Chapter 3
Three-Factor Model of Personal Resiliency and Related Interventions

Sandra Prince-Embury

Section I: Three-Factor Model of Personal Resiliency and Related Interventions

This chapter will describe a three-factor model of personal resiliency (Prince-Embury, 2006a, 2006b, 2006c, 2007) that is based on three core developmental systems commonly associated with adaptive functioning. In addition, this chapter will summarize and integrate the developmental theory underlying the three-factor model, present theory, and research evidence supporting the model. This model was developed by Prince-Embury (2006a, 2006b, 2006c, 2007) as a way of simplifying resilience theory for practical application, in conjunction with the development of the Resiliency Scales for Children and Adolescents (RSCA) (Prince-Embury, 2006a, 2006b, 2006c, 2007) as a user friendly tool for tapping the three-factor model.

Broad-Based Resilience Issues

The definition of resilience as a product of complex interactions of personal attributes and environmental circumstances, mediated by internal mechanisms, has presented a challenge to those interested in applying the construct in the past (Luthar, Cicchetti, & Becker, 2000). In an effort to clarify constructs, theorists have distinguished "resilience" from "resiliency" in that the former is defined as interactive and contextual and the latter addresses personal attributes of the individual (Luthar & Zelazo, 2003; Luthar et al., 2000; Masten, 1994). Studies of resilience have been longitudinal, have employed a developmental-psychopathology perspective, and

S. Prince-Embury (✉)
The Resiliency Institute of Allenhurst, LLC., West Allenhurst, NJ, USA
e-mail: Sandraprince-embury@earthlink.net

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have tried to capture contextual aspects of resilience specific to groups and sets of circumstances. Studies assessing personal resiliency, in an effort to be comprehensive, have employed extensive batteries of preexisting tests, along with various criteria of competence, achievement, or successful adaptation. On a practical level, Masten has suggested that there is work to be done to make the application of resiliency constructs more field-friendly (Masten, 2001; Masten & Powell, 2003).

A first step in understanding and applying the construct of resilience is a clear and user friendly definition. That said, a frequent criticism in the field has been that there has not been consensus on a definition of the construct (Kaplan, 2005). Resilience research has identified lengthy lists of protective factors present in the child's family, school, and community as well as in personal characteristics of the child. In addition, an ecological perspective also considers the complex interaction of these factors and their effect on the child.

Given the conceptual complexity of the field, practical application to enhance resilience is similarly complex. For example, selecting what aspects of resilience to enhance, what kind of intervention to use, and how to assess effectiveness of the intervention present multiple challenges. First practitioners must decide whether to focus on the environmental factors (context), personal attributes of the youth (resiliency), or the interaction between the two (ecological process). Interventions designed to effect the interactions that underlie resilience require multiple approaches and specific plans on how to implement them in conjunction with each other. Interventions designed to effect personal attributes should be based on developmental theory and research showing that these attributes are modifiable and associated with successful behavioral outcome.

Three-Factor Theory of Personal Resiliency

The three-factor model of personal resiliency was developed by Prince-Embury (2006a, 2006b, 2006c, 2007) as a way of simplifying resilience theory for practical application. The model is based on three previously identified attributes of personal resiliency reflective of three core developmental systems: Sense of Mastery, Sense of Relatedness, and Emotional Reactivity and the relationship of these factors to one another (Prince-Embury, 2006a, 2006b, 2006c, 2007). The model focuses on the personal experience of the child and not actual ability or performance as assessed by others. Although it recognized that actual ability as assessed by others is important, the three-factor model assumes that the child's experience mediates between external protective factors and positive behavioral outcomes.

It is important to note that the three-factor model focuses on subjective experience which may be modifiable as opposed to personality traits that might be more fixed. Also the model focuses on psychological processes as opposed to more physically and neurologically based processes such as cognitive ability, physical strength, or ability. The developmental research that demonstrates the relevance of the three core constructs to children's subsequent coping and success is discussed below.

Sense of Mastery

One set of core mechanisms that have been consistently identified as important for resiliency in developmental and resilience research are sense of mastery and self-efficacy. White (1959) suggested that children's sense of competence or efficacy provides them with the opportunity to interact with and enjoy cause and affect relationships in the environment. According to White, a sense of competence, mastery, or efficacy is driven by an innate curiosity, which is intrinsically rewarding and is the source of problem-solving skills. Bandura (1977, 1993) suggested that students' self-efficacy beliefs for regulating their own learning and mastering academic activities determine their aspirations, level of motivation, and academic accomplishments. The construct of competence also found its way into what has been termed the third wave of resilience research. This work examined competence as a strategy for preventing or ameliorating behavioral and emotional problems (Masten, Burt, & Coatsworth, 2006; Masten & Coatsworth, 1998). Consistent with this, the Project Competence group (Masten & Obradovic, 2006) focused on competence criteria for positive adaptation in age-salient developmental tasks (Masten & Powell, 2003). Several studies conducted as part of the Rochester Child Resilience Project supported the hypothesis that positive expectation is related to resilience. Positive efficacy expectations in 10- to 12-year-olds predicted better behavioral adaptation and resilience to stress (Cowen, Pryor-Brown, Hightower, & Lotyczewski, 1991). Positive expectations about their future predicted lower anxiety, higher school achievement, and better classroom behavior control (Wyman, Cowen, Work, & Kerley, 1993). Previous research and theory suggest that children and youth who have a greater sense of competence/efficacy may be more likely to succeed in a school environment and less likely to develop pathological symptoms.

The implication of this body of theory and research is that interventions designed to enhance personal resiliency might address a child's sense of mastery, self-efficacy, and competence in a variety of ways such as helping the child's caretakers to have a more resilient mindset (Brooks & Goldstein, 2001) and/or making sure that the child has some success experiences to support more realistic positive expectations (hope). Also important here would be teaching that success is not instantaneous but is achieved through repeated trials and the ability to change one's strategy (adaptability).

Earlier research, theory, and interventions for children dealing with sense of mastery have focused on related constructs such as Optimism (i.e., Seligman's *Optimistic Child*, 1995). Seligman initially identified "learned helplessness" as the process by which failure experiences may lead to expectations of failure and decreased efforts to succeed. Consequently Seligman and others suggested "learned optimism" as a way of increasing expectations that may lead to more efforts and more success experiences (Seligman, Reivich, Jaycox, & Gillham, 1995). The Resilience Program at the University of Pennsylvania grew out of this earlier work employing cognitive behavioral techniques to overcome depression and enhance resiliency in children (Reivich, Gilham, Chaplin, & Seligman, 2005).

Cognitive behavior treatments for depression are based on the belief that depression is based in part on a triad of hopelessness about the future, oneself, and the world in general. Consistent with this assumption, many cognitive behavioral treatments focus on challenging negative assumptions and encouraging more positive reframing of beliefs. This type of intervention is most commonly associated with the treatment of depression. However, implications are that the ability to change ones mindset is associated with reduction of symptoms of depression and prevention of reoccurrence.

Focus on enhancing sense of mastery is not limited to psychological theory or clinical treatment. Another area of mastery intervention is found in the non-clinical arena of "adventure education," a distinct form of education that originated in the 1960s associated with "experiential education." Adventure education programs in general have the potential to support resiliency in young people as many of the experiences offered in these programs mimic the internal and external factors necessary for resilience (Beightol, et al., 2012; Beightol, Jevertson, Gray, Carter, & Gass, 2009; Benard & Marshall, 2001). Neill and Dias (2001) found that young adults who participated in a 22-day Outward Bound program reported increases in psychological resilience compared to a control group. Ewert and Yoshino (2011) found that college students who participated in a short-term adventure-based experience enhanced resilience in the following ways: perseverance, self-awareness, social support, confidence, responsibility to others, and achievement. One example of such an adventure education is described by Whittington, Budbill, and Aspelmeier (2013). These authors studied the experience of girls, ages 10–16 who participated in a Dirt Divas program. Dirt Divas is a mountain bike program designed to support the positive development of adolescent girls including the development of the girls' resiliency. These authors found a small but significant increase in sense of mastery as assessed by the RSCA (Prince-Embury, 2007). Another example of adventure education found to yield positive changes in resiliency is the Chicago Adventure Therapy Program described in an evaluation by Hutson (2012).

It might be hypothesized that adventure education programs enhance resiliency by exposing youth to challenging (difficult), usually outdoor experiences to which they have had limited if any previous experience (novelty). These planned activities are similar to experiences that youth might in the future experience as adversity, situations that are novel for which they have no prior experience, and that are difficult in that the youth may have established no prior skill set. Differences between adventure education and adversity are that the activities are planned as opposed to unplanned and chosen as opposed to forced, and ways of learning the necessary skill sets are built into the experience. Adventure education experiences may enhance resiliency or youth's ability to face future adversity in the following ways. Youth may learn to reconceptualize novel or unexpected experiences as challenges rather than adversities. Youth may learn that not having the skills to deal with a novel situation does not prevent learning these skills from others. In summary, adventure experiences may provide youth the experience of eventually mastering a novel experience for which they had no prior skill set.

