvey, S. T., Boer, D., Meyer, L. H., & Evans, I. M. (2009). Updating a meta-analysis of intervention research with challenging behavior: Treatment validity and standards of practice. *Journal of Intellectual and Developmental Disability, 34*(1), 67–80.

Hayes, R. P. (1987). Training for work. In D. C. Cohen & A. M. Donellan (Eds.), *Handbook of autism and pervasive developmental disorders* (pp. 360–370). New York, NY: Wiley.

Horner, R. H. (1994). Functional assessment: Contributions and future directions. *Journal of Applied Behavior Analysis, 27*, 401–404.

Horner, R. H. (1999). Positive behavior supports. In M. L. Wehmeyer & J. R. Patton (Eds.), *Mental retardation in the 21st century* (pp. 181–196). Austin, TX: Pro-Ed.

Horner, R. H., & Albin, R. W. (1988, September). *Functional analysis.* Presentation at the Research and Training Center on Community-Referenced, Nonaversive Behavior Management National Conference, Santa Barbara, CA.

Horner, R. H., & Carr, E. G. (1997). Behavioral support for students with severe disabilities: Functional assessment and comprehensive intervention. *Journal of Special Education, 31*, 84–104.

Horner, R. H., Diemer, S. M., & Brazeau, K. C. (1992). Educational support for students with severe problem behaviors in Oregon: A descriptive analysis from the 1987–1988 school year. *Journal of the Association for Persons with Severe Handicaps, 17*(3), 154–169.

Horner, R. H., Dunlap, G., Koegel, R. L., Carr, E. G., Sailor, W., Anderson, J., …, O'Neill, R. (1990). Toward a technology of "nonaversive" behavioral support. *Journal of the Association for Persons with Severe Handicaps, 15,* 125–132.

Horner, R.H., Sugai, G., Smolkowski, K., Eber, L., Nakasato, J., Todd, A.W., & Esperanza, J. (2009). A randomized, wait-list controlled effectiveness trial assessing school wide positive behavior support in elementary schools. *Journal of Positive Behavior Support, 11*(3), 133–144.

Horner, R. H., Sugai, G., & Todd, A. W. (2001). "Data" need not be a four-letter word: Using data to improve schoolwide discipline. *Beyond Behavior, 11*(1), 20–26.

Hulsebus, R. C. (1973). Operant conditioning of infant behavior: A review. *Advances in Child Development and Behavior, 8*, 111–158.

Jordan de Urries, F. B., Verdugo, M. A., Jenaro, C., Crespo, M., & Caballo, C. (2005). Supported employment and job outcomes. Typicalness and other related variables. *Work, 25*(3), 221–229.

Kanfer, F. H., & Saslow, G. (1969). Behavioral diagnosis. In C. M. Franks (Ed.), *Behavior therapy: Appraisal and status* (pp. 417–444). New York, NY: McGraw-Hill.

Kassow, D. Z., & Dunst, C. J. (2004). Relationship between parent contingent responsiveness and attachment outcomes. *Bridges, 2*(6), 1–17.

Kim, K., & Morningstar, M. E. (2005). Transition planning involving culturally and linguistically diverse families. *Career Development for Exceptional Individuals, 28*, 92–103.

Kincaid, D., & Fox, L. (2002). Person-centered planning and positive behavior support. In S. Holburn & P. M. Vietze (Eds.), *Person-centered planning. Research, practice, and future directions* (pp. 29–50). Baltimore, MD: Brookes.

Knitzer, J. (1993). Children's mental health policy. *Challenging the Future: Emotional and Behavioral Disorders, 1*(1), 8–16.

Koegel, R. L., & Covert, A. (1972). The relationship of self-stimulation to learning in autistic children. *Journal of Applied Behavior Analysis, 5*(4), 381–387.

Koegel, R. L., & Koegel, L. K. (1988). Generalized responsivity and pivotal behaviors. In R. H. Horner, G. Dunlap, & R. L. Koegel (Eds.), *Generalization and maintenance: Life-style changes in applied settings* (pp. 41–66). Baltimore: Paul H. Brookes.

