Child & Youth Services, 34:360–386, 2013
Published with license by Taylor & Francis Group, LLC
ISSN: 0145-935X print/1545-2298 online
DOI: 10.1080/0145935X.2013.859906

Routledge
Taylor & Francis Group

Trust-Based Relational Intervention (TBRI): A Systemic Approach to Complex Developmental Trauma

KARYN B. PURVIS and DAVID R. CROSS
Institute of Child Development, Texas Christian University, Fort Worth, Texas, USA

DONALD F. DANSEREAU
Center for Applied Psychology, Texas Christian University, Fort Worth, Texas, USA

SHERI R. PARRIS
Institute of Child Development, Texas Christian University, Fort Worth, Texas, USA

Children and youth who have experienced foster care or orphanage-rearing have often experienced complex developmental trauma, demonstrating an interactive set of psychological and behavioral issues. Trust-Based Relational Intervention (TBRI) is a therapeutic model that trains caregivers to provide effective support and treatment for at-risk children. TBRI has been applied in orphanages, courts, residential treatment facilities, group homes, foster and adoptive homes, churches, and schools. It has been used effectively with children and youth of all ages and all risk levels. This article provides the research base for TBRI and examples of how it is applied.

KEYWORDS adoption, complex developmental trauma, foster care, trauma-informed intervention

Whether coming from a background of abuse, neglect, or trauma, children in these sub-populations often share similar behavioral outcomes because they share a common experience—complex developmental trauma. Trauma can be broadly induced by such risk factors as physical, emotional, or sexual abuse; natural disasters; or traumatic events including medical interventions, long-term hospitalization, and much more. However, for the purposes of this

Address correspondence to Karyn B. Purvis, Institute of Child Development, Texas Christian University, TCU Box 298920, Fort Worth, TX 76129, USA. E-mail: k.s.purvis@tcu.edu

article, we seek to elucidate the impact of trauma among children and youth who have experienced foster care or institutionalization. Harvard University, in 2005, released data confirming that children in the U.S. foster system experienced trauma in the form of post-traumatic stress disorder (PTSD) at a rate more than twice that of combat veterans (Pecora, White, Jackson, & Wiggins), making this a particularly vulnerable population of children and youth.

Complex developmental trauma is a diagnosis that recognizes the global impact of trauma and is described by van der Kolk and Courtois (2005) as "the experience of multiple, chronic, and prolonged, developmentally adverse traumatic events, most often of an interpersonal nature" (p. 402). Early trauma and stress can have a lasting effect on development, triggering delays in social competence (Becker-Weidman, 2009), development of dysfunctional coping behaviors, and significantly altering a child's brain chemistry, particularly when the adverse condition is chronic and there is a lack of nurturing support (Bremner, 2003; Carrion, 2006). For many adopted and foster children, these dysfunctional behaviors create barriers to the development of healthy relationships in new family environments, and without intervention, problem behaviors tend to persist and intensify into adolescence (Verhulst, 2000).

Currently, there is a scarcity of effective treatments that address complex developmental trauma (van der Kolk & Courtois, 2005). One reason for this scarcity is that, as of this writing, the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; APA, 2013) has not made a distinction between "acute trauma," resulting from a single and/or psychologically isolated incident (e.g., experiencing a tornado, the events of September 11, or an auto accident) and "complex trauma," resulting from multiple, diverse psychologically overlapping incidents (e.g., chronic sexual abuse, physical abuse, or even ongoing painful medical procedures induced by a chronic medical condition). Children and youth suffering from complex trauma most often exhibit disorders related to attachment systems, affect regulation, physiology, dissociation, behavioral control, cognition, and self-concept (Cook, Blaustein, Spinazolla, & van der Kolk, 2003). These types of disorders can lead to a variety of diagnoses typically treated with a combination of different approaches. Most often, children are treated through the traditional medical model—consisting of visits to a practitioner's office, with caregivers playing a superficial role in the child's treatment. However, interventions that include caregivers may be more effective because treatment occurs in the child's environment where challenges occur. While children may spend an hour a week in a professional's office, they spend vast hours in the care of their parents or caregivers. In particular it has been noted that relationship-based trauma can only be resolved through loving, stable relationships, such as can be offered by nurturing caregivers.

There are three factors, first identified by van der Kolk (2005), and later discussed by Bath (2008) as the three main "pillars" that should be included in any program designed to treat complex trauma. These are (a) development of safety, (b) promotion of healing relationships, and (c) teaching of

self-management and coping skills. These elements parallel the three evidence-based principles of Trust-Based Relational Intervention (TBRI) developed at the Texas Christian University Institute of Child Development.

The three TBRI principles are

1. Empowerment—attention to physical needs;
2. Connection—attention to attachment needs; and
3. Correction—attention to behavioral needs.

These principles help both caregiver and child learn healthy ways of interacting so both are able to play a role in the healing process.

TBRI has become formalized over time through ongoing research in our lab; however, its foundations emerged 14 years ago at our first summer day camp for foster and adopted children who had experienced neglect, abuse, or trauma. At that first camp, later named Camp Hope by the parents whose children attended, we documented unprecedented behavioral and attachment gains in our 10 young campers under the age of 10. Camp protocols were planned to address the physical, behavioral, and relational needs of the children, and the camp environment was rich in sensory activities, social skills groups, "nurture groups" (described later in this article) and more. Parents and researchers were caught off guard by the dramatic gains in such a brief intervention. While we were exhilarated by the gains we documented, within two months after camp, our joy turned to grief, as we watched the gains erode in some children, as they deteriorated to their former aberrant behavioral and relational strategies. This devastating loss propelled us to study further the gains of camp, to understand how these gains had occurred, and to understand why for some children they were lost so quickly. What we discovered, and our journey toward understanding, is illustrated here through data and individual stories from a rich data set gathered over the past decade and a half. As part of that journey, through research and program evaluation, TBRI has emerged as a clear set of developmental principles for bringing healing to at-risk youngsters.

Previous publications briefly summarize the main components of TBRI (Purvis, Cross, & Pennings, 2009; Purvis, Cross, & Sunshine, 2007), and there is growing empirical evidence showing positive outcomes for the TBRI model as a whole (Purvis & Cross, 2006; Purvis, Cross, Federici, Johnson, & McKenzie, 2007). However, there is still a need to provide a thorough review of the empirical evidence supporting each component of TBRI and an illustration of each component, which is the purpose of this article.

THE TBRI PRINCIPLES

First, the TBRI empowering principles address the ecological (external/environmental) and physiological (internal/physical) needs of the child.

By ensuring these basic needs are met, the effectiveness of the connecting and correcting principles are greatly improved. Second, the connecting principles address relational and attachment needs, focusing on awareness, engagement, and attunement. Third, the correcting principles teach self-regulation and appropriate boundaries, and promote healthy behaviors for caregiver and child (see Appendix for examples of typical activities for each of the principles).

The Empowering Principles

We know that a child's emotional development, including the ability to form secure attachments, is affected by ecological and physiological factors (Bronfenbrenner & Morris, 1998; Lickliter, 2008). The empowering principles set the stage for positive change by ensuring healthy conditions for children. For example, a child who is chronically hungry due to poverty has little capacity for learning or joyful play because his fear of hunger dominates his thoughts and behaviors. Also, creating an environment that fosters felt-safety is a critical component in this process. This assumption emphasizes the difference between a child actually *being safe* and *feeling safe*. For although an adoptive parent may know with certainty that the child they adopted from hard places will never suffer devastating hunger or malnutrition again, the message must be conveyed in ways the child can understand. For these parents, partnering with their child to create a sense of safety may include strategies such as helping the child shop for nourishing snacks (e.g., fruit, nuts, raisins) to put in a specially prepared bowl in their room. Wearing a fanny pack with nutritious snacks may also give "evidence" to the child that they will not be hungry again. Before, the caregiver knew that food would always be available, but now with these strategies, the child has tangible evidence that his or her needs will be met. By providing this type of concrete evidence, a caregiver can partner with their child to create a powerful sense of felt-safety. The main TBRI empowering principles are summarized below.

Safe and structured environment

A major detrimental outcome of complex developmental trauma is chronic fear, which impacts both cognitive and emotional functioning (Anda et al., 2006; Perry, 2001). However, children who feel that their environment and relationships are safe and predictable can learn to trust others and develop healthy emotions and behaviors that are trust-driven rather than fear-driven (Knight, Smith, Cheng, Stein, & Helmstetter, 2004). All TBRI principles and practices are designed to create this sense of felt-safety in children.

A key ingredient to creating a safe, predictable environment is to ensure smooth transitions for children. The three main types of transitions are (a) daily transitions, (b) major life transitions, and (c) developmental transitions.