Sense of Mastery Enhancing Tools

Sense of Mastery Enhancement for Young Children

For younger children, strength-based interventions may begin by preparing the child to experience a sense of mastery by changing expectations. Brooks and Goldstein (2005) advise parents and teachers to help youth to develop a "resilient mindset." Three examples of preparing children for mastery are presented below.

The power of "*I think I can*." Positive self-expectation may be discussed with children and their caretakers by pointing out that research shows that whether you think you can do something or not makes a big difference in whether you do it. Children's books and stories demonstrating positive expectation in the face of difficulty may be provided.

Using baby steps: Mastery and self-determination may be introduced with the idea of baby steps, or breaking tasks down into smaller steps and tackling one at a time: step 1, step 2, step 3. This concept may best be demonstrated by example provided by the parent or clinician. Sometimes it helps to write the steps down or to remind oneself by saying baby step 1, baby step 2, etc.

Praising yourself: Mastery involves the ability to recognize and reward oneself when something is accomplished. Some children may lose their innate sense of pleasure in competence when they enter into social circumstances where not all of their acts are rewarded by teachers and parents. The ability to reward oneself for accomplishments should be nurtured by asking the children each night before they go to bed to think about and share about things that they did and were proud of that day.

Mining for Mastery and Strength Identification

Children and adolescents who have experienced more failure than success in their lives may have lost the ability to identify their own strengths. For such youth, it is helpful to provide interventions that help them remember and identify positive experiences associated with hidden, forgotten, buried, or uncultivated strengths. For most youth, there is something that they can recall having done well.

Block and Block (1980) originally coined the term "islands of competence" and Brooks and Goldstein (2001, 2008) have recently expanded this concept with numerous clinical examples of identifying islands of competence to enhance resilience in youth. In addition, once areas of strength are identified, preventive intervention may further identify, elaborate, enhance, and generalize these strengths. These interventions can help youth generalize their strengths to other areas where they may not feel as successful. Structured interventions might help youth learn specific skills and how these skills could be employed in a variety of arenas.

Self-Praise and Self-Acknowledgment

As indicated above recognizing mastery experiences is important in developing a Sense of Mastery. Children seem to develop this ability early in life as recognized by White in motive for competence. Over time, the ability to experience competence becomes inextricably linked to acceptance and approval by significant others. In some cases parents are active in acknowledging and praising their children for mastery. In other cases this acknowledgement is not forthcoming or is replaced by censure by busy parents whose attention is captured only by negative behavior. In the latter case children and teens may experience both the lack of praise for mastery experiences and the loss of the ability for self-praise. Behavior therapy with children often focuses on helping parents to accurately identify and reward mastery experiences in their children.

Identifying Strength Distracters for Children Adolescents

Once strengths are identified and understood, the discussion may turn to distracters or reasons why the youth cannot appreciate or expand on a particular strength. Distracters may include many factors such as poverty, limited resources, lack of parental support, or an already internalized expectation that "it is not going to work anyway." Clinical intervention can then focus on identifying the strength distracters that are operating in the youth's life and developing strategies for diffusing them. Cognitive behavioral therapy techniques may be very useful in this regard.

Sense of Relatedness

Reviewing five decades of resilience research in child development, Luthar (2006, p. 780) concluded, "Resilience rests, fundamentally, on relationships." The importance of relationships for human resilience has been noted in every major review of protective factors for resilience (see Masten & Obradovic, 2006). The importance of relationships and relational ability as mediators of resilience has been supported in research by developmental psychopathologists such as Werner and Smith (1982). Throughout their writing, Werner and Smith have stressed the importance of children having relationships with caring adults other than, or in addition to, their parents. Werner and Smith (1982) noted that resilient youth sought support from non-parental adults (especially teachers, ministers, and neighbors) more often than non-resilient youth. These supportive relationships were influential in fostering resilience.

The implication from this body of literature is that social relatedness is important but the mechanism by which this occurs is explained in a variety of ways. Youth may view relationships as providing specific supports in specific situations.

In addition, internal mechanisms that emerge from youth's cumulative experience of previous support may shield youth from negative psychological impact by providing an internalized expectation of support. This expectation might lead to a youth's ability to find and use support when needed. Previous research has indicated that perceived support, as distinguished from actual support, is the dimension of social support that is most strongly related to psychological well-being in adults and children (Barrera, 1986; Cohen & Wills, 1985; Jackson & Warren, 2000; Sarason, Shearon, Pierce, & Sarason, 1987).

Developmental theorists have worked throughout the twentieth century to identify and label internal mechanisms of relatedness. Psychosocial theories of development, such as that of Erik Erikson (1963), identified the first developmental psychosocial process that occurred in infancy through interaction between the child and the primary caregiver as the development of trust versus distrust. The significance of trust was identified by Erikson (1963) as the first stage of social-emotional development, upon which all other social development is built. Erikson defined basic trust as the ability to receive and accept what is given. Another theorist, Bowlby (1969), observing the interaction between the infant and primary caregiver, conceptualized this early social interactive process as the development of attachment, which has implications for the individual's ability to relate to others throughout his or her lifetime. The attachment system was originally described by John Bowlby in three volumes on attachment and loss (1969) and later examined in many studies of attachment in human development (Ainsworth, 1989; Bolby, 1982, 1988; Bretherton & Munholland, 1999; Sroufe, Carlson, Levy, & Egeland, 1999; Thompson, 2000).

Interventions aimed at enhancing a child's sense of relatedness are abundant although not necessarily labeled as resiliency interventions. Developmental theories cited above support the importance of early parenting. Interventions intending to address this core level of establishing basic trust might identify circumstances where early parenting might be lacking and help caretakers to improve their parenting skills. Interventions aimed at increasing a sense of relatedness through ongoing support might focus at the level of the family through family therapy or psychoeducation helping caregivers increase their capacity for and ability to communicate the presence of support for their child. Interventions aimed at increasing sense of relatedness through comfort with others might focus on enhancing the child's social skills and capacity for empathy or understanding the perspective and feelings of others. Interventions aimed at increasing sense of relatedness through tolerance of others might educate that differences are natural and may be resolved through better communications skills.

Interventions Targeting Sense of Relationship

As mentioned previously, there is consensus among developmental theorists on the importance of relationship for resiliency in youth and adults alike. The ability to relate to others and to gain strength and resilience from these relationships is a multi-faceted and complex process.

Perceived Social Support

Developmental theorists have acknowledged the significance of perceived support for resiliency in dealing with adversity. Research has indicated that an individual's perception that social support is available and accessible is the most important dimension of social support. This perception is predictive of psychological well-being and is not directly or strongly linked with enacted social support (see Hogan, Linden, & Najarian, 2002). Thompson, Flood, and Goodvin (2006) suggest that it is sometimes more important to focus on the persons' subjective experience of supportiveness by carefully examining their expectations of support in relation to what they perceive to be provided by those around them. These authors also suggest that (1) troubled individuals may be less capable of viewing others as sources of available support because of their emotional turmoil and (2) individuals in difficulty may be less able to mobilize supportive networks when they are needed. These ideas highlight the need to explore with children and adolescents what their supports are, before a time of crisis, so that the youth can think about it objectively and think of how they might ask for help in different circumstances. Also, family therapy increasing positive communication between parents and their children might facilitate the child's ability to ask for help and the parent's ability to encourage this process.

Developing Possible "What If" Support Networks

With younger children the idea of support networks can be explained as a list of people that you can turn to for help when you need to. The caregivers may initiate a list of people who might provide support when needed. The list can include family members, teachers, friends, neighbors, and church members. Then several types of situations may be discussed. For each situation the children may be asked to identify people who they could ask for help, how they would approach them, and what they would say. With young children, parents should be involved in this process, emphasizing the importance of a child's perception of support networks and parent's support in this process.

Exploring Trust

Developmental theories suggest that the establishment of basic trust begins very early and is built upon throughout development. The implication is that basic trust is established as a core experience and is not easily modified. Enhancing a youth's experience of trust has been the subject of much therapeutic interest beyond the scope of this chapter. Traditional therapy approaches have often focused on providing supportive therapeutic relationships for youth as emotionally corrective experiences. Some clinicians work within the context of family, coaching parents in providing a more nurturing experience for youth within the home (Brooks & Goldstein, 2001). Other programs take a skills enhancement approach which

assumes that increasing a youth's social skills will increase the likelihood of positive relationships with others, which in turn may enhance the youth's overall sense of relatedness. School psychologist, such as Beth Doll et al., (2004), focus on ecological methods of changing classrooms to be more supportive environments.