Koegel, L. K., Koegel, R. L., & Dunlap, G. (1996). *Positive behavioral support: Including people with difficult behavior in the community*. Baltimore: Paul. H. Brookes.

Kutash, K., Duchnowski, A. J., & Lynn, N. (2006). *School-based mental health: An empirical guide for decision-makers*. Tampa: University of South Florida, Louis de la Parte Florida Mental Health Institute, Department of Child and Family Studies, Research and Training Center for Children's Mental Health.

Lancioni, G. E. (1980). Infant operant conditioning and its implications for early intervention. *Psychological Bulletin, 88*, 516–534.

LaVigna, G. W., & Donnellan, A. M. (1986). *Alternatives to punishment: Nonaversive strategies for solving behavior problems*. New York, NY: Irvington Press.

Lee, A. L., Wood, L., & Browder, D. M. (2015). Systematic Instruction. In J.L. Anderson, R.L. De Pry, & F. Brown (Ed.), *Individual Positive Behavior Supports: A Standards-Based Guide to Practices in School and Community Settings* (pp. 221–236). Baltimore, MD: Paul H. Brookes.

Lehr, D. H., & Brown, F. (Eds.). (1996). *People with developmental disabilities who challenge the system* (pp. 209–240). Baltimore, MD: Brookes.

Linscheid, T. R., Iwata, B. A., Ricketts, R. W., Williams, D. E., & Griffiths, J. C. (1990). Clinical evaluation of the self-injurious behavior inhibiting system (SIBIS). *Journal of Applied Behavior Analysis, 23*, 53–78.

Lowe, K., Allen, D., Jones, E., Brophy, S., Moore, K., & James, W. (2007). Challenging behaviors: Prevalence and topographies. *Journal of Intellectual Disability Research, 51*(8), 625–636.

Lucyshyn, J. M., Dunlap, G., & Albin, R. W. (Eds.). (2002). *Families and positive behavioral support:*

Addressing problem behavior in family contexts. Baltimore, MD: Paul H. Brookes Publishing Co.

Lucyshyn, J. M., Dunlap, G., & Freeman, R. (2015). A Historical Perspective on the Evolution of Positive Behavior Support as Science-based Discipline. In J.L. Anderson, R.L. De Pry, & F. Brown (Ed.) *Individual Positive Behavior Supports: A Standards-Based Guide to Practices in School and Community Settings* (pp. 3–26). Baltimore, MD: Paul H. Brookes.

Malick-Seltzer, M., & Krauss, M. W. (2001). Quality of life of adults with mental retardation/developmental disabilities who live with family. *Mental Retardation and Developmental Disabilities Research Reviews, 7*, 105–114.

Mank, D. (2007). Employment. In S. L. Odom, R. H. Horner, M. E. Snell, & J. Blacher (Eds.), *Handbook of developmental disabilities* (pp. 390–409). New York, NY: The Guilford Press.

Mank, D., Cioffi, A., & Yovanoff, P. (1998). Employment outcomes for people with severe disabilities: Opportunities for improvement. *Mental Retardation, 36*(3), 205–216.

Mank, D., Cioffi, A., & Yovanoff, P. (2000). Direct support in supported employment and its relation to job typicalness, coworker involvement, and employment outcomes. *Mental Retardation, 38*(6), 506–516.

Marfo, K. (Ed.). (1988). *Parent-child interaction and developmental disabilities: Theory, research, and intervention*. New York, NY: Praeger.

May, S., Ard, W., Todd, A. W., Horner, R. H., Glasgow, A., Sugai, G., & Sprague, J. (2015). *School-wide information system*. Eugene, OR: Educational and Community Supports, University of Oregon.

Meyer, L. H., & Evans, I. M. (1989). *Nonaversive interventions for behavior problems: A manual for home and community*. Baltimore, MD: Paul H. Brookes Publishing Co.