Daily transitions are the "joints" that connect daily experiences, and these pose challenges for children who are fear-driven and for those with poor self-regulation. By explicitly managing daily transitions (e.g., providing children with advance notice before transitions) problem behaviors can be reduced significantly (Sainato, 1990). Simply alerting a child who, for example is swimming, that in "five minutes we'll need to get out of the pool," can provide these transitions. A more emotionally fragile child may require a series of transition alerts. For example, giving alerts at 15, 10, 5, and 1 minute before a transition.

Major life transitions (e.g., first day of school, joining a new family) are also stressful. We can help children negotiate these difficult situations through a variety of strategies, including life books, memory books, storytelling, and journaling (Cowan & Cowan, 2003; Pennebaker & Stone, 2004; Nicolopoulou, Barbosa de Sa', Ilgaz, & Brockmeyer, 2010). Life books can be used, for example with a former foster child who has had numerous placement changes prior to adoption and who is fearful of changes or transitions. Creating pages with photos, drawings, and personal notes can help the child begin to settle in with a knowledge that he has arrived in his "forever family." Story telling is a powerful tool that has been used across cultures for many generations. Around a fireplace, a hearth, or a kitchen table, the telling of our stories has provided continuity and transition throughout time. A high-ranking marine officer reported in personal conversation, that post-traumatic stress disorder was unknown among the military until the Viet Nam war because of this powerful telling of stories. Before that time, soldiers were transported to and from war in large transport ships, spending weeks or even months crossing the ocean. During the days of their long journey, it is reported that they played cards by the hours and told their stories over and over and over again. Being safe with others who understood their story and "giving voice" to their fears, pains, terrors and hopes, provided a healing transition for those military personnel returning from war.

Developmental transitions occur as the brain continues to reorganize itself during major developmental milestones throughout the lifespan (e.g., the transition from infancy to toddlerhood, the transition from childhood to adolescence) (Nelson, 2011). These transitions can be seen as opportunities to positively impact a system while it is unstable and reorganizing itself (Brazelton, 2000; Niklasson, Niklasson, & Norlander, 2010). Overall, we can help children feel safe by increasing predictability and perceived control throughout the day (e.g., charting daily or life events) (Pennebaker & Stone, 2004). Family or daily rituals are also an effective way to increase predictability, manage transitions, and build family cohesion (Crespo, Kielpikowski, Pryor, & Jose, 2011). Knowing, for example, that the family will eat dinner together each evening at 6:00 p.m. becomes a stabilizing ritual in the life of a developing child.

Telling of our stories has been a mechanism for healing throughout recorded history in all cultures and ages. On a recent trip to Africa, part of

our team met with the First Lady of an African nation that experienced genocide during the previous generation. Aware of the deep, gaping wounds that left their mark on all generations of that nation, the First Lady asked how to bring healing to victims of genocide for whom much of healthy development had come to a halt. Our answer was categorically clear—throughout all time, we have healed by the telling of our stories.

Sensory needs

Children with histories of institutionalization (long-term hospitalization or orphanage care), trauma, and/or prenatal or perinatal stress often have sensory processing disorders that can negatively impact behavior, social skills, motor skills, and academic performance (Cermak, 2009; Cermak & Groza, 1998). These children may exhibit mystifying behaviors. For example, they may seem to be "picky eaters" refusing foods with exception of a singular texture food. Oral sensitivity to foods of different texture is often a clue to Sensory Processing Disorder. In addition, they may constantly break pencils and crayons if they have a sensory issue with pressure (called a proprioceptive deficit). Children who are volatile if their socks or turtleneck sweaters are too tight might be also manifesting the same proprioceptive deficit. One elementary-school child we served was punished for punching another child in the stomach while standing in line for lunch before the principal and teacher were alerted to his sensory deficit in processing the pushing and shoving of the child standing behind him. Sensory Processing Disorder (SPD) limited the boy's capacity to understand that the child he hit had not intended to harm him, but was rather jostling playfully while waiting for lunch. Behaviors such as this are frequently misunderstood as malicious, rather than sensory defensiveness, creating additional risk for children and youth with SPD.

However, sensory processing deficits can be overcome with appropriate interventions that address the sensory system (Ayres, 1972a, 1972b; Fazlioglu & Baran, 2008; Kemmis & Dunn, 1996; Parham, 1998). For instance, a protocol of regular, caring touch improves physiological health, attachment issues, and sensory issues (Field, Hernandez-Reif, & Diego, 2005; Montagu, 1986). Also, programs including a daily schedule of frequent, systematic somatosensory stimulation followed by physical activity have documented significant improvement for children with sensory issues (Fazlioglu & Baran, 2008; Purvis, McKenzie, & Cross, 2012; Purvis & Cross, 2007). Sensory activities, sensory diets (a daily schedule of sensory activities and experiences), and sensory rooms have all shown to help children and adolescents organize their mental and emotional states (Dorman et al., 2009; Kranowitz, 2006; Miller & Fuller, 2007).[1]

Nutrition

We know that good nutrition is important for behavior development (Pollit, 1988; Powell & Grantham-McGregor, 1985). Proper nutrition, including

multi-vitamin and multi-mineral supplements, can improve cognitive and emotional functioning with behaviorally disordered children (Kaplan, Crawford, Gardner, & Farrelly, 2002; Kaplan, Fisher, Crawford, Field, & Kolb, 2004; Walsh, Glab, & Haakenson, 2004). Foods such as turkey, fish, whole grains, nuts, lentils, and Omega-3 fatty acids provide the building blocks for healthy brain chemistry and improved behavior in children (Benton, 2007; Bourre, 2004; Garland & Hallahan, 2006; Uauy & Dangour, 2006). Longitudinal research documents increased levels of aggression and violence among youth who suffered early malnutrition (Galler, Bryce, Waber, Medford, Eaglesfield, & Fitzmaurice, 2011; for a review see Raine, 2002). Caregivers of those who experienced significant early malnutrition may find great benefit in specialized testing and intervention, such as may be offered by a certified nutritionist or medical doctor who specializes in functional medicine.

Children and youth with histories of prenatal exposure to substance (i.e., drugs, alcohol) and those who experience early hardships often have significant changes to insulin receptor sites, making them subject to dramatic shifts in behavior when their blood sugar begins to drop below optimal levels. In our work with children, we implement a protocol of offering nutritious snacks every two hours. Regularly scheduled snacks and meals (that include protein and complex carbohydrates) are empowering because they ensure adequate, sustained blood sugar levels to support positive behaviors, stable moods, and optimal cognitive functioning including attention and self-regulation (Benton, Brett, & Brain, 1987; Benton & Stevens, 2008; Gailliot et al., 2007). Caregivers we have trained in TBRI report significant positive changes in behavior simply by stabilizing blood sugar levels. This is obviously a challenge in settings where food availability is limited and where costly nutritious snacks are outside the financial means of a family or facility. In our work with orphanage staff in Romania, Ethiopia, and Rwanda, some facilities we have trained were only able to make more frequent, but smaller portions of the gruel that was available to them.

Hydration also improves mental functioning, including attention and memory performance (Edmonds & Burford, 2009; Wilson & Morley, 2003). Of note, one neurotransmitter, glutamate, is associated with aggressive behaviors, seizures, and various volatile behaviors. This neurotransmitter is more active in conditions of dehydration. Behavior and cognition can be improved simply through making water and other hydrating drinks readily available (Bar-David, Urkin, & Kozminsky, 2005; Edmonds & Jeffes, 2009). We have analogous findings in our research, in which we teach caregivers to offer water and food every two hours to children and youth in their care. A TBRI-informed residential facility in Texas that houses nearly 200 adolescents who are unable to live with their families, recently began offering snacks and drinks every two hours, as well as making them readily available at all times. Caregivers in that facility have documented significant improvements in both mood and behavior. In taped interviews, staff noted a significant

deepening of trust with the youth, as they experienced felt-safety about their needs for food. In all, frequent, healthy snacks and drinks can improve children's behavior.

Other empowering principles

Adequate sleep is a primary determinant of child and adolescent well-being, including cognitive functioning and emotion regulation (Mindell et al., 2011). Children from hard places often have sleep dysregulation for a variety of reasons, including the fact that some of them were harmed in the night. Consulting with one residential facility in the case of two youngsters, ages five and six, who were in protective custody of Child Protective Services, we recommended that the siblings be provided with weighted blankets for bedtime, which provide deep muscle input and calming (Novak, Scanlan, McCaul, MacDonald, & Clarke, 2012). Calling early the next morning, delighted staff reported that both boys slept soundly through the night for their first time since coming into protective custody. These seemingly simple tools can have significant impact in providing a healing environment for at-risk youngsters.