Enhancing Social Skills and Enhancing Empathy

In recent years much effort has been paid to enhancing social skills in children such as communication, cooperation, assertion, empathy, engagement, and self-control, which may be broken down into teachable skills such as improving eye contact, initiating and maintaining conversations, understanding others' feelings, and promoting empathy, sharing, and maintaining personal space (Alvord, Zucker, & Grados, 2011; de Boo & Prins, 2007). Although not necessarily associated with the enhancement of resilience, the underlying rationale has been that helping children to better understand the perspective of others and the impact of their own social behavior will ultimately improve their ability to relate to others and develop positive relationships with other. The expectation is that this intervention will reduce conflict with others, increase positive engagement at school, and ultimately improve relational expectations and ability. The enhancement of social skills and empathy has been incorporated under the general rubric of social-emotional learning (SEL). Merrill, known for his work in this area, informs us that there are many definitions of SEL but offers the following two definitions by others, "SEL programming builds children's skills to recognize and mange their emotions, appreciate the perspectives of others, establish positive goals, make responsible decisions, and handle interpersonal situations" (Greenberg et al., 2003, p. 46) and "SEL, is a process through which we learn to recognize and manage emotions, care about others, make good decisions, behave ethically and responsibly, develop positive relationships, and avoid negative behaviors" (Zins, Bloodworth, Weissberg, & Walberg, 2004, p. 4). The success of SEL programs in schools has been demonstrated in a metastudy by Wilson, Gottfredson, and Najaka (2001) which noted positive effects such as reductions in delinquency and substance abuse, reduction in school dropout and nonattendance, and increases in both cognitive and behavioral forms of self-control and social competence.

Emotional Reactivity

Developmental research has demonstrated that children's development of pathology in the presence of adversity is related to their emotional reactivity and their inability to regulate this reactivity. Specifically, strong emotional reactivity and related difficulty with regulation of this reactivity have been associated with behavioral maladjustment and vulnerability to pathology. Emotional Reactivity is in part the child's arousability or the threshold of tolerance that exists prior to the occurrence of adverse events or circumstances. Rothbart and Derryberry (1981) have defined

emotional reactivity as the speed and intensity of a child's negative emotional response. Children's reactivity varies in its intensity, sensitivity, specificity, windows of tolerance, and recovery (Siegel, 1999). Conversely, emotional regulation, or the ability to modulate emotional responses, is a significant factor in fostering resilience (Cicchetti, Ganiban, & Barnett, 1991; Cicchetti & Tucker, 1994; Eisenberg, Champion, & Ma, 2004). Regulation and redirection of emotional arousal are necessary for children to function adaptively in emotionally challenging situations (Cicchetti et al., 1991; Thompson, 1990).

Interventions aimed at reducing emotional reactivity have become increasingly abundant in recent years although not necessarily identified as enhancing personal resiliency. The three-factor model of personal resiliency suggests that decreasing emotional reactivity serves to decrease the child's vulnerability to adversity and hence enhancing personal resiliency. Also decreasing emotional reactivity may allow the child to better employ other aspects of personal resiliency such as sense of mastery and sense of relatedness. Interventions aimed at reducing emotional reactivity may focus on decreasing the child's basic sensitivity. One class of interventions may include increasing awareness of targets that may trigger the child's sensitivity. Other types of interventions might aim at reducing the intensity of the sensitivity through medication or relaxation exercises aimed at changing the baseline level of arousability.

Another group of interventions addressing emotional reactivity focus on the child's ability to recover once upset. Children vary in their ability to recover from emotional upset gaged by how long this recovery takes. Some youth once upset seem to get stuck in the negative emotional reactivity while others experience quick recovery. Interventions aimed at increasing recovery skills may be referred to as emotion regulation, self-soothing, self-talk, relaxation, or breathing exercises among other things.

An additional area for intervention is preventing or reducing the impairment in functioning often associated with emotional reactivity. Again youth vary in the extent to which emotional upset impairs their functioning. Some youth can continue to function fairly well even when they are very upset. Other youth become nonfunctional when upset describing themselves as having a brain freeze, in a fog, dazed, or in a blind rage. Youth's adaptive behavior may be interrupted by emotional upset leading to poor judgment due to inability to process information properly, interrupted relationship ability manifested in withdrawal, inappropriate social behavior, or impulsive acting out. Interventions designed to address these impairments may be pharmaceutical in nature or take the form of teaching behavioral management techniques.

Interventions to Reduce Emotional Reactivity

Interventions designed to reduce emotional reactivity should be informed by an understanding of the developmental underpinnings of high reactivity. Developmental researchers have informed us that a predisposition for high emotional reactivity may

be related to temperament and may be exacerbated by many factors including intrauterine contamination, and early traumatic experiences that have been shown to alter the nervous system. Research of various psychiatric disorders suggests a "kindling" effect through which triggering of the nervous system that occurs in the initiation of a symptom event lowers the threshold at which this symptom event may occur in the future. In this respect the negative impact of heightened emotional reactivity may be cumulative. A temperament-based predisposition to high emotional reactivity may be exacerbated by early traumatic events, which may increase the likelihood of a triggered symptom event, which in turn may increase the likelihood of future symptom events. This series of circumstances suggests the value of prevention at any point along the way including prenatal care, parent education, and good public health policy decisions. Once high emotional reactivity is present, intervention may include increased awareness, education, emotion regulation training, and medication.

For youth who have higher-than-average emotional reactivity, preventive intervention may focus initially on intentional management of emotional reactivity. This preventive strategy might start by helping the youth to identify emotional reactivity as a potential source of vulnerability. Some youth may already be aware of this, but others may need time to fully understand the connection. Awareness may be enhanced by breaking emotional reactivity down into the more discrete and observable components of sensitivity, recovery, and impairment. Once these constructs are understood by the youth in terms of his or her experience, strategies for self-monitoring and eventual self-management are possible. Interventions may focus on identifying triggers for emotional reactivity and helping youth quantify and communicate the difficulty they have in various types of situations.

Sensitivity

Interventions for reducing sensitivity may involve introducing the notion that everyone has triggers that upset him or her and that some people are more reactive than others. The youth's reactivity can be compared to others for the purpose of better understanding his or her own sensitivity. The counselor can explain that although emotional reactivity is to some extent automatic, it is possible to manage it by identifying triggers, learning to anticipate them, and learning better strategies for calming down, such as self-relaxation or systematic desensitization.

Work on reducing sensitivity might begin by generating a list of specific circumstances, hot spots, or trigger events that are upsetting to the youth. Such a list may be used to work on anticipating and managing response to triggering events.

Recovery

Recovery time reflects the time that it takes to recover from emotional upset. Recovery time is important because the longer the time to recover, the longer the youth may experience discomfort and the longer the youth is exposed to possible impairment

associated with the emotional reactivity. Questioning about a youth's ability to recover from emotional upset can introduce the notion that recovery from upset is within the control of the upset individual. Techniques for calming down or self-soothing may be introduced such as deep breathing, relaxation exercises, progressive muscle relaxation, guided imagery, self-talk, or a combination of these techniques.

Further inquiry can also uncover self-strategies that the youth employs for self-calming intentionally and unintentionally. These self-calming behaviors may be positive, such as removing himself or herself from the situation or calling a friend. On the other hand, there can be negative coping strategies, such as use of drugs or alcohol, that may further increase the possibility of impairment. The negative impact of using negative strategies should be discussed with the youth and positive self-calming strategies introduced.

Impairment

Emotional Reactivity is known to have a potentially impairing effect on the functioning of children, adolescents, and adults. The impairment may affect any of the developmental systems such as cognitive or executive functioning, behavioral functioning, and relationship functioning. Interventions might seek to help the youth further understand the potentially impairing effect of emotional reactivity, types of impairment that occur, and strategies to ameliorate this impairment. For example, a youth may also be asked to write down where he or she makes the most mistakes, get most confused, and gets into the most trouble and then to describe what is happening in these situations. The youth may discover that a common theme is that he or she cannot think clearly when upset. Positive intervention strategies might be introduced such as delaying decisions or actions while upset and not thinking clearly and waiting until more clear thinking prevails. Pros and cons of various strategies may then be discussed.

Summary of Interventions and the Three-Factor Model

The above description illustrates how the three-factor model of personal resiliency can allow simplification of understanding complex processes by matching specific interventions with different aspects of resiliency in youth functioning. The advantages of simplification and clarification are many. In an environment of economic concern it is important to make sure that the focus of intervention matches the specific need of the group or individual. Individuals defined as at risk may differ in their relative areas of strength versus vulnerability so that one approach fits all may not be the most efficient. Youth who have good relatedness and sense of mastery may need resilience enhancement in the area of emotional reactivity. Conversely, those with low sense of mastery and adequate relatedness and emotional reactivity may need resilience enhancement in sense of mastery primarily. That said, it is important to

remember that resiliency in functioning is complex. Therefore interventions designed to impact one aspect of resiliency may also impact others as these aspects are all interrelated. For this reason it would be helpful to have tools for outcome assessment that track whether the intervention enhanced the area of resiliency for which it was intended as well as unintended benefits. It would be interesting to ascertain whether a decrease in delinquency was associated with decreased emotional reactivity or an increase in sense of mastery. Similarly it would be helpful to determine whether an increase in school engagement was associated with increased sense of mastery or relatedness or both. Understanding these relationships requires assessment tools that identify specific areas of resiliency, relate to specific interventions targeting these areas, and assess these areas in a systematic and consistent manner.

