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Expressive Therapy with Severely Maltreated Children: Neuroscience Contributions

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Abstract

Recent developments in neuroscience provide important information for therapists working with maltreated children. Severe maltreatment and lack of significant attachment figures in the crucial early years lead to adverse brain development (De Bellis, 2001). It appears evident that traumatic memories are stored in the right hemisphere, making verbal declarative memory of the trauma more difficult (Schiffer, Teicher, & Papanicolaou, 1995). This research lays the groundwork for understanding why nonverbal, expressive therapies can be more effective than verbal therapies in work with severely maltreated children exhibiting attachment difficulties. This article explores current research in neuroscience and provides a rationale for expressive therapy as a treatment intervention for this population.

Introduction: Definition of Terms

Defining severe maltreatment is not an easy task. When a call to a child-abuse hotline is made, the suspicion that a child is being or has been abused is reported. To be substantiated, there must be physical evidence, reliable witnesses, or disclosure by the child. If the hotline call is substantiated and the child is referred for treatment, the treatment focus may need to go much deeper than the initial signs of abuse that brought the child to the attention of the authorities. For example, Erin's black eye, which initiated an investigation, will heal, but it is nothing compared to the emotional effects of Erin not being fed and being forced to sleep on the floor of a closet amid urine-soaked clothes, waiting for someone to unlock the door of her imprisonment. Erin isn't going to readily talk about this. Children rarely talk about experiencing severe maltreatment, especially when inflicted by the person on whom they must rely for their basic needs. Much more often, we see children protecting the abusive parent and longing to return home if placed in a foster home. Erin isn't talking; she cries for her mother. When a child isn't talking, ascertaining that a child has been severely maltreated is difficult.

In a special issue of *Child Maltreatment* (Haugaard, 2004), severely maltreated children are defined as those who display behaviors suggesting severe disturbance—even if their reported maltreatment does not seem severe—because the extent of what these children have experienced may be completely unknown. This definition also includes those children who have experienced forms of maltreatment that are likely to result in severe disturbance—even if that disturbance is not evident behaviorally—because research shows that consequences may emerge later. Severe maltreatment can be characterized as chronic and involving considerable pain; it is also physically invasive or causes the child to fear death or permanent injury (Haugaard, 2004; Saywitz, Mannarino, Berliner, & Cohen, 2000).

Identifying attachment problems is also difficult. According to the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (1994), the criteria for a diagnosis of reactive attachment disorder (RAD) include evidence of pathogenic care and persistent disregard of the child's basic physical or emotional needs. Also included is evidence of disturbed and developmentally inappropriate social relatedness beginning before 5 years of age. The inhibited type of RAD is described as a failure to initiate or respond appropriately in social interactions, and the disinhibited type is characterized by a failure or inability to discriminate in social interactions (*DSM-IV,* 1994). As with defining severe maltreatment, evidence of pathogenic care prior to age 5 may be difficult to obtain because often the child's history is unknown (Hanson, 2002; Hanson & Spratt, 2000).

For the sake of this paper, attachment difficulties will include the entire range of attachment problems—not just the RAD diagnosis—because children are so often misdiagnosed; the diagnosis can and often does change throughout the course of treatment. Behavior patterns of poorly attached children include demonstrations of indiscriminate relationships and a lack of joy, humor, reciprocal enjoyment, eye contact, empathy, guilt, remorse, appropriate communication, and appropriate physical boundaries (Hughes, 1998).

Normal Brain Development

Before looking at what happens to the brain in situations of long-term exposure to trauma, it is useful to see what happens in normal brain development. The human brain during the early years of life is dependent upon both genetic information and proper external stimulation after birth. During the first 2 years, the basic circuits of the brain

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are being established (Balbernie, 2001; De Bellis, 2001; Schore, 2002). Neuroplasticity is the brain's ability to change its structure in response to environmental stimuli. When a baby is born, about 100 billion neurons are present in the brain, although they are not all functioning. Those that aren't used become disabled, and those that become part of neuropathways thrive. A synapse is the junction across which an electrical impulse passes between neurons creating neuropathways. When a neuropathway is stimulated, all the synapses become engaged and store a chemical pattern, which if repeated, becomes strong enough that it forms a permanent circuit (Balbernie, 2001). The child's brain develops in a "use-dependent" fashion, meaning that the more any neural system is activated, the more likely it is to become permanent (Perry, Pollard, Blakley, Baker, & Vigilante, 1995).

There are crucial windows of opportunity for development of certain parts of the brain; if they are not activated, they wither. Other areas may be amenable to rewiring later, after the crucial period has passed. Balbernie (2001) writes:

> The regions of the cortex that play an operational part in hearing and sight can be permanently compromised if some biological, or even social, condition has deprived them of normal input early on in life. The neural circuits for language and emotion retain…plasticity for most of childhood. (p. 241)

For example, when an infant is spoken to, the neural system responsible for speech and language is activated, which helps the child to develop the capacity for language. By contrast, when a child is in an environment where he or she is not spoken to, language will develop more slowly, and there will be communication delays because the appropriate parts of the brain were not stimulated at a crucial developmental stage (Perry, 2001).

As a result of animal and human studies, the relationship between external stimulation and the development of the brain is