Also, regular physical activity promotes cognitive, social, and emotional development (Best, 2010) and deep-breathing exercises (e.g., yoga or other) improve well-being and mental functioning (Peck, Kehle, Bray, & Theodore, 2005; Stueck & Gloeckner, 2005). For example, a program developed for school-age children at Yale University, ABC for Fitness (Katz et al., 2010), creates opportunities for brief bursts of physical activity such as jumping jacks or running in place every 60 minutes during school hours. Documented changes include not only lowering of obesity, increasing physical fitness, and improving academic performance, but also lowering of medications such as those for asthma and ADHD.

The Hope Connection summer day camp for children with histories of abuse, neglect, and trauma provides physical activity, dance movement, or opportunities for outdoor play every two hours. Data from the camp documents dramatic reduction in the stress chemical, cortisol, as well as reduction in negative behaviors and significant improvement in positive behaviors (Purvis, Cross, Federici, et al., 2007). We have implemented similar activities in schools, RTCs, homes, and orphanages with equal success. Overall, the TBRI empowering principles meet children's basic physical needs and support healthy emotional, relational, and behavioral development.

The Connecting Principles

The connecting principles enable both child and parent to experience the personal and interpersonal behaviors that build trust and lead to secure attachment. This set of principles closely resembles behavioral connections between a mother and her newborn infant, consisting of sustained eye

contact, affectionate touch, and consistently high levels of attention to needs. Biological mothers naturally "give voice" to their infants, and TBRI is designed to "give voice" to those who didn't have that opportunity from their biological parents. Building secure attachment relationships is important, including findings that the origins of self-regulation stem from a child's attachment relationships (Geva & Feldman, 2008; Schore, 1994, 2001). As an attentive mother meets her infant's needs, she "imposes" regulation on the child—imposing warmth when the infant is cold, food when the infant is hungry, comfort when the infant is upset. In each case, the parent provides an "external modem" for regulation of physical and emotional needs. This tender, consistent meeting of needs becomes the foundation on which this developing child will learn to regulate his own needs and emotions. Connecting principles provide the foundation for attachment and self-regulation and include: awareness (of others and self), playful engagement, and attunement. An overview of the *connecting* principles follows.

Observational awareness

Work with traumatized children requires keen awareness (Endsley, 2006). It is critical for caregivers to observe their children's behavioral and physiological responses during interactions to monitor anxiety and comfort level (Grietens & Hellinckx, 2003; Siegel, 1999). By recognizing signs of stress and anxiety, caregivers can respond appropriately to children who are often unable to verbalize their needs. TBRI emphasizes recognition of nonverbal markers of anxiety such as pupil dilation, heart rate, depth of respiration, and muscle tension so that needs do not go unmet (Perry, 1994). Insightful caregivers who become deeply aware of nonverbal cues of fight, flight, or freeze can often avert adverse behavioral episodes through attentive responsiveness.

Self-awareness

It is also critical for caregivers to be aware of their own emotional state, attachment style, and emotional availability. Empirical studies have found that the attachment style of a primary adult caregiver predicts the child's attachment style (Dozier, Stovall, Albus, & Bates, 2001; Steele, Steele, & Fonagy, 1996; Steele, Hodges, Kaniuk, Hillman, & Henderson, 2003; Steele et al., 2009), and child's well-being (Madigan, Moran, Scheungel, Pederson, & Otten, 2007; Cassidy, 2001; Ward, Lee, & Lipper, 2000). In our work with the highest risk children and youth we frequently find caregivers who have significant unresolved childhood or early adult histories of their own and are inadvertently triggering maladaptive behaviors in the children they are serving. For example, a woman who had the stillbirth of an infant may guard her heart unknowingly so that she doesn't experience the wrenching loss again. These individuals, though fully available for their child's physical needs,

may find it difficult to be emotionally available for healing connections with their child.

In our international work, we frequently find a high percentage of orphanage staff that were themselves orphanage-reared. Because they never *received* tender, attentive care, it is a significant challenge for them to *give* tender, attentive care. We typically plan to implement nurturing activities with caregivers themselves during our days of training orphanage staff. The good news is that an adult's attachment style can change (Cassidy, 2001; Crowell, Treboux, & Waters, 2002) and one objective of TBRI is to provide steps that adults can take to facilitate positive changes in their attachment styles. One family, who under our supervision implemented TBRI principles in their home with their violent eleven-year-old son, found that the mother's attachment style was dramatically altered from being dismissing of attachment to being secure in her attachment relationships. The boy, who had multiple psychiatric diagnoses and had a history of aggression against his mother and sister required intense attention to his needs and yet, in learning to recognize her son's needs, this mother began to recognize her own unmet needs and to deal with her own childhood attachment experiences and attachment needs.

In addition to education about promoting healthy attachment, caregivers who implement TBRI often take the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985). Feedback from the AAI informs caregivers about their own attachment styles and provides awareness of emotional "filters" that influence their perceptions of their children and their behaviors toward them. Caregivers are then shown positive steps they can take to form secure attachment relationships with their children.

Skills of attachment

The skills of attachment (Cassidy, 2001) are consistent with TBRI. These are: giving care, seeking care, feeling comfortable with an autonomous self, and negotiation. The connecting principles cultivate "giving care and seeking care," which are modeled and practiced as part of TBRI nurture group activities (some of these nurture activities are derived from Theraplay activities) (Jernberg & Booth, 1999; Purvis, Cross, Federici, et al., 2007). Connecting principles also promote "feeling comfortable with an autonomous self," which is important for healthy relationships and stems from secure attachment. Various types of "negotiation" and compromise are found in the connecting and correcting principles. TBRI trained caregivers can actually reduce aggression in the children they serve by "giving voice." In TBRI-informed environments, a child who is misbehaving may be asked, "Can you tell me with your words and not your behavior?" For a child or youth who persists in misbehavior we may offer negotiation opportunities, such as "If you don't want to turn the TV off now, would you like to ask for a compromise?" This giving of voice, as we call it, often becomes a firm foundation for developing trusting relationships,

especially for children who lost their voices early in childhood because of the unresponsive or abusive environments in which they were harmed.

Playful engagement

Playful engagement produces warmth and trust between caregivers and children (Panksepp, 2000, 2002). It disarms fear, promotes attachment, and builds social competence (Brown, 2009; Jernberg & Booth, 1999; Robison, Lindaman, Clemons, Doyle-Buckwalter, & Ryan, 2009). Mothers who engage their infants in playful interactions naturally enhance development of attachment, socialization, and language (Montagu, 1986). However, if a child lacked this type of early playful connection, it can be cultivated through therapeutic play activities. Theraplay is an attachment-based model of playful interaction that resembles the natural playful activities observed between nurturing parents and their infants. Theraplay activities can be used to teach parents of older children to interact playfully. These activities closely resemble the interaction style that is at the heart of TBRI.

In a typical Theraplay session, the therapist guides parent and child to engage in nurturing, playful interactions that include playful touch and eye contact (Booth & Lindaman, 2000; Fesperman & Lindaman, 1998; Jernberg, 1984; Lindaman, 1996). It has been our experience that even adolescents who seem resistant and challenging actually love the opportunities for joyful, silly laughter and games. Through playful engagement, caregivers can become attuned and responsive to the children's immediate needs. Insightful caregivers can even redirect negative behaviors playfully, such as a child who is demanding forcefully that the parent give them juice may be asked playfully, "Are you askin' or tellin'?" or "Can you try that again with respect?" I recently observed the father of a four-year-old whose son did not want him to put on his shoes, and he demanded "NO! Mommy do it!" The insightful father gently guided him to ask with respect, to which his youngster replied, "Can mommy please put on my shoes?"

Attunement

Attunement has been defined by Merriam-Webster's Dictionary as the capacity to "bring into harmony" or "to make aware or responsive." Regardless of the intervention used, effectiveness of parent–child interventions is correlated to the degree that parents are involved with and are responsive in creating this type of harmony (Mahoney, 2009). Through verbal and nonverbal nurturing communications between caregiver and child, attunement can be achieved through matching behaviors, eye contact, voice and inflection, body position, and safe touch. For instance, voice quality (tone, volume, cadence) is a powerful part of interpersonal engagement (Finset & Del Piccolo, 2011; Malloch & Trevarthen, 2010) and touch is a powerful tool

for nonverbal communication, but must be used carefully with formerly abused children and youth (Field, 2003; Finset & Del Piccolo, 2011). Matching, the act of mimicking facial expressions, sounds, or actions, develops naturally in healthy parent–child relationships and fosters attachment and felt-safety (Field, 1995; Jonsson, Clinton, & Fahrman, 2001; Schore, 1994). Behavioral state matching can facilitate harmonious social interactions with children of any age (Bernieri & Rosenthal, 1991; Field et al., 1992).