Section II: Resiliency Scales for Children and Adolescents and Construct Validity

Description of the Resiliency Scales for Children and Adolescents

The RSCA (Prince-Embury, 2006a, 2006b, 2006c, 2007) were developed for the purpose of researching and applying the three-factor model of personal resiliency. The RSCA is a self-report instrument designed to tap the three core developmental systems defined above as experienced and expressed by a child or adolescent. The RSCA consist of three global scales designed to reflect the three designated underlying systems: Sense of Mastery, Sense of Relatedness, and Emotional Reactivity. *T* scores on these three global scales comprise a Personal Resilience Profile which graphically displays the child's relative strengths and vulnerabilities. Two composite scores, the Resource Index and the Vulnerability Index, are summary scores that quantify the child's relative strength and vulnerability for further simplification and use in preventive screening. The three global scales comprise ten subscales that can be used to understand the child's specific strengths and vulnerabilities in more depth. All scores are standardized on age- and gender-based normative samples that are stratified by race/ethnicity and parent education level to match the US Census for 2003 (Prince-Embury, 2007, 2008).

The *Sense of Mastery* Scale is a 20-item self-report questionnaire written at a third-grade reading level. Response options are ordered on a five-point Likert scale: 0 (Never), 1 (Rarely), 2 (Sometimes), 3 (Often), and 4 (Almost Always). The *Sense of Mastery* Scale consists of three conceptually related content areas: *optimism* about life and one's own competence; *self-efficacy* associated with developing problem-solving attitudes and strategies; and *adaptability*, being personally receptive to criticism, and learning from one's mistakes. Higher scores on this global scale or subscales suggest higher personal resiliency in this developmental system. Internal consistencies for the Sense of Mastery Scale are good with an alpha of .85 for youth ages 9–11, .89 for youth ages 12–14, and .95 for youth ages 15–18.

Test–retest reliability coefficients were .79 for youth ages 9–14 and .86 for youth ages 15–18 (Prince-Embury, 2007).

The *Sense of Relatedness* Scale is a 24-item self-report questionnaire written at a third-grade reading level. Response options are frequency-based, ordered on a five-point Likert scale: 0 (Never), 1 (Rarely), 2 (Sometimes), 3 (Often), and 4 (Almost Always). Within this scale, a sense of relatedness refers to *comfort* with others, *trust* in others, perceived access to *support* by others when in need, and *tolerance* of differences with others. Higher scores on this global scale or subscales suggest higher personal resiliency in this developmental system. Internal consistency is good to excellent for the Sense of Relatedness Scale: .89 for children ages 9–11, .91 for children ages 12–14, and .95 for youth ages 15–18. Test–retest reliability coefficients were good; .84 for youth ages 9–14 and .86 for youth ages 15–18 (Prince-Embury, 2008).

The *Emotional Reactivity* Scale is a 20-item self-report questionnaire written at the third-grade reading level. Response options are ordered on a five-point Likert scale: 0 (Never), 1 (Rarely), 2 (Sometimes), 3 (Often), and 4 (Almost Always). Unlike the Sense of Mastery and Sense of Relatedness scales, lower scores on the Emotional Reactivity Scale are indicative of low reactivity and high scores suggest higher vulnerability in this developmental area and more likelihood of less personal resiliency. This scale consists of three related content areas: the *Sensitivity* subscale assesses the child's threshold for emotional reaction and the intensity of the reaction, the *Recovery* subscale describes the length of time required for recovering from emotional upset, and the *Impairment* subscale describes the child's experience of disrupted functioning while upset. Internal consistency for the Emotional Reactivity Scale is excellent with alphas of .90 for youth ages 9–11, .91 for youth ages 12–14, and .94 for youth ages 15–18. Test–retest reliability coefficient was .88 for youth ages 9–14 and youth ages 15–18 (Prince-Embury, 2007).

Summary Index Scores

Although based on a three-factor model the RSCA three global scale scores may be condensed into two summary scores for further simplification. The RSCA Summary Index scores combine information into two scores, which may be unfolded to provide more detailed information at the global and subscale levels. The Index scores were developed based on empirical analyses of RSCA Scale score profiles, factor analytic studies, and validity studies (Prince-Embury, 2006a, 2006b, 2006c, 2007; Prince-Embury & Courville, 2008a; 2008b).

Factor analytic studies indicate that although the three RSCA scales represent three distinct factors, two of these factors, Sense of Mastery and Sense of Relatedness, are highly correlated consistent with the assumption that both represent protective factors of resiliency (Prince-Embury & Courville, 2008a). Thus theory and analyses of empirical data suggested the first index score, the *Resource Index*, which is calculated as the standardized average of the Sense of Mastery and Sense of Relatedness Scale scores. This average is an estimate of students' personal strength or resources, weighting *Sense of Mastery* and *Sense of Relatedness* equally.

It must be emphasized that equal weighting of these factors is an estimate for simplification and that more precise weights of these factors in protective significance may differ across groups and/or individuals. Internal consistency for the *Resource Index* was excellent with alpha coefficients of .93 for youth ages 9–11, .94 for youth ages 12–14, and .97 for youth ages 15–18. Test–retest reliability coefficient was .90 for youth ages 9–14 and .85 for youth ages 15–18 (Prince-Embury, 2007). Resilience theory suggests that youth who perceive themselves as having sufficient personal resources will be more resilient and less likely to develop psychopathology as a consequence of adversity than those who experience themselves as having insufficient personal resources.

Developmental theory suggests that an individual's resiliency relates to whether the individual has sufficient resources and whether these resources are sufficient to offset the amount of personal risk experienced by the individual. The *Vulnerability Index* is designed to estimate the discrepancy between an individual's personal risk and perceived available personal resources. The *Vulnerability Index* score is calculated as the standardized difference between the *Emotional Reactivity T* score and the *Resource Index T* score. It quantifies children's personal vulnerability as the relative discrepancy between their combined self-perceived resources (the *Resource Index*) and their fragility as described by emotional reactivity the *Emotional Reactivity Scale* (Prince-Embury, 2007). Internal consistency for the *Vulnerability Index* score is excellent with alpha coefficients of .93 for youth ages 9–11, .94 for youth ages 12–14, and .97 for youth ages 15–18. Test–retest reliability coefficient was .83 for youth ages 9–14 and .93 for youth ages 15–18. Personal vulnerability would be indicated by a high *Vulnerability Index* score which would indicate that students' personal resources were significantly below their level of emotional reactivity.

Psychometric Adequacy of the RSCA

Reliability

Cicchetti (1994) suggests that coefficient alphas at or above .70 are adequate, at or above .80 are good, and at or above .90 are excellent. Alpha coefficients of .90 are thought of as adequate for tracking individual scores over time. Alpha coefficients of .80 or more are considered adequate for tracking group scores over time. Using these criteria, reliability evidence was excellent for the RSCA Index scores, good for the global score, and adequate for most subscales. The RSCA Index and global scale scores show good or excellent internal consistency across age and gender groups and, as expected, greater internal consistency was evidenced with increased age (Prince-Embury, 2007). For children ages 9–11, the *RSCA Index* scores and the *Emotional Reactivity Scale* score meet the criterion of alpha coefficient >.90 for individual-level tracking. The *Sense of Mastery* and *Sense of Relatedness Scale* scores meet the criterion of .alpha coefficient >.80 for group-level tracking. For children ages 12–14, the *RSCA Index* scores and all three global scores meet the criterion for individual-level tracking. Six of the *RSCA* subscales met criterion for

Table 3.1 Alpha coefficients for the RSCA global scales across six countries

Scale	Canada 2009 (543)	Canada 2010 (390)	China (726)	Brazil (1,226)	Lebanon (599)	Nairobi, Kenya (83)	South Africa (487)
Mastery	.90	.92	.95	.83	.78	.70	.74
Relatedness	.92	.93	.94	.90	.86	.74	.83
Emotional Reactivity	.90	.91	.89	.87	.87	.80	.76

group-level tracking. For youth ages 15–18, both Index scores, three global scale scores, and three subscale scores meet the criterion for individual-level tracking. For this age group all scores meet the criterion for group-level tracking. Hence the RSCA demonstrates good internal consistency, supporting the conceptual and theoretical derivation of the scale, subscales, and indices. Cross-cultural studies indicate adequate to excellent internal consistency for the three global RSCA Scale scores (see Table 3.1). The RSCA has been employed previously with youth in Canada, South Africa (Van Wyk, 2011), Kenya (Tignor & Prince-Embury), China (Cui, Teng, Li, & Oei, 2010), Brazil (Jordani, 2008), and Lebanon (Ayyash-Abdo & Sanchez-Ruiz, Unpublished manuscript).

Research and Validity Evidence

Construct Validity

Prince-Embury and Courville (2008a) established construct validity evidence for the three-factor model of personal resiliency as expressed in the RSCA. In summary, although the three RSCA global scales and their respective subscales were designed based on theory and previous research, confirmatory factor analysis provides validity evidence that the ten resiliency subscales represent three factors that are consistent with the three RSCA global scales and the constructs of resiliency that they represent. This finding supports the construct validity of the three-scale and ten-subscale structure of the RSCA thus supported the proposed framework of resiliency as multidimensional and simplified into three global factors. In addition, Prince-Embury and Courville (2008b) using confirmatory factor analysis found that the three-factor model fits for three age groups between 9 and 18. In addition, invariance analysis shows no statistical differences in factor structure between males and females.