Mugno, D., Ruta, L., D'Arrigo, V. G., & Mazzone, L. (2007). Impairment of quality of life in parents of children and adolescents with pervasive developmental disorder. *Health and Quality of Life Outcomes, 5*, 22–30.

National Institutes of Health. (1989). *Treatment of destructive behaviors.* Abstract presented at the National Institutes of Health, Consensus Development Conference, Rockville, MD.

National institutes of Health. (1991). Treatment of destructive behaviors in persons with developmental disabilities. In *Washington, DC: NIH Consensus Development Conference, US Department of Health and Human Services, 476*(515).

Nelson, C. M., Jolivette, K., Leone, P. E., & Mathur, S. R. (2010). Meeting the needs of at risk and adjudicated youth with behavioral challenges: The promise of juvenile justice. *Behavioral Disorders, 36*(1), 70–80.

Newton, J. S., Horner, R. H., Algozzine, R. F., Todd, A. W., & Algozzine, K. M. (2009). Using a problem-solving model to enhance decision making in schools. In W. Sailor, G. Dunlap, G. Sugai, & R. Horner (Eds.), *Handbook of positive behavior support* (pp. 551–580). New York, NY: Springer.

Newton, J. S., Horner, R. H., Algozzine, B., Todd, A. W., & Algozzine, K. (2012). A randomized wait list controlled analysis of the implementation integrity of team initiated problem solving processes. *Journal of School Psychology, 50*(4), 421–441.

Nirje, B. (1994). The principle of normalization and its human management implications. *VRS Journal, 1*, 19–23.

Nisbet, J., & Callahan, M. (1987). Achieving success in integrated workplaces: Critical elements in assisting persons with severe disabilities. In S. J. Taylor, D. Biklen, & J. Knoll (Eds.), *Community integration for people with severe disabilities* (pp. 184–201). New York, NY: Teachers College Press.

O'Neill, R. E., Horner, R. H., Albin, R. W., Sprague, J. R., Storey, K., & Newton, J. S. (1997). *Functional assessment and program development for problem behavior: A practical handbook* (2nd ed.). Pacific Grove, CA: Brooks/Cole.

Odom, S. L., Horner, R. H., Snell, M. E., & Blacher, J. (Eds.). (2007). *Handbook of developmental disabilities*. New York, NY: The Guilford Press.

Reichle, J. (1990). *National working conference on positive approaches to the management of excess behavior: Final report and recommendation*. Minneapolis, MN: Institute on Community Integration, University of Minnesota.

Reichle, J., & Moore, T. (2014). Overview of positive behavioral support. *LEND Brief, 3–10*. Retrieved August 1, 2014, from https://ici.umn.edu/index.php?products/view_all/35.

Repp, A. C., & Singh, N. N. (Eds.). (1990). *Current perspectives in the use of non aversive and aversive interventions with developmentally disabled persons*. Sycamore, IL: Sycamore Press.

Ross, S. W., & Horner, R. H. (2009). Bully prevention in positive behavior support. *Journal of Applied Behavior Analysis, 42*(42), 747–759.

Sailor, W., & Skrtic, T. (1995). American education in the post modern era. In H. Roselli, D. Evans, & J. L. Paul (Eds.), *Integrating school restructuring and special education reform* (pp. 418–432). Ft Worth, TX: Harcourt Brace College.

Shonkoff, J. P., & Phillips, D. A. (Eds.). (2000). *From neurons to neighborhoods: The science of early childhood development*. Washington, DC: National Academic Press.

Singer, G. H. S., Gert, B., & Koegel, R. (1999). A moral framework for analyzing the controversy over aversive behavioral interventions for people with severe mental retardation. *Journal of Positive Behavioral Interventions, 1*, 88–100.

Singer, G. H. S., & Wang, M. (2009). The intellectual roots of positive behavior support and their implications for its development. In W. Sailor, G. Dunlap, G. Sugai, & R. Horner (Eds.), *Handbook of positive behavior support* (pp. 17–46). New York, NY: Springer.