While maltreated children may have little or no experience with matching, foster or adoptive parents can learn to initiate age-appropriate matching interactions or activities to develop a stronger connection to their child (Zuckerman & Spielberger, 1976). At times in our work with at-risk children, we will offer snacks such as Tootsie Roll Pops. Of interest, as a child feels safe in our care, he will begin to request the same color Tootsie Roll Pop as his mentor. However, there may also be times when a caregiver chooses the same color snack as their young buddy, only to see the child return that candy to the bowl and chose another color. This simple behavior provides an important clue about how closely the child can be connected to his caregivers at that time. When caregivers are taught to carefully, attentively enter the child's physical and emotional space, a new foundation for trust begins to emerge, bringing with it behavioral and physiological gains. Data from our summer camps demonstrate dramatic improvement in behavior coupled with dramatic reduction of the stress chemical, cortisol. For the children whose fear and reactivity is reduced (as evidenced by reduced stress chemical cortisol), gains in behavior, cognition, and even language are greatest (Purvis & Cross, 2006).

Overall, the connecting principles give caregivers tools to build trusting, secure attachment relationships with their children. Improving the caregiver–child relationship is key to reversing the adverse effects of early stress on the brain, reducing stress-related behavior, and improving psychosocial functioning (Fisher, Gunnar, Dozier, Bruce, & Pears, 2006). It has been said that relationship-based trauma can only be healed through a nurturing relationship and the capacity for connecting is the core ingredient for cultivating that type of relationship.

The Correcting Principles

Parental regulation of food, warmth, sensory input, and emotional soothing during infancy and early childhood provide physical and emotional security that create a foundation for the development self-regulatory behaviors. Maltreated children often lack this foundational regulatory support (Als, Lester, Tronick, & Brazelton, 1982; Brazelton & Greenspan, 2000; Tronick, 1995). Regulatory disordered infants with moderate to severe difficulties will not outgrow these issues without intervention (DeGangi, Porges, Sickel, & Greenspan, 1993). In our summer camp for at-risk children, we play regulatory games to teach self-calming and self-awareness. For example, in one of

our learning groups (called a Nurture Group) we will practice several skills for self-regulating, such as deep breathing, using fidgets, and pressing the parasympathetic pressure point just over the middle of their lip. Due to the holding of their finger sideways to press across the top of their lips, the children call this activity the "magic mustache." After the children practice self-calming, we then give them toy Nerf guns with instructions: "There are only two rules for shooting someone. First, you must not shoot in the face and second, you must ask permission and only shoot the Nerf gun IF they say yes." Regulatory skills are practiced in numerous ways through this playful activity. The children practice self-calming/regulation both before the game and after the game. In addition, they must regulate their actions, first asking permission, second waiting for an answer, and third, NOT shooting their Nerf gun toward a child who says "no" or toward the face of a child who says "yes." When learned in this playful setting, these regulatory skills generalize to other settings at a fairly impressive rate. In addition to our summer camp protocol, we have implemented these activities in schools, homes, residential facilities, group homes, and orphanages.

The objective of the correcting principles is to build the child's social competence (Miltenburg & Singer, 1999) which can only be successful after establishing a foundation of empowerment and connection. The correcting principles are also based on cognitive behavioral therapy (CBT), which is effective in treating a wide range of childhood disorders, including depression (Stark, Sander, & Hauser, 2006; Verdeli, Mufson, & Lee, 2006), aggression (Lochman, Powell, & Whidby, 2006; Sukhodolsky, Kassinove, & Gorman, 2004), and post-traumatic stress disorder (Cohen, 2005; Dalgleish, Meiser-Stedman, & Smith, 2005). Behavioral training that is proactive, rather than reactive, is effective in improving social problem-solving and conflict management skills in children (Webster-Stratton & Hammond, 1997). In the example of the Nerf game, the children are practicing appropriate behaviors, which begin to pervade other interactions. This proactive teaching reduces the need for corrective action by adults. By planning how to handle predictable problem issues in advance, the child is prepared to react more appropriately with the practiced replacement behavior (Colvin & Sugai, 1988; Colvin, Sugai, & Patching, 1993). The correcting principles consist of both proactive and responsive strategies to promote appropriate behaviors.

Proactive behavioral strategies

TBRI proactive strategies are designed as preventative teaching measures, and consist of verbal reminders, behavioral rehearsals, role play with others or with puppets, teaching life value terms, and demonstrations of rule-following or socially appropriate behaviors that are presented in settings where problem behavior is likely. For example, role-playing involves practicing a "script" between caregiver and child to allow the child to practice appropriate responses to frustrations he or she may encounter. Working with a 16-year-old

who was in a residential treatment facility (RTC) due to acts of violence against her family, we found that script practice has currency even for older youth. We would practice "showing respect" through a playful script, but first start by showing "NO respect" giving the youth an opportunity to play-act her aggression, and her typically mouthy responses. Then we would follow with a behavioral re-do, and do the same skit with the young woman then practicing respectful words. Adult caregivers involved in the script practice as well as the young woman, laughed with delight as they took turns being, first the defiant child, and then the staff person. Even this young woman who had tried to cut her mother's throat with a butcher knife was able to learn new prosocial skills in the context of this playful, proactive environment. Another script that yielded positive outgrowth with this high-risk adolescent was "use your words." Previous to our work with her, when overwhelmed, she would try to run away, swallow something sharp to harm herself, or even try to choke or hang herself with a drawstring from her jersey. Through practicing in safe, playful settings through skits and puppet-play, she learned to use words like "I am feeling so sad" or "I am angry about that!"

Life-value terms help create a language and culture of mutual respect; similar in purpose to character education programs (Lee & Perales, 2005; Purvis, Cross, & Sunshine, 2007). Practice with life values provides children with tools to resolve issues appropriately in real-life situations. Life-value terms include: using respect, making eye contact, using words to replace negative behaviors, being gentle and kind, accepting consequences, accepting "no," asking permission, and others. When proactive strategies are practiced regularly, problem behaviors become less frequent as children internalize appropriate behaviors for getting their needs met. With the young woman in the RTC for example, violent incident reports were reduced by 70% within weeks, through these playful interactive exercises. Although behavioral gains were almost immediate for this teenager, it is important to remember that it takes sustained, consistent, repetitions over time, in order for a youngster to be able to self-regulate with the support of an attentive adult. Based on current understanding of brain development and our own experience, lasting change will require, on average, one month per year of age for a child or youth from hard places to develop new beliefs and new behaviors, supported by compensatory brain development.

Responsive behavioral strategies

While proactive training is effective, there may still be instances when challenging behaviors are exhibited (although these should decrease over time) and in these cases responsive strategies may be necessary. Responsive strategies include Levels of Response and the IDEAL Approach, which were developed as part of the TBRI correcting principles to guide caregivers in resolving problem behaviors when they occur.

Levels of Response, described next, identify responsive practices that are matched in intensity to the level of risk or challenge, and yet are purposeful in maintaining the connection with the child or youth:

Level One: Playful Engagement—A low-level challenge, for example mouthiness or verbal disrespect, may be met with playful engagement. For example in response to a child who demands "Give me that crayon!" the caregiver may respond playfully, "Are you askin' or tellin'?" Then the caregiver guides the child to a behavioral re-do in which the child asks with respect for the crayon.

Level Two: Structured Engagement—With a slightly elevated challenge, such as when the child doesn't respond appropriately to playful engagement, the caregiver may offer choices. For example, a six-year-old on the playground who demanded that her teacher pick her up and carry her in, was asked at Level One, if she was "askin' or tellin'." The youngster replied forcefully that she was telling, to which the teacher responded, "You have two choices, you may ask with respect or you may simply walk into the building yourself." At that level, the young girl asked with respect, and the teacher then carried her playfully into the building.

Level Three: Calming Engagement—When there is a risk of full escalation, the caregiver must be carefully attuned to this danger. At this level, caregivers are encouraged to give the child or youth a chance to do "time-in" and think about what they need while the adult is nearby. An alternative we have used in RTCs and homes with adolescents, is that in advance of difficult behaviors, the caregiver and youth may choose a "quiet place" to which the youth can ask to go when they need time to self-regulate. Typically after a few minutes the adolescent is able to return to the conversation, knowing what they need to say or do.

Level Four: Protective Engagement—At Level Four there is significant threat of violence or harm by the child, either to himself or to someone else. At this level, TBRI encourages caregivers to contain the violence while remaining calm and reassuring. Caregivers should seek formal training in an intervention accepted by laws in their state or regulations of their organization. When the violence passes, the caregiver remains with the child or youth until the connection is re-affirmed and the youngster feels safe and secure again.