Concurrent Validity by Factor of Personal Resiliency

As discussed above the RSCA design assumes that resiliency is multidimensional and may be simplified into three factors, each comprising interrelated constructs.

Table 3.2 Correlations of RSCA Index and global scale scores with self-concept, parent attachment, and emotional intelligence scores

RSCA Index and global scale scores	Piers-Harris self-concept total score (49)	Piers-Harris self-concept behavior adjust (49)	BYI-II self-concept (46)	BYI-II self-concept (200)[a]	IPPA mother attachment (157)[b]	IPPA father attachment (157)[b]	Emotional intelligence scale (SREIT) (157)[b]
Mastery	.60	.70	.74	.80	.48	.29	.54
Relatedness	.55	.61	.70	.70	.50	.33	.50
Emotional Reactivity	−.49	−.43	−.31	−.58	−.27	−.22	−.24
	(9–14)	(15–18)	(9–14)	(15–18)	(15–18)	(15–18)	(15–18)

All correlations were statistically significant at $p < .05$. Again divergent validity is suggested by a weaker and negative correlation with emotional reactivity (−.24)

[a]Standardization sample.

[b]Luthar Bridgeport sample

The three-factor model underlying the RSCA assumes that these dimensions are relevant across circumstances but vary in relative salience depending on the validity question being asked. Therefore, concurrent validity evidence below will be presented with respect to protective factors first; Sense of Mastery and Sense of Relatedness. Secondly validity evidence will be provided pertaining to a personal risk factor, Emotional Reactivity. The three-factor model as expressed in the RSCA assumes that personal resiliency is based in core developmental processes that exist in normative as well as populations exposed to adversity (Masten, 2001). Therefore much of the validity evidence presented below is based on the presence of protective and risk factors in normative samples, as well as in the comparison of normative and clinical samples.

Protective Factors: Self-Concept

Validity evidence for the RSCA as a reflection of protective factors may be explored in the relationship between RSCA scores and measures of self-concept. Previous theorists have suggested that resiliency is associated with positive self-concept or self-esteem (see Rutter, Luthar, and Brooks). Research by Dumont and Provost (1999) and others has previously provided support for this relationship. Prince-Embury (2007) described the relationship between the positive Self-Concept score of the Beck Youth Inventory—Second Edition (BYI-II) and the RSCA protective factor scores for children and adolescents (see Table 3.2). Significant positive correlations were found for both child and adolescent samples, between a positive BYI Self-Concept score and the Sense of Mastery Scale score (.74, .80), and the Sense of Relatedness Scale score (.70, .70), suggesting convergent validity for these scores as reflective of positive self-concept as a protective factor. At the subscale level the RSCA Self-Efficacy subscale was most significantly related to positive self-concept as assessed by the BYI-II for both children (.75) and adolescents (.77) suggesting that perceived self-efficacy is an area of overlap between a positive self-concept and personal resiliency.

These self-concept findings were supported in a separate study using the Piers-Harris Children's Self-Concept Scale, Second Edition (Piers-Harris 2; Piers, 2002) (see Table 3.2 and Prince-Embury, 2007). The RSCA Sense of Mastery and Sense of Relatedness Scale scores were positively correlated with the Piers-Harris 2 Total Score (.60 and .70) and (.55 and .61). The RSCA subscale most strongly correlated with Piers-Harris 2 Total and Domain scores was the Optimism subscale of the Sense of Mastery Scale.

In summary, examination of "self-concept" through correlations of the RSCA global scale scores with other measures suggests convergent validity with Sense of Mastery and Sense of Relatedness with slight differentiation between the two, Sense of Mastery showing a slightly higher correlation with measures of positive self-concept. The relationship between Sense of Mastery and Self-Concept appears to be slightly stronger for adolescents (.80) suggesting a slight increase in this relationship with age. Although direction of causality cannot be determined from correlations, the possibility of enhancing self-concept via increase in Sense of Mastery is suggested. Divergent validity was suggested through negative correlations of Emotional Reactivity with self-concept measures which were also smaller in strength.

Emotional Intelligence

Emotional intelligence defined as awareness of and understanding of emotions has been defined as a protective factor. Total score on the Self-Reported Emotional Intelligence (SREIT; Schutte et al., 1998) was positively correlated with the RSCA Sense of Mastery (.54) and Sense of Relatedness (.50) Scale scores, for 157 adolescents attending a charter school located in a low income area of a New England city (Luthar, 2006, unpublished study).

Protective Factor: Parent Attachment

As discussed above in the introduction section of this chapter, most formulations of resiliency include positive relationships with others as a significant protective factor. Developmental theory had identified quality of parent attachment as a major variable underlying all attachments. Construct validity of the RSCA Sense of Relatedness Scale in particular may be explored in relation to parental attachment as examined by the Inventory of Parent and Peer Attachment (IPPA; Armsten & Greenberg, 1987). One study of 157 adolescents attending high school in a low SES area of Connecticut correlated overall attachment scores for mother and father with RSCA global scale scores (Luthar, 2006) (see Table 3.2). Overall attachment score with mother was significantly and positively correlated with the RSCA Sense of Mastery Scale score (.48) and Sense of Relatedness Scale score (.50). Overall attachment with father was related to a lesser extent to the two RSCA protective scores (.29, and .33). Convergent validity evidence was provided by the positive and

Table 3.3 Correlations of RSCA global scale and Index scores with BYI-II scores of negative affect and behavior for children and adolescents

	BYI-II Anxiety (46) (9–11)	BYI-II Anxiety (200) (15–18)	BYI-II Depress (46) (9–11)	BYI-II Depress (200) (15–18)	BYI-II Anger (46) (9–11)	BYI-II Anger (200) (15–18)	BYI Disruptive Behavior (46) (9–11)	BYI Disruptive Behavior (200) (15–18)
Mastery	−.07	−.51	−.31	−.59	−.32	−.61	−.42	−.53
Relatedness	−.13	−.50	−.38	−.56	−.34	−.57	−.37	−.45
Emotional Reactivity	.43	.65	. 44	.74	.59	.76	.70	.67

significant relationships between RSCA protective scores and mother and father attachment scores. Correlations between Sense of Relatedness scores and attachment scores are not significantly higher than those between Sense of Mastery scores and attachment suggesting that parent attachment contributes to both aspects of personal resiliency. Divergent validity is suggested by the lower negative correlation between parent attachment scores and the Emotional Reactivity Scale score.

Emotional Reactivity and Measures of Negative Affect and Behavior

As stated earlier, the RSCA assumes that personal risk would be reflected by higher Emotional Reactivity Scale scores. Convergent validity for this variable may be assessed by strength of its correlation with measures of negative affect and behavior. Although causality cannot be determined through correlation, it may be inferred that higher emotional reactivity in youth may predispose them to the development of an array of negative emotions and behavior. Strong positive correlations were found between the Emotional Reactivity Scale score and all BYI-II (Beck, Beck, Jolly, & Steer, 2005) scores in non-clinical samples of children and adolescents; (.43, .65) with Anxiety, (.70, .67) with Disruptive Behavior, (.44, .74) with Depression, and (.59, .76) with Anger (see Table 3.3). These strong correlations suggest that higher Emotional Reactivity is associated with more negative affect and behavior for children and adolescents. These relationships appear to be stronger for adolescents than for children suggesting that this relationship may be developmentally cumulative.

It should also be noted that the RSCA Sense of Mastery and Sense of Relatedness scores were negatively correlated with all of the BYI-II scores of negative affect and behavior. These negative correlations are consistent with the notion that personal resources have a buffering effect against negative affect and behavior. This buffering effect is suggested more strongly for adolescents than for children again suggesting that the buffering effect of personal resiliency is developmentally cumulative (see Table 3.3). These findings suggest that interventions that aim at reducing Emotional Reactivity might be slightly more powerful as a first step in preventing negative affect.