Solomon, B. G., Klein, S. A., Hintze, J. M., Cressey, J. M., & Peller, S. L. (2012). A meta analysis of school-wide positive behavior support: An exploratory study using single-case synthesis. *Psychology in the Schools, 49*(2), 105–121.

Spaulding, S.A., Horner, R.H., May, S.L., & Vincent, C.G. (2008, November). Evaluation brief: Implementation of school-wide PBS across the United States. Retrieved from http://pbis.org/evaluation/evaluation_briefs/default.aspx.

Storey, K. (2002). Strategies for increasing interactions in supported employment settings: An updated review. *Journal of Vocational Rehabilitation, 17*(4), 231–237.

Sugai, G., & Horner, R. H. (2009). Defining and describing schoolwide positive behavior support. In W. Sailor, G. Dunlap, G. Sugai, & R. Horner (Eds.), *Handbook of positive behavior support* (pp. 307–326). New York, NY: Springer.

Sugai, G., Horner, R. H., Algozzine, R., Barrett, S., Lewis, T., Anderson, C., …, Simonsen, B. (2010). *School-wide positive behavior support: Implementers' blueprint and self assessment.* Eugene, OR: University of Oregon. Retrieved from www.pbis.org.

Sugai, G., Horner, R. H., Dunlap, G., Heineman, M., Lewis, T. J., Nelson, C. M., …, Wilcox, B. (1999). *Applying positive behavior support and functional assessment in schools*. Reno, NV: OSEP Center on Positive Behavioral Interventions and Support.

Sugai, G., & Simonsen, B. (2012). Positive behavioral interventions and supports: History, defining features, and misconceptions. Retrieved December 19, 2014, from http://www.pbis.org/common/pbisresources/publications/PBIS_revisted_June19r_2012.pdf.

Thompson, T., & Grabowski, J. (1972). *Behavior modification of the mentally retarded*. New York, NY: Oxford University Press.

Todd, A. W., Horner, R. H., Newton, J. S., Algozzine, R. F., Algozzine, K. M., & Frank, J. L. (2011). Effects of team-initiated problem solving on decision-making by schoolwide behavior support teams. *Journal of Applied School Psychology, 27*(1), 42–59.

Touchette, P. E., MacDonald, R. F., & Langer, S. N. (1985). A scatter plot for identifying/stimulus control of problem behavior. *Journal of Applied Behavior Analysis, 18*, 343–351.

Trivette, C. M., Dunst, C. J., & Hamby, D. (2004). Sources of variation in and consequences of everyday activity settings on child and parent functioning. *Perspectives in Education, 22*(2), 17–35.

U.S. Public Health Service. (2000). *Report of the surgeon general's conference on children's mental health: A national action agenda*. Washington, DC: Department of Health and Human Services.

Walker, H.M., Horner, R.H., Sugai, G., Bullis, M., Sprague, J.R., Bricker, D., & Kaufman, M.J. (1996). Integrated approaches to preventing antisocial behavior patterns among school-age children and youth. *Journal of Emotional and Behavioral Disorders, 4*, 194–209.

Watson, J. S. (1966). The development and generalization of "contingency awareness" in early infancy: Some hypotheses. *Merrill-Palmer Quarterly, 12*, 123–135.

Wehman, P., Revell, W. G., & Brooke, V. (2003). Competitive employment: Has it become the "first choice" yet? *Journal of Disability Policy Studies, 14*(3), 163–173.

Werner, S., Edwards, M., Baum, M., Brown, I., Brown, R. I., & Isaacs, B. J. (2009). Family quality of life among families with a member who has an intellectual disability: An exploratory examination of key domains and dimensions of the revised FQOL survey. *Journal of Intellectual Disability Research, 53*(6), 501–511.

West, J., Denton, K., & Germino-Hausken, E. (2000). *America's Kindergartener: Findings from the early childhood longitudinal study, kindergarten class of 1998 99, fall 1998*. Washington, DC: US Department of Education, National Center for Educational Statistics.

Wolfensberger, W. (1972). *The principal of normalization in human services*. Toronto, ON: National Institute on Mental Retardation.