Notably, in each of these levels, the goal is to sustain connectedness while guiding the child to appropriate behaviors and responses, and for the child to know that a safe adult will help them regulate until they are able to regain self-regulation. Levels are not intended as a punishment, but rather as a regulatory support. Negotiation is a critical component of all TBRI strategies, as we seek to give voice to children who have lost their voices. In particular, negotiation is vital in both proactive and responsive strategies because many harmed children and youth have learned to use violence,

manipulation, control, or triangulation to keep themselves safe and to get their needs met. We significantly diminish the frequency, intensity, and duration of behavioral episodes by "giving voice" for negotiation. One adolescent girl we served had been sexually abused by numerous adults and was indiscriminant in touching adults who worked with her in our camp. We engaged her in negotiating her need for healthy touch and hugs by demonstrating first, how to get a hug by asking (NOT simply coming to adults and touching them indiscriminately). In addition, we demonstrated healthy touch and unhealthy touch, letting her practice with us. Finally, we demonstrated body-space with a game of hula-hoops—with both adult and teen each holding a hoop around their body. The adult holding a hula-hoop around herself demonstrated "This is my body-space. No one can come into my body-space without permission." Following, the adult said, "That is your body space and no one can come into your space without permission. So how can I get a hug from you if I want one?" Then the teenager practiced the skills of negotiating her need for hugs and safe touch by asking with respect for safe, physical affection.

The IDEAL response, described next, is an acronym to remind caregivers of the five principles that should be used when challenging behaviors occur:

I—Respond *immediately* to the behavior (Hester, Hendrickson, & Gable, 2009) because research proves that learning is greatest when the response is in swift temporal proximity to the behavior.

D—Respond *directly* to the child through eye contact, giving them undivided attention, and bringing them nearer to you physically for teaching and guidance (Danforth, 2006) because research documents significant shifts in brain chemistry and activity during eye contact and proximity.

E—Respond in an *efficient* and measured manner. This is reflected in Levels of Response, in which caregivers use the least amount of firmness, corrective effort, and verbal directive that is required to correct the behavior (Hester, Hendrickson, & Gable, 2009). This strategy also helps children gain trust, knowing adults will not overreact to their behaviors

A—The response is *action-based*. Redirect the child to practice an appropriate behavior alternative. Physically lead them through a real-life "re-do" when possible. Once the "re-do" is successful (because they used the appropriate alternative behavior), praise the child (Heimlich & Ardoin, 2008; Hohnke & Sur, 1999; Reed, 1996).

L—*Level* the response at the behavior, not at the child. Never reject the child as a person,only respond to the behavior (Barber & Harmon, 2002; Mills & Rubin, 1998).

OTHER THERAPEUTIC INTERVENTIONS

In addition to TBRI, there are other effective therapeutic interventions for children with histories of trauma that are alternatives to the traditional medical

model. However, these typically focus on a limited number of symptoms, or are tailored for a specific population. TBRI addresses all major issues that are linked with complex developmental trauma and has been adapted for a variety of settings including international orphanages, residential group homes and treatment centers, adoptive and foster homes, schools, therapeutic day camps, and for all ages of children, including adolescents. Six respected models that are effective in treating specific symptoms, clusters of symptoms, or populations, include (a) Circle of Security, (b) Theraplay, (c) Attachment and Biobehavioral Catch-up (ABC); (d) the Neurosequential Model of Therapeutics (NMT), (e) the Sanctuary Model, and (f) the Attachment, Self-Regulation, and Competency model (ARC).

Circle of Security (Hoffman, Marvin, Cooper, & Powell, 2006) is a video-based parent training program that focuses on enhancing attachment relationships between parents and young children. Theraplay (Jernberg, 1984) teaches parents to use playful interactions to improve attachment and behavioral issues. As mentioned previously, Theraplay activities are utilized as one component of the TBRI intervention and we recommend Circle of Security for those who need additional intensive assistance in forming attachment relationships with young children. The ABC program (Dozier et al., 2006) includes 10 weekly in-home intervention sessions that enhance self-regulation and attachment relationships for children under age four, and improves parent sensitivity toward their children.

The Sanctuary Model (Rivard, Bloom, McCorkle, & Abramovitz, 2005) is used in residential treatment centers and focuses on creating a safe, democratic therapeutic community environment and empowering youth to develop the ability to positively affect their own lives and their communities through participation in a trauma recovery program and cognitive-behavioral therapy. The ARC Model (Kinniburgh, Blaustein, Spinazzola, & van der Kolk, 2005) provides general intervention guidelines for children with histories of complex trauma. ARC focuses on four principles (a) creating a structured and predictable environment by establishing rituals and routines, (b) increasing caregiver capacity to manage intense affect, (c) improving caregiver–child attunement, and (d) increasing the use of praise and reinforcement. However, while ARC includes a list of possible strategies that practitioners can use, it is designed to be a theoretical framework to guide practitioners to make their own intervention choices.

In addition to TBRI, another intervention that treats all major issues linked with complex developmental trauma is NMT (Perry, 2009). The three central elements of this model include: (a) obtaining a developmental history of the child (including known history of maltreatment, institutionalization, etc.), (b) performing a current assessment of functioning (including a brain map), and (c) prescribing a set of recommendations for intervention and enrichment. Typically, NMT prescribes a specific sequence of interventions (e.g., educational, enrichment, and therapeutic) for each child. With NMT, the sequence of interventions is important with the most primitive brain issues

such as self-regulation and anxiety addressed first, and higher-order cognitive processes addressed in later stages of treatment. As noted by Bruce Perry (2009), one of the difficulties with NMT is that it requires an experienced clinician to oversee the process. Expense involved in using this approach can be prohibitive and it is designed for use on an individualized basis.

One of the major differences between NMT and TBRI is that TBRI utilizes generally accepted and scientifically validated practices that can be used with (or readily adapted to) all children and in all caregiving environments. We have trained orphanage staff in Romania, Ethiopia, and Rwanda, as well as courts, churches, schools, RTCs, and foster and adoptive families. In addition to its environmental adaptability, any nurturing caregiver can be trained. TBRI is not a clinical model but rather a caregiving model. Children may be assessed to determine if they have specific sensory or behavioral issues, but even without testing, TBRI can be used with optimally developing and with at-risk populations to improve their overall outcomes. For both NMT and TBRI, outcomes of research studies have been positive and additional studies are underway to further add to the empirical base for both models.

SUMMARY

Children with histories of complex developmental trauma, including those who have experienced foster care, institutionalization, maltreatment, and neglect, present unique challenges for caregivers that strive to provide the care and support they need. Treatment for the psychological and behavioral issues common to these children has typically been administered through the traditional medical model. However, long waiting lists for treatment and lack of practitioner expertise in dealing with complex developmental trauma have created a need for alternative forms of treatment. TBRI is a relationship-based model that can be administered by nurturing, insightful caregivers, and can be implemented in virtually any environment with children and youth of any age and any risk level. Holistic in nature, cost effective to implement, and developmentally respectful of the impact of trauma, TBRI appears to hold significant potential for creating positive impact in the lives of children and youth who have come from the hard places.

NOTE

1. For further resource see the following Web sites: The Out-of-Sync Child, http://out-of-sync-child.com; and SPD Foundation, http://www.spdfoundation.net.

REFERENCES

Als, H., Lester, B. M., Tronick, E. Z., & Brazelton, T. B. (1982). Toward a research instrument for the assessment of preterm infants' behavior (APIB).

In H. Fitzgerald, B. M. Lester, & M. W. Yogman (Eds.), *Theory and research in behavioral pediatrics* (pp. 35–63). New York, NY: Plenum Press.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

Anda, R. F., Felitti, V. J., Bremner, D., Walker, J. D., Whitfield, C., Perry, B. D., … Giles, W. H. (2006). The enduring effects of abuse and related adverse experiences in childhood: A convergence of evidence from neurobiology and epidemiology. *European Archives of Psychiatry and Clinical Neuroscience*, *4*(256), 174–186.

Ayres, A. J. (1972a). Improving academic scores through sensory integration. *Journal of Learning Disabilities*, *5*, 338–343.

Ayres, A. J. (1972b). *Sensory integration and learning disorders*. Los Angeles, CA: Western Psychological Services.

Bar-David, Y., Urkin, J., & Kozminsky, E. (2005). The effect of voluntary dehydration on cognitive functions of elementary school children. *Acta Paediatrica*, *94*(11), 1667–1673.

Barber, B. K., & Harmon, E. L. (2002). Violating the self: Parental psychological control of children and adolescents. In B. K. Barber (Ed.), *Intrusive parenting: How psychological control affects children and adolescents*. Washington, DC: American Psychological Association.