Table 3.4 Correlations between RSCA Index and global scale scores CASS:S scores of ADHD, conduct, and cognitive problems in adolescents

	CASS:S conduct problems (89)	CASS:S cognitive problems (89)	CASS:S hyperact (89)	CASS:S ADHD Index (89)
Mastery	−.57	−.45	−.37	−.60
Relatedness	−.51	−.54	−.48	−.64
Emotional Reactivity	.59	.59	.48	.65
	(15–18)	(15–18)	(15–18)	(15–18)

All correlations significant at the $p < .05$

Table 3.5 Correlations of Reynolds Bully/Victimization Scale scores with RSCA global, Index, and subscale scores

	Male ($n = 24$)		Female ($n = 23$)		Total ($n = 47$)	
Scale/subscale/index	Bully	Victim	Bully	Victim	Bully	Victim
Sense of Mastery	−0.21	0.02	−0.77	−0.44	−0.44	−0.16
Optimism	0.08	0.01	−0.58	−0.44	−0.20	−0.16
Self-Efficacy	−0.27	0.03	−0.65	−0.33	−0.41	−0.10
Adaptability	−0.38	−0.28	−0.76	−0.45	−0.52	−0.32
Sense of Relatedness	−0.38	−0.21	−0.63	−0.61	−0.40	−0.29
Trust	−0.26	−0.29	−0.58	−0.62	−0.33	−0.34
Support	−0.09	−0.14	−0.51	−0.61	−0.21	−0.25
Comfort	−0.28	0.03	−0.66	−0.65	−0.45	−0.21
Tolerance	−0.55	−0.27	−0.49	−0.27	−0.36	−0.16
Emotional Reactivity	0.60	0.54	0.26	0.08	0.49	0.42
Sensitivity	0.64	0.50	0.02	−0.15	0.40	0.31
Recovery	0.23	0.34	0.14	−0.06	0.09	0.08
Impairment	0.53	0.48	0.34	0.21	0.51	0.44
Resource Index	−0.32	−0.10	−0.75	−0.57	−0.46	−0.24
Vulnerability Index	0.60	−0.45	0.59	0.38	0.58	0.41
Reynolds BVS						
Mean	51.17	52.21	46.00	47.48	48.64	49.89
SD	8.09	10.79	5.74	5.62	7.44	8.89

Table reprinted from RSCA Technical Manual, Prince-Embury (2007)

Similar results were found in correlational studies of the RSCA with other assessments of problem behaviors such as the Connors Adolescent Symptom Scale: Short Form (CASS; Connors, 1997) (see Prince-Embury, 2007). In a sample of 89 youth ages 15–18, conduct, cognitive, and ADHD problems as assessed by the CASS:S were associated with higher Emotional Reactivity Scale scores (.48–.65) providing additional support for the Emotional Reactivity Scale score as an indicator of personal risk. In addition, lower Sense of Mastery and Relatedness Scale scores were associated with higher CASS scores (−.37 to −.64) indicating that lower personal resiliency is associated with more behavioral difficulties (see Tables 3.4).

Personal Resiliency, Bullying, and Victimization

A study correlating RSCA scores with Bullying and Victimization Scale scores of the *Reynolds Bully Victimization Scales* (Reynolds, 2004) for 47 children ages 9–14 suggested some gender differences between the relationship of these behaviors with vulnerability and resources in children (see Table 3.5 and Prince-Embury, 2007). For boys, Vulnerability and Emotional Reactivity were significantly positively related to self-reported bullying (.60, .60) and victimization (.54, .45). Resource scores were inversely and less significantly related to bullying (−.21 to −.38) and victimization (.02 to −.21) for boys. For girls on the other hand, lower perceived personal Resources were inversely and significantly related to both bullying and victimization. The Resource Index, Sense of Mastery, and Sense of Relatedness Scale scores were negatively correlated with self-reported bullying and victimization in the following manner: (Resource Index, −.75, −.57), (Sense of Mastery, −.77, −.44), (Sense of Relatedness, −.63, −.61). Emotional Reactivity was less related to bullying and victimization for girls (.26, .08). It must be noted that these results are preliminary and should be replicated and expanded upon in larger studies of bullying and victimization. However, if replicated these results would suggest that bullying prevention programs might differ for males and females. Interventions might focus more on managing emotional reactivity for males and on enhancing sense of mastery and relatedness for females.

Personal Resiliency and Risk Behavior

A normative adolescent sample of 100 males and 100 females, ages 15–18, responded to the *Adolescent Risk Behavior Inventory* (ARBS; Prince-Embury, 2006a, 2006b, 2006c) which consists of item clusters tapping self-reported frequency of alcohol and drug abuse, sexual behavior, self-harm ideation, and sensation seeking, as well as completing the RSCA (Prince-Embury, 2006, unpublished study). The sample which comprised the normative adolescent sample for the RSCA was stratified by race/ethnicity and parent education level within gender and age (see Prince-Embury, 2007, for details of the sample). Results were the following. The Emotional Reactivity Scale was positively correlated with self-reported frequency of substance use (.51), sexual behavior (.42), self-harm ideation (.67), and sensation seeking (.33). These findings suggest that higher Emotional Reactivity is associated to higher frequency of risk behaviors in adolescents.

On the other hand, the Sense of Relatedness Scale and Sense of Mastery scores were negatively correlated with frequency of risk behaviors suggestive of a slight buffering effect. Sense of Relatedness was negatively correlated with frequency of substance use (−.40), sexual behavior (−.29), self-harm ideation and behavior (−.53), and sensation seeking (−.24). Sense of Mastery was negatively correlated with frequency of substance use (−.40), sexual behavior (−.23), self-harm ideation and behavior (−.52), and sensation seeking (−.19). Correlations above .30 were

Table 3.6 Correlations of frequency of risk behaviors and negative life outcomes with RSCA Index and global scale scores

	Substance use (200)	Sexual behavior (200)	Self-harm (200)	Sensation seeking (200)	Negative life outcomes (200)
Mastery	−.40	−.23	−.52	−.19	−.47
Relatedness	−.40	−.29	−.53	−.24	−.44
Emotional Reactivity	.51	.42	.67	.33	.49

All correlations significant at $p < .05$

significant at the $p < .001$ level and correlations above .20 were significant at the $p < .05$ level. Overall, these findings suggest that emotional reactivity is more strongly related to risk behavior than protective factors.

Personal Resiliency and Negative Life Events

At the time that the adolescent normative sample for the RSCA was collected, the author also collected data on self-reported number and type of negative events experienced by the youth (*The Negative Life Events Inventory*, Prince-Embury, 2006b). The sample of 200 was split by gender and stratified by race/ethnicity and parent education level to match the US Census. Negative Life Events were divided into negative life events (NLE) that occurred to the teen over which he or she had no control, such as death of a loved one or parental loss of job. Counted separately were negative life outcomes (NLO) over which the youth might have some control, such as dropping out of school or trouble with the law. Correlational analysis shown in Table 3.6 illustrates that the number of negative life outcomes is moderately correlated with RSCA global scale scores particularly the Emotional Reactivity Scale score (.49). Additional analyses suggested a possible gender difference. For males the Emotional Reactivity Scale score was correlated with Negative Life Outcomes (.53) more than were the Sense of Mastery Scale (−.41) or Sense of Relatedness Scale scores (−.35).

For females on the other hand, the Sense of Mastery Scale (−.52) and the Sense of Relatedness Scale (−.53) were slightly more correlated with Negative Life Outcomes in a negative direction than was the Emotional Reactivity Scale score (.46) in a positive direction. These possible gender differences are consistent with those found for the relationship between resiliency and bullying and victimization behavior.

Predictive Validity Evidence Through Criterion Group Differences

The relationship between RSCA scores and the presence or absence of clinical pathology has been supported by analyses of criterion group differences. Prince-Embury (2007) reported significant differences between mean scores of ten clinical

Table 3.7 Mean *T* scores and SD of the child depressive disorder sample and matched control group

	Clinical sample		Matched control					
Scale/subscale	Mean	SD	Mean	SD	Diff	*t*	Significance	*d*[a]
Sense of Mastery	42.2	10.8	52.1	9.3	9.90	3.51	0.0024	0.98
Optimism	6.9	3.3	10.9	2.8	4.00	4.41	0.0003	1.30
Self-Efficacy	8.7	3.6	10.3	3.0	1.60	1.70	0.1055	0.48
Adaptability	8.3	2.7	10.5	3.4	2.20	2.16	0.0435	0.71
Sense of Relatedness	37.9	11.7	52.2	9.9	14.30	4.68	0.0002	1.33
Trust	6.5	3.2	10.7	3.3	4.25	4.82	0.0001	1.29
Support	6.9	3.7	10.6	2.9	3.70	3.40	0.0030	1.13
Comfort	7.8	3.5	10.4	2.6	2.60	3.04	0.0068	0.85
Tolerance	7.3	3.4	10.5	2.7	3.25	3.61	0.0019	1.05
Emotional Reactivity	63.0	7.3	47.7	10.1	−15.30	−6.60	<0.0001	−1.74
Sensitivity	13.5	2.3	9.9	2.4	−3.65	−6.32	<0.0001	−1.55
Recovery	11.9	3.0	9.7	3.2	−2.20	−2.45	0.0239	−0.72
Impairment	13.6	2.4	9.0	3.1	−4.55	−6.86	<0.0001	−1.66
Resource Index	39.0	10.0	52.4	9.6	13.45	4.64	0.0002	1.37
Vulnerability Index	64.5	8.9	47.2	9.9	−17.35	−7.15	<0.0001	−1.84

Note. Clinical sample $n=20$; matched control $n=20$. Using the Bonferroni correction $\alpha^{PC} \geq \alpha^{PW}/k = .05/15 = .0033$, differences between groups are significant where $p \leq .0033$

[a]*d* is the difference of the two test means divided by the square root of the pooled variance computed using Cohen's (1996) Formula 10.4

groups and matched control groups for children and adolescents (Depression Disorder, Anxiety Disorder, Conduct Disorder, ADHD, Bipolar Disorder). Overall, the non-clinical groups scored significantly higher than the clinical groups on self-reported protective factors; the Resource Index score, Sense of Mastery, and Sense of Relatedness scales and subscales. On the other hand, the clinical groups scored significantly higher on the Vulnerability Index, and Emotional Reactivity scale and subscale scores. Effect sizes were large for all differences and in most cases significant. The two tables below demonstrate differences in resiliency factors between youth diagnosed with Depressive Disorder and matched control group.

Table 3.7 reports RSCA scores for a sample of 20 depressed children and a matched sample of children ages 9–14 from the normative sample. The RSCA Index scores and global scale scores for the clinical sample are significantly different from those of the matched control in the direction that would be expected. The depressed group differed from the control group most in Vulnerability (*T*65 versus *T*47), next in higher Emotional Reactivity (*T*63 versus *T*48), and then in Sense of Relatedness (*T*38 versus *T*52) and Sense of Mastery (*T*42 versus *T*52). Examination of subscale scores suggests that the clinically depressed group differs most in self-reported impairment, sensitivity, optimism, and trust. These findings are consistent with the diagnosis of Depressive Disorder.

Table 3.8 reports RSCA scores for a sample of 45 depressed adolescents and a matched sample of youth ages 15–18 from a normative sample. The RSCA Index scores and global scale scores for the clinical sample are significantly different from

Table 3.8 Mean *T* scores and SD of the adolescent depressive disorder sample and matched control group

	Clinical sample		Matched control					
Scale/subscale	Mean	SD	Mean	SD	Diff	*t*	Significance	*d*[a]
Sense of Mastery	35.4	8.2	53.2	8.5	17.82	10.82	<0.0001	2.14
Optimism	5.7	2.7	10.6	2.8	4.93	9.22	<0.0001	1.81
Self-Efficacy	6.1	2.6	11.2	2.4	5.09	9.42	<0.0001	2.00
Adaptability	6.9	2.5	10.6	2.4	3.71	8.41	<0.0001	1.53
Sense of Relatedness	35.7	10.7	51.3	7.9	15.53	8.71	<0.0001	1.66
Trust	5.7	2.9	10.4	2.5	4.71	8.98	<0.0001	1.73
Support	6.5	3.3	10.5	2.5	3.98	6.66	<0.0001	1.38
Comfort	6.6	3.3	9.8	2.7	3.24	5.31	<0.0001	1.07
Tolerance	6.7	3.3	10.6	2.4	3.89	7.15	<0.0001	1.33
Emotional Reactivity	61.6	8.6	47.7	7.2	−13.84	−7.04	<0.0001	−1.75
Sensitivity	13.0	3.3	9.5	2.3	−3.47	−5.23	<0.0001	−1.22
Recovery	12.9	3.2	10.2	2.8	−2.73	−3.88	0.0003	−0.91
Impairment	13.2	2.7	9.2	2.3	−4.00	−6.87	<0.0001	−1.62
Resource Index	34.8	9.5	52.4	8.2	17.62	10.30	<0.0001	2.00
Vulnerability Index	64.9	8.2	47.4	7.2	−17.53	−10.25	<0.0001	−2.27

Note. Clinical sample $n=45$; matched control $n=45$. Using the Bonferroni correction $\alpha^{PC} \geq \alpha^{PW}/k = .05/15 = .0033$, differences between groups are significant where $p \leq .0033$.

[a]*d* is the difference of the two test means divided by the square root of the pooled variance computed using Cohen's (1996) Formula 10.4

those of the matched control in the direction that would be expected. The depressed group differed significantly from the matched control group on all measures with large effect sizes. The biggest differences were on the Vulnerability (*T*65 versus *T*47) and Resource Index (*T*35 versus *T*52) scores, Sense of Mastery Scale (*T*35 versus *T*53), Sense of Relatedness (*T*36 versus *T*51), and Emotional Reactivity Scale score (*T*62 versus *T*48). Similar to the sample of depressed children Vulnerability and Emotional Reactivity were in the high range for the clinical group while Resource, Mastery, and Relatedness scores were in the low range. The matched control groups reported all scores within the average range.

Predicting Clinical Status

Additional analysis suggested that the RSCA Vulnerability Index score was a good predictor of clinical status in adolescents; in some cases predicting better than the presence of psychological symptoms. Discriminant function analysis (Prince-Embury, 2008) was employed to examine the relative predictive validity of the RSCA Index and Scale scores, demographic variables, and the psychological symptoms assessed by the BYI-II (Beck et al., 2005). Variables entered as independent variable included the following: (1) parent level of education, (2) gender, (3) RSCA Scale scores (Sense of Mastery, Sense of Relatedness, and Emotional Reactivity *T* scores), Index scores (Vulnerability and Resource), and the BYI-II scores for

Anxiety, Depression, Anger, and Disruptive Behavior. Groups to be discriminated were coded according to clinical status as 0 (non-clinical) or 1 (clinical). The classification sensitivity was 73 % and specificity was 81 % with the RSCA Vulnerability Index score emerging as the predictor of the most variance followed by the BYI-II Anxiety score accounting for a small part of the remaining unique variance.

In summary, validity evidence relating RSCA scores and psychological symptoms, risk behavior, and clinical pathology included the following. Significant and high correlations were found between Negative Affect and Behavior (BYI-II scores) and all of the RSCA Scale and Index scores. The strongest correlations were between the RSCA Vulnerability Index and Emotional Reactivity scores and the BYI-II scores on Depression, Anger, Disruptive Behavior, Anxiety, as well as self-reported self-harm ideation and behavior and substance abuse. Some gender differences are suggested in aspects of vulnerability/resiliency that are most salient for bully/victimization and negative life outcomes. For males higher Emotional Reactivity appears to be a salient risk factor for bullying behavior and negative life outcomes. For females higher Sense of Relatedness and Sense of Mastery appear to be more salient protective factors against bullying, victimization, and negative life outcomes.

Section III: Clinical Use of the RSCA and Three-Factor Model

Preventive Screening Using the RSCA Personal Resiliency Profile

The three-factor model of personal resiliency and its quantification and standardization using the RSCA allow for preventive screening at the aggregate and individual level. Such preventive screening is facilitated by the use of the Personal Resiliency Profile. The Personal Resiliency Profile, based on RSCA global scale scores (Sense of Mastery, Sense of Relatedness, and Emotional Reactivity), when graphed provides a visual tool for better understanding the relative strengths of multiple aspects of personal resiliency. The profile presents the three global scale scores standardized using the same T metric, which when viewed together, emphasize relative perceived resources and vulnerabilities of children and adolescents. Personal Resiliency Profiles may be examined for individuals or in aggregate. Examples of aggregated Personal Resiliency Profiles will be presented below for clinical and normative samples, along with implications for preventive screening.

Personal Resiliency Profiles: Clinical

Figure 3.1 displays aggregate Resiliency Profiles for six groups of adolescents: non-clinical, Anxiety Disorder, Depression, Conduct Disorder, Bipolar Disorder, and a group that had been in therapy previously (Prince-Embury, 2007). The Personal Resiliency Profile of the non-clinical group approximates a straight line around a *T*-score of 50 which is in the middle of the normative sample.

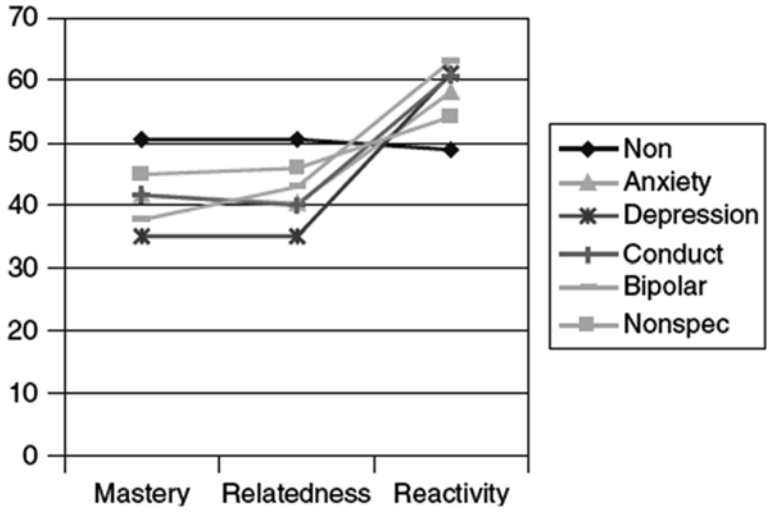

Fig. 3.1 RSCA resiliency profiles for adolescent clinical groups (Reproduced from RSCA Technical Manual, Prince-Embury, 2007)

The Resiliency Profiles of the four clinical groups vary somewhat but share these characteristics in common: high Emotional Reactivity Scale scores (above *T*55) and low Sense of Mastery and Sense of Relatedness Scale scores (below *T*45). These similarities suggest that in spite of differences in disorder, there are overarching themes of higher emotional reactivity and lower personal resources. Implication for preventive screening is that groups or individuals whose Personal Resiliency Profiles are similar to the profiles of the clinical groups might be screened for the presence or vulnerability to potential negative emotional outcomes. It must be noted that although there are differences between the profiles of the diagnostic groups, these differences have not been replicated so that these profiles cannot be used to establish clinical diagnosis (see Prince-Embury & Steer, 2010).