Bath, H. (2008). The three pillars of trauma-informed care. *Reclaiming Children and Youth*, *17*(3), 17–12.

Becker-Weidman, A. (2009). Effects of early maltreatment on development: A descriptive study using the Vineland Adaptive Behavior Scales-II. *Child Welfare*, *88*(2), 137–161.

Benton, D. (2007). The impact of diet on anti-social behavior. *Neuroscience & Biobehavior Reviews*, *31*, 752–774.

Benton, D., Brett, V., & Brain, P. F. (1987). Glucose improves attention and reaction to frustration in children. *Biological Psychology*, *24*(2), 95–100.

Benton, D., & Stevens, M. K. (2008). The influence of a glucose containing drink on the behavior of children in school. *Biological Psychology*, *78*(3), 242–245.

Bernieri, F. J., & Rosenthal, R. (1991). Interpersonal coordination: Behavior matching and interactional synchrony. In R. S. Feldman & B. Rimé (Eds.), *Fundamentals of nonverbal behavior* (pp. 401–432). New York, NY: Cambridge University Press.

Best, J. R. (2010). Effects of physical activity on children's executive function: Contributions of experimental research on aerobic exercise. *Developmental Review*, *30*(4), 331–351.

Booth, P. B., & Lindaman, S. L. (2000). Theraplay as short term treatment for enhancing attachment in adopted children. In H. G. Kaduson & C. E. Schaefer (Eds.), *Short term play therapy for children*. New York, NY: Guilford Press.

Bourre, J. M. (2004). Roles of unsaturated fatty acids (especially omega-3 fatty acids) in the brain at various ages and during aging. *Journal of Nutrition, Health, and Aging*, *8*, 163–174.

Brazelton, T. B., & Greenspan, S. I. (2000). *The irreducible needs of children: What every child must have to grow, learn, and flourish*. Cambridge, MA: Perseus Books Group.

Bremner, J. D. (2003). Long-term effects of childhood abuse on brain and neurobiology. *Child and Adolescent Psychiatric Clinics of North America*, *12*, 271–292.

Bronfenbrenner, U., & Morris, P. A. (1998). The ecology of developmental processes. In W. Damon & R. M. Lerner (Eds.), *Handbook of child psychology* (5th ed.). New York, NY: John Wiley & Sons.

Brown, S. (2009). *Play: How it shapes the brain, opens the imagination, and invigorates the soul*. New York, NY: Avery Trade.

Carrion, V. G. (2006). Understanding the effects of early life stress on brain development. In A. Lieberman & R. DeMartino (Eds.), *Interventions for children exposed to violence* (Vol. IV, pp. 45–64). New Brunswick, NJ: Johnson & Johnson Pediatric Institute.

Cassidy, J. (2001). Truth, lies, and intimacy: An attachment perspective. *Attachment and Human Development*, *3*(2), 121–155.

Cermak, S. (2009). Deprivation and sensory processing in institutionalized and postinstitutionalized children: Part 1. *Sensory Integration and Special Interest Section Quarterly*, *32*(2), 1–3.

Cermak, S., & Groza, V. (1998). Sensory processing problems in post-institutionalized children: Implications for social work. *Child and Adolescent Social Work Journal*, *15*(1), 5–36.

Cohen, J. A. (2005). Treating traumatized children: Current status and future directions. *Journal of Trauma & Dissociation*, *6*, 109–121.

Colvin, G., & Sugai, G. (1988). Proactive strategies for managing social behavior problems: An instructional approach. *Education and Treatment of Children*, *11*, 341–348.

Colvin, G., Sugai, G., & Patching, W. (1993). Precorrection: An instructional approach for managing predictable problem behaviors. *Intervention in School and Clinic*, *28*, 143–150.

Cook, A., Blaustein, M., Spinazolla, J., & van der Kolk, B. (2003). *Complex trauma in children and adolescents*. White paper from the National Child Traumatic Stress Network Complex Trauma Task Force. National Center for Child Traumatic Stress, Los Angeles, CA. Retrieved from http://www.nctsnet.org/nctsn_assets/pdfs/edu_materials/ComplexTrauma_All.pdf

Cowan, P. A., & Cowan, C. P. (2003). Normative family transitions, normal family processes, and healthy child development. In F. Walsh (Ed.), *Normal family processes: Growing diversity and complexity* (pp. 424–459). New York, NY: Guilford Press.

Crespo, C., Kielpikowski, M., Pryor, J., & Jose, P. E. (2011). Family rituals in New Zealand families: Links to family cohesion and adolescents' well-being. *Journal of Family Psychology*, *25*(2), 184–193.

Crowell, J. A., Treboux, D., & Waters, E. (2002). Stability of attachment representations: The transition to marriage. *Developmental Psychology*, *38*(4), 467–479.

Dagleish, T., Meiser-Stedman, R., & Smith, P. (2005). Cognitive aspects of posttraumatic stress reactions and their treatment in children and adolescents: An empirical review and some recommendations. *Behavioral and Cognitive Psychotherapy*, *33*, 459–486.

Danforth, J. S. (2006). Parent training for families of children with comorbid ADHD and ODD. *International Journal of Behavioral Consultation & Therapy*, *2*(1), 45–64.

DeGangi, G. A., Porges, S. W., Sickel, R. Z., & Greenspan, S. I. (1993). Four-year follow-up of a sample of regulatory disordered infants. *Infant Mental Health Journal*, *14*(4), 330–343.

Dorman, C., Lehsten, L. N., Woodin, M., Cohen, R. L., Schweitzer, J. A., & Tona, J. T. (2009). Using sensory tools for teens with behavioral and emotional problems. *OT Practice*, *14*(21), 16–21.

Dozier, M., Peloso, E., Lindhiem, O., Gordon, M. K., Manni, M., Sepulveda, S., … Levine, S. (2006). Developmental evidence-based interventions for foster children: An example of a randomized clinical trial with infants and toddlers. *Journal of Social Issues*, *62*(4), 767–785.

Dozier, M., Stovall, K. C., Albus, K. E., & Bates, B. (2001). Attachment for infants in foster care: The role of caregiver state of mind. *Child Development*, *72*(5), 1467–1477.

Edmonds, C. J., & Burford, D. (2009). Should children drink more water? The effects of drinking water on cognition in children. *Appetite*, *52*(3), 776–779.

Edmonds, C. J., & Jeffes, B. (2009). Does having a drink help you think? 6–7-year-old children show improvements in cognitive performance from baseline to test after having a drink of water. *Appetite*, *53*(3), 469–472.

Endsley, M. R. (2006). Expertise and situation awareness. In K. Anders Ericsson, N. Charness, P. J. Feltovich & R. R. Hoffman (Eds.), *The Cambridge handbook of expertise and expert performance* (pp. 633–651). New York, NY: Cambridge University Press.

Fazlioglu, Y., & Baran, G. (2008). A sensory integration therapy program on sensory problems for children with autism. *Perceptual and Motor Skills*, *106*, 415–422.

Fesperman, L., & Lindaman, S. L. (1998). Theraplay reaches difficult to engage children in foster care. *Bulletin of Zero to Three. National Center for Infants, Toddlers, and Families*, *19*(3), 34–35.

Field, T. (1995). Psychologically depressed parents. In M. H. Bornstein (Ed.), *Handbook of parenting* (Vol. 4, pp. 85–99). Mahwah, NJ: Erlbaum.

Field, T. M. (2003). *Touch*. New York, NY: Bradford Books.

Field, T. M., Greenwald, P., Morrow, C., Healy, B., Foster, T., Guthertz, M., … Frost, P. (1992). Behavior state matching during interactions of preadolescent friends versus acquaintances. *Developmental Psychology*, *28*(2), 242–250.

Field, T., Hernandez-Reif, M., & Diego, M. (2005). Cortisol decreases and serotonin and dopamine increase following massage therapy. *International Journal of Neuroscience*, *115*, 1397–1413.

Finset, A., & Del Piccolo, L. (2011). Nonverbal communication in clinical contexts. In M. Rimondini (Ed.), *Communication in cognitive behavioral therapy* (pp. 107–128). New York, NY: Springer Science and Business Media.

Fisher, P. A., Gunnar, M. R., Dozier, M., Bruce, J., & Pears, K. C. (2006). Effects of therapeutic interventions for foster children on behavioral problems, caregiver attachment, and stress regulatory neural systems. *Annals of New York Academy of Sciences*, *1094*, 215–225.

Gailliot, M. T., Baumeister, R. F., DeWall, C. N., Maner, J. K., Plant, E. A., Tice, D. M., … Schmeichel, B. M. (2007). Self-control relies on glucose as a limited energy

source: Willpower is more than a metaphor. *Journal of Personality and Social Psychology*, *92*(2), 325–336.

Galler, Bryce, Waber, Medford, Eaglesfield, & Fitzmaurice (2011). Early malnutrition predicts parent reports of externalizing behaviors at ages 9–17. *Nutritional Neuroscience*, *14*(4), 138–144.

Garland, M. R., & Hallahan, B. (2006). Essential fatty acids and their role in conditions characterised by impulsivity. *International Review of Psychiatry*, *18*(2), 99–105.

George, C., Kaplan, N., & Main, M. (1985). *Adult Attachment Interview*. Unpublished Manuscript. Berkeley, CA: University of California.

Geva, R., & Feldman, R. (2008). A neurobiological model for the effects of early brainstem functioning on the development of behavior and emotion regulation in infants: Implications for prenatal and perinatal risk. *Journal of Child Psychology and Psychiatry*, *49*(10), 1031–1041.

Grietens, H., & Hellinckx, W. (2003). Predicting disturbed parental awareness in mothers with a newborn infant: Test of a theoretical model. *Infant and Child Development*, *12*, 117–128.

Heimlich, J. E., & Ardoin, N. M. (2008). Understanding behavior to understand behavior change: A literature review. *Environmental Education Research*, *14*(3), 215–237.

Hester, P. P., Hendrickson, J. M., & Gable, R. A. (2009). Forty years later: The value of praise, ignoring, and rules for preschoolers at risk for behavior disorders. *Education and Treatment of Children*, *32*(4), 513–535.

Hoffman, K. T., Marvin, R. S., Cooper, G., & Powell, B. (2006). Changing toddlers' and preschoolers' attachment classifications: The circle of security intervention. *Journal of Consulting and Clinical Psychology*, *74*(6), 1017–1026.

Hohnke, C. D., & Sur, M. (1999). Development of the visual pathways: Effects of neural activity. *Mental Retardation and Developmental Disabilities Research Reviews*, *5*(1), 51–59.

Jernberg, A. M. (1984). Theraplay: Child therapy for attachment fostering. *Psychotherapy 21*(1), 39–47.

Jernberg, A. M., & Booth, P. B. (1999). *Theraplay: Helping parents and children build better relationships through attachment-based play* (2nd ed.). San Francisco, CA: Jossey-Bass.

Jonsson, C. O., Clinton, D. N., & Fahrman, M. (2001). How do mothers signal shared feeling-states to their infants? An investigation of affect attunement and imitation during the first year of life. *Scandinavian Journal of Psychology*, *42*, 377–381.

Kaplan, B. J., Crawford, S. G., Gardner, B., & Farrelly, G. (2002). Treatment of mood lability and explosive rage with minerals and vitamins: Two case studies in children. *Journal of Child and Adolescent Psychopharmacology*, *12*, 205–219.

Kaplan, B. J., Fisher, J. E., Crawford, S. G., Field, C. J., & Kolb, B. (2004). Improved mood and behavior during treatment with a mineral-vitamin supplement: A open-label case series of children. *Journal of Child and Adolescent Psychopharmacology*, *14*, 115–122.

Katz, D. L., Cushman, D., Reynolds, J., Njike, V., Treu, J. A., Katz, C., … Smith, E. (2010). Putting physical activity where it fits in the school day: Preliminary

results of the ABC (activity bursts in the classroom) for fitness program. *Preventing Chronic Disease*, *7*(4), A82.

Kemmis, B., & Dunn, W. (1996). Collaborative consultation: The efficacy of remedial and contemporary interventions in school contexts. *American Journal of Occupational Therapy*, *50*(9), 709–717.

Kinniburgh, K., Blaustein, M., Spinazzola, J., & van der Kolk, B. (2005). Attachment, self-regulation, and competency: A comprehensive framework for intervention with childhood complex trauma. *Psychiatric Annals*, *35*(5), 424–430.

Knight, D. C., Smith, C. N., Cheng, D. T., Stein, E. A., & Helmstetter, F. J. (2004). Amygdala and hippocampal activity during acquisition and extinction of human fear conditioning. *Cognitive, Affective, and Behavioral Neuroscience*, *4*(3), 317–325.

Kranowitz, C. (2006). *The out-of-sync child: Recognizing and coping with sensory processing disorder* (rev. ed.). New York, NY: Penguin Putnam.

Lee, B., & Perales, K. (2005). Circle of courage: Reaching youth in residential care. *Residential Treatment for Children & Youth*, *22*(4), 1–14.

Lickliter, R. (2008). Theories of attachment: The long and winding road to an integrative developmental science. *Integrative Psychological & Behavioral Science*, *42*, 397–405.

Lindaman, S. (1996). Theraplay for adopted children. *Adoption Therapist*, *7*(1), 5–8.

Lochman, J. E., Powell, N. R., & Whidby, J. M. (2006). Aggressive children: Cognitive behaviorial assessment and treatment. In P. C. Kendall (Ed.), *Child and adolescent therapy: Cognitive-behavioral procedures* (3rd ed., pp. 33–81). New York, NY: Guilford Press.

Madigan, S., Moran, G., Schuengel, C., Pederson, D. R., & Otten, R. (2007). Unresolved maternal attachment representations, disrupted maternal behavior and disorganized attachment in infancy: Links to toddler behavior problems. *Journal of Child Psychology and Psychiatry*, *48*(10), 1042–1050.

Mahoney, G. (2009). Relationship focused intervention (RFI): Enhancing the role of parents in children's developmental intervention. *International Journal of Early Childhood Special Education*, *1*(1), 79–94.

Malloch, S., & Trevarhen, C. (2010). *Communicative musicality: Exploring the basis of human companionship*. New York, NY: Oxford University Press.

Miller, L. J., & Fuller, D. A. (2007). *Sensational kids: Hope and help for children with sensory processing disorder*. New York, NY: Perigree Trade.

Mills, R. S. L., & Rubin, K. H. (1998). Are behavioral and psychological control both differentially associated with childhood aggression and social withdrawal? *Canadian Journal of Behavioral Science*, *30*(2), 132–136.

Miltenburg, R., & Singer, E. (1999). Culturally mediated learning and the development of self-regulation by survivors of child abuse: A Vygotskian approach to the support of survivors of child abuse. *Human Development*, *42*(1), 1–17.

Mindell, J. A., Owens, J., Alves, R., Bruni, O., Goh, D. Y. T., Hiscock, H., . . . Sadeh, A. (2011). Give children and adolescents the gift of a good night's sleep: A call to action. *Sleep Medicine*, *12*(3), 203–204.

Montagu, A. (1986). *Touching: The human significance of the skin*. New York, NY: Harper.

Nelson, C. A. (2011). Neural development and lifelong plasticity. In D. P. Keating (Ed.), *Nature and nurture in early child development* (pp. 45–69). New York, NY: Cambridge University Press.

Nicolopoulou, A., Barbosa de Sa', A., Ilgaz, H., & Brockmeyer, C. (2010). Using the transformative power of play to educate hearts and minds: From Vygotsky to Vivian Paley and beyond. *Mind, Culture, and Activity*, *17*, 42–58.

Niklasson, M., Niklasson, I., & Norlander, T. (2010). Sensorimotor therapy: Physical and psychological regressions contribute to an improved kinesthetic and vestibular capacity in children and adolescents with motor difficulties and concentration problems. *Social Behavior and Personality*, *38*(3), 327–346.

Novak, T., Scanlan, J., McCaul, D., MacDonald, N., & Clarke, T. (2012). Pilot study of a sensory room in an acute inpatient psychiatric unit. *Australasian Psychiatry, 20*(5), 401–406.

Panksepp, J. (2000). The riddle of laughter: Neural and psychoevolutionary underpinnings of joy. *Current Directions in Psychological Science*, *9*, 183–186.

Panksepp, J. (2002). On the animalian values of the human spirit: The foundational role of affect in psychotherapy and the evolution of consciousness. *Journal of Psychotherapy, Counselling and Health*, *5*, 225–245.

Parham, L. D. (1998). The relationship of sensory integrative development to achievement in elementary students: Four-year longitudinal patterns. *The Occupational Therapy Journal of Research*, *18*(3), 105–127.

Peck, H. L., Kehle, T. J., Bray, M. A., & Theodore, L. A. (2005). Yoga as an intervention for children with attention problems. *School Psychology Review*, *34*(3), 415–424.

Pecora, P. J., White, C. R., Jackson, L. J., & Wiggins, T. (2009). Mental health of current and former recipients of foster care: A review of recent studies in the USA. *Child and Family Social Work*, *14*, 132–146.

Pennebaker, J. W., & Stone, L. D. (2004). Translating traumatic experiences into language: Implications for child abuse and long-term health. In L. J. Koenig, L. S. Doll, A. O'Leary, & W. Pequegnat (Eds.), *From child sexual abuse to adult sexual risk: Trauma, revictimization, and intervention* (pp. 201–216). Washington, DC: American Psychological Association.

Perry, B. D. (1994). Neurobiological sequelae of childhood trauma: Post-traumatic stress disorders in children. In M. Murburg (Ed.), *Catecholamine function in post-traumatic stress disorder: Emerging concepts* (pp. 253–276). Washington, DC: American Psychiatric Press.

Perry, B. D. (2001). The neurodevelopmental impact of violence in childhood. In D. Schetky & E. P., Benedek (Eds.), *Textbook of child and adolescent forensic psychiatry* (pp. 221–238). Washington, DC: American Psychiatric Press.

Perry, B. D. (2009). Examining child maltreatment through a neurodevelopmental lens: Clinical applications of the neurosequential model of therapeutics. *Journal of Loss and Trauma*, *14*, 240–255.

Pollitt, E. (1988). A critical view of three decades of research on the effect of chronic energy malnutrition on behavior development. In B. Schurch & N. Scrimshaw (Eds.), *Chronic energy deficiency: Consequences and related issues*. Lausanne, Switzerland: IDECG-Nestle Foundation.

Powell, C., & Grantham-McGregor, S. (1985). The ecology of nutritional status and development in young children in Kingston Jamaica. *American Journal of Clinical Nutrition*, *41*, 1322–1331.

Purvis, K. B., & Cross, D. R. (2006). Improvements in salivary cortisol, depression, and representations of family relationships in at-risk adopted children utilizing a short-term therapeutic intervention. *Adoption Quarterly*, *10*(1), 25–43.

Purvis, K. B., & Cross, D. R. (2007). Facilitating behavioral change in adopted children suffering from sensory processing disorder. In T. C. Atwood, L. A. Allen, V. C. Ravenel & N. F. Callahan (Eds.), *Adoption factbook IV* (pp. 375–379). Washington, DC: National Council for Adoption.

Purvis, K. B., Cross, D. R., Federici, R., Johnson, D., & McKenzie, L. B. (2007). The hope connection: A therapeutic summer camp for adopted and at-risk children with special socio-emotional needs. *Adoption & Fostering*, *31*, 38–48.

Purvis, K. B., Cross, D. R., & Pennings, J. S. (2009). Trust-Based Relational Intervention™: Interactive principles for adopted children with special social-emotional needs. *Journal of Humanistic Counseling, Education, and Development*, *48*, 3–48.

Purvis, K. B., Cross, D. R., & Sunshine, W. L. (2007). *The connected child: Bring hope and healing to your adoptive family*. New York, NY: McGraw-Hill.

Purvis, K. B., McKenzie, L. B., & Cross, D. R. (2012). *A spontaneous emergence of attachment behavior and a correlation with sensory deficits: A brief report*. Manuscript submitted for publication.

Raine, A. (2002). Annotation: The role of prefrontal deficits, low autonomic arousal, and early health factors in the development of antisocial and aggressive behavior in children. *Journal of Child Psychology and Psychiatry*, *43*(4), 417–434.

Reed, E. S. (1996). *The necessity of experience*. New Haven, CT: Yale University Press.

Robison, M., Lindaman, S. L., Clemons, M. P., Doyle-Buckwalter, K., & Ryan, M. (2009). "I deserve a family": The evolution of an adolescent's behavior and beliefs about himself and others when treated with Theraplay in residential care. *Child & Adolescent Social Work Journal*, *26*(4), 291–306.

Sainato, D. M. (1990). Classroom transitions: Organizing environments to promote independent performance in preschool children with disabilities. *Education & Treatment of Children*, *13*(4), 288–297.

Schore, A. N. (1994). *Affect regulation and the development of self: The neurobiology of emotional development*. Hillsdale, NJ: Erlbaum.

Schore, A. N. (2001). Effects of a secure attachment relationship on right brain development, affect regulation, and infant mental health. *Infant Mental Health Journal*, *22*(1–2), 7–66.

Siegel, D. J. (1999). *The developing mind*. New York, NY: Guilford.

Stark, K. D., Sander, J., & Hauser, M. (2006). Depressive disorders during childhood and adolescence. In E. J. Mash & R. A. Barkley (Eds.), *Treatment of childhood disorders* (3rd ed., pp. 336–407). New York, NY: Guilford Press.

Steele, M., Hodges, J., Kaniuk, J., Hillman, S., & Henderson, K. (2003). Attachment representations and adoption: Associations between maternal states of mind and emotion narratives in previously maltreated children. *Journal of Child Psychotherapy*, *29*(2), 187–205.

Steele, M., Hodges, J., Kaniuk, J., Steele, H., Asquith, K., & Hillman, S. (2009). Attachment representations and adoption outcome: On the use of narrative assessments to track the adaptation of previously maltreated children in their new families. In G. Wrobel & E. Neil (Eds.), *International advances in adoption research for practice* (pp. 193–215). New York, NY: Wiley-Blackwell.

Steele, H., Steele, M., & Fonagy, P. (1996). Associations among attachment classifications of mothers, fathers, and their infants. *Child Development*, *67*(2), 541–555.

Stueck, M., & Gloeckner, N. (2005). Yoga for children in the mirror of the science: Working spectrum and practice fields of the training of relaxation with elements of yoga for children. *Early Child Development and Care*, *175*(4), 371–377.

Sukhodolsky, D. G., Kassinove, H., & Gorman, B. S. (2004). Cognitive-behavioral therapy for anger in children and adolescents: A meta-analysis. *Aggression and Violent Behavior*, *9*, 247–269.

Uauy, R., & Dangour, A. D. (2006). Nutrition in brain development and aging: Role of essential fatty acids. *Nutrition Reviews*, *64*(5), 24–33.

van der Kolk, B. A. (2005). Developmental trauma disorder: Toward a rational diagnosis for children with complex trauma histories. *Psychiatric Annals*, *35*(5), 401–408.

van der Kolk, B. A., & Courtois, C. A. (2005). Editorial comments: Complex developmental trauma. *Journal of Traumatic Stress*, *18*, 385–388.

Verdeli, H., Mufson, L., & Lee, L. (2006). Review of evidence-based psychotherapies for pediatric mood and anxiety disorders. *Current Psychiatry Reviews*, *2*, 395–421.

Verhulst, F. C. (2000). Internationally adopted children: The Dutch longitudinal adoption study. *Adoption Quarterly*, *4*(1), 27–44.

Walsh, W. J., Glab, L. B., & Haakenson, M. L. (2004). Reduced violent behavior following biochemical therapy. *Physiology and Behavior*, *82*, 835–839.

Ward, M. J., Lee, S. S., & Lipper, E. G. (2000). Failure-to-thrive is associated with disorganized infant–mother attachment and unresolved maternal attachment. *Infant Mental Health Journal*, *21*(6), 428–442.

Webster-Stratton, C., & Hammond, M. (1997). Treating children with early-onset conduct problems: A comparison of child and parent training interventions. *Journal of Consulting and Clinical Psychology*, *65*(1), 93–109.

Wilson, M. M., & Morley, J. E. (2003). Impaired cognitive function and mental performance in mild dehydration. *European Journal of Clinical Nutrition*, *57*, S24–S29.

APPENDIX

Trust-Based Relational Intervention® (TBRI®)
Abbreviated Intensive Program Activity List

Empowering principles – ecological and physiological concerns

*Support more primitive systems so that the child can function at higher cognitive and emotional levels.

- Snack or meal every two hours
- Sensory integration activity every two hours
- Provide consistent rituals and routines (e.g., morning & bedtime rituals)

Connecting principles – building trust and meeting relational needs
*Giving care, seeking care, negotiating needs, being autonomous self

- Affectionate activities (reading, snuggling, talking, walks, crafts, etc.)
- Family time – "No hurts, stick together, have fun"
- Playful engagement with child

Correcting principles – teaching children to be self-managers
*Proactive strategies

- Script practice
  - Gentle & kind
  - Showing respect
  - Listen & obey
  - Cooperate & compromise
  - Consequences
  - Permission & supervision
  - Rules for finding safe people
- Role rehearsal (using a partner or puppets)
- Reading goal chart (at meals and bedtime)
- Mutual story-telling (discussing appropriate responses and behaviors)
- Memory book assignments
- Compliance games
- Relaxation practice
- "Checking engines" (emotional self-check)

Common Challenges
Transitions between activities, taking items without permission, taking turns, explosive jealousy, aggression when told "no", environments that are over-stimulating, & unstructured situations.

*At the beginning of the TBRI® program, correcting activities are practiced multiple times during the day. As the child's behavior improves, time spent engaged in correcting activities can be reduced.