Personal Resiliency Profiles: Normative

Although differences in Personal Resiliency Profile may appear clearly in clinical groups one might ask whether the Personal Resiliency Profile would be useful for screening in normative samples as in universal screening. Characteristic Personal Resiliency Profiles in the RSCA normative standardization sample ages 9 through 18 (stratified by race/ethnicity and parent education level to match the US Census) were identified using cluster analysis, a statistical technique for summarizing the variability of profiles into those that most characterize the sample (Prince-Embury & Steer, 2010). This method produced three Personal Resiliency Profiles that most characterize the normative sample of children and adolescents in the United States. These profiles are displayed in Fig. 3.2. Profile A may be characterized as a high Personal Resiliency

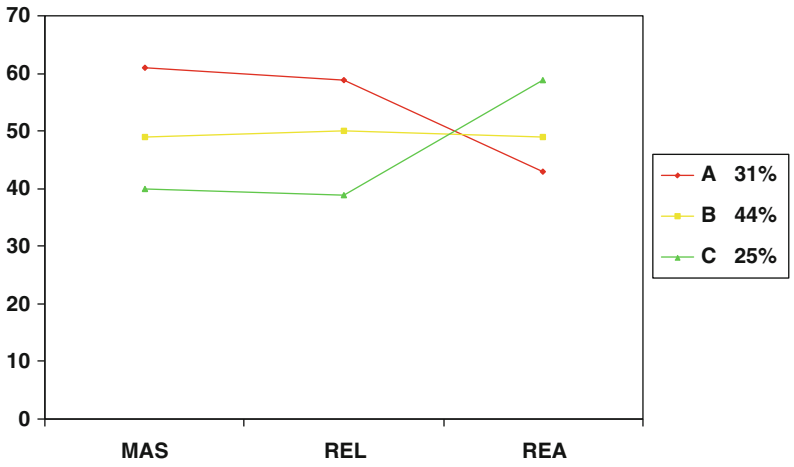

Fig. 3.2 Profiles of personal resiliency in a normative sample. $n = 641$

Profile characterized by high Sense of Mastery and Sense of Relatedness Scale scores (higher than *T*55) and a lower Emotional Reactivity Scale score (lower than *T*50). This high Personal Resiliency Profile cluster represented 31 % of the normative sample. Profile B may be characterized as sufficiently resilient, characterized by Sense of Mastery, Sense of Relatedness, and Emotional Reactivity Scale scores within the average range (between *T*45 and *T*55). Profile B represented 44 % of the normative sample. Profile C may be characterized as a Vulnerable Personal Resiliency Profile and was characterized by lower-than-average Sense of Mastery and Sense of Relatedness Scale scores (below *T*45) along with a higher-than-average Emotional Reactivity Scale score (above *T*55). Profile C represented 25 % of the normative sample. These normative resiliency profiles raise interesting issues. High resiliency group A supports the claim of Ann Masten (2001) of resiliency as "ordinary magic" which is not unusual but characteristic of many children. The existence of Profile C in the normative sample is similar to the resiliency profiles found in clinical samples (see Fig. 3.1). This similarity suggests that RSCA Personal Resiliency Profile may be used in normative samples to identify youth who may be vulnerable but who have not developed psychological symptoms or who are youth who have psychological symptoms but who have not been formally diagnosed.

Linking Resiliency Intervention to Personal Resiliency Profile

Linking resiliency intervention to the Personal Resiliency Profile may take many forms depending on whether the intervention is to be delivered in aggregate to groups or on an individual basis. On an aggregate level, youth who score high in Emotional Reactivity may receive interventions aimed at lowering reactivity,

increasing emotional regulation, and self-calming skills as discussed in "Three-Factor Model of Personal Resiliency and Related Interventions" of this chapter. Youth who score low in sense of mastery or sense of relatedness may receive interventions targeting these areas of resiliency as mentioned below.

1. Sense of mastery: increases optimism, self-efficacy, adaptability, positive expectations, problem-solving skills, executive functioning, judgment, and decision making.
2. Sense of relatedness: increases experience of support, comfort with others, sense of trust, tolerance of others, social skills, ability to listen to others, ability to maintain eye contact, ability to take the role of others, and empathy with others.
3. Emotional reactivity: lowers sensitivity, improves recovery from emotional upset, increases emotion regulation, self-soothing, self-talk, relaxation, or breathing exercises, and decreases emotion-related impairment.

Outcomes Tracking Using the RSCA

The existence of quantifiable measures of personal resiliency, such as provided by the RSCA, allows for the monitoring of outcomes targeted to specific interventions for groups and individuals. In addition, comparisons of pre- and post-scale scores on the RSCA indicate whether changes are statistically significant, clinically significant, and whether they occurred in the area of resiliency that was originally targeted. More detailed analysis may distinguish youth for which the intervention was successful from youth for which the intervention may not have been successful.

The science of targeted resiliency intervention and outcomes tracking is still in its early development. To date, generic interventions are often implemented for identified at-risk groups of individuals without attention to the specific resiliency needs of the group or the individuals in it. Then if outcomes monitoring occurs, the outcome tool is often one that is chosen based on availability as opposed to the targeted need. In addition, heterogeneity of youth in the targeted group and associated variance in the pre-intervention testing may mask any significant changes at the individual level. Below is a list of resiliency enhancement guidelines that may be considered as we work to further develop the accuracy and efficacy of the field.

Resiliency Enhancement Measurement Guidelines

1. The first step is to define specifically what is to be changed. This requires a clear definition of resilience/resiliency. In this regard a distinction between resilience and resiliency is important as resilience is defined as a complex interaction between the person and the environment and resiliency is defined as the personal characteristics of the individual. Resilience is more difficult to assess than an aspect of personal resiliency as the first requires assessment of person, environment, and interaction of the two.

2. The second step is to consider whether your definition of resiliency is one-dimensional or multidimensional.
3. The third step is to locate instruments to assess resilience/resiliency as it has been defined.
4. Is resiliency defined as a trait or relative enduring quality and if so how modifiable is this trait in individuals?
5. Is resiliency defined as learned and situation specific? If so how generalizable is this learning?
6. If looking at the statistical significance of change to document the effectiveness of an intervention, there may be some problems with doing this; small *n*, sample with too much variability in resiliency, or samples containing many youth for which resiliency is adequate to begin with so that any change would be small.

Resiliency Measurement Issues for Pre–Post-Comparison

Aggregate comparison of pre–post-measures may fall short of achieving statistical significance for a number of reasons.

1. The pre-sample may be mixed with respect to resiliency in that youth may differ in initial degrees resiliency. Change would be most likely in those who are least resilient or most vulnerable. In some cases changes for these youth should be examined separately.
2. In addition pre-intervention testing may reveal varied Personal Resiliency Profiles with some youth showing strengths in one area and other youth showing strength in other areas. Individual or idiosyncratic changes may not be detected as these may cancel each other out when considered statistically in aggregate across diverse profiles.
3. Interventions are often global and not strength specific so that impact might not be strength specific or might vary across individuals according to their strength sets. Again these diverse, individual, and sometimes slight effects might cancel each other out when considered in aggregate. Grouping youth by similarity of pre-intervention profile for comparison may increase chances of seeing patterns of change.

Given these issues below are some suggestions to maximize that potential for tapping the impact of an intervention.

1. Analyze pre-intervention sample for relative resiliency. Impact might be larger for those with lower resiliency. Compare pre- and post-intervention resilience for group by pre-intervention resiliency level.
2. Identify groups with different resiliency profiles that indicate deficits and strengths in different areas and analyze these groups separately.
3. Describe change frequency—for total sample, for those who were most vulnerable pre- and post-intervention.
4. Describe areas of most change and for whom.
5. Were there areas of negative change and were these statistically significant?

6. How did actual change compare with the intended change goals for the intervention?
7. Identify individuals for whom there was the most significant change and interview them on the nature of the change for them.
8. If the intervention was very helpful for a few individuals this is important even if a statistically significant effect for the entire group was not achieved.

Summary

In summary this chapter presents a model of personal resiliency that is simplified to three factors based in three core developmental constructs of personal resiliency, Sense of Mastery, Sense of Relatedness, and Emotional Reactivity. The three-factor model of personal resiliency is presented as a simplification of a complex body of theory and research related to resilience/resiliency for the purpose of facilitating the development of targeted interventions to enhance personal resiliency. Specific areas of intervention are described and matched to the three core factors of personal resiliency. The three-factor model does not presume to include all aspects of resilience and specifically does not include environmental factors, intellectual ability, or actual achievement.

Also described is a user friendly assessment tool designed to translate the three-factor model of personal resiliency for use with children and adolescents 9–18. Three global scales are designed to reflect three developmental systems that have been consistently identified as core aspects of personal resiliency, Sense of Mastery, Sense of Relatedness, and Emotional Reactivity. Research suggests that these three scales reflect the underlying constructs in a reliable and valid manner. Unique characteristics of the RSCA are the following. The RSCA describes three core developmental systems underlying resiliency that are well documented in the literature and consistent with factor analytic studies (Prince-Embury, 2007). The RSCA was normed on a US representative sample systematically stratified by race/ethnicity and parent education level allowing *T* scores to be determined based on a representative normative sample that is represented in the US Census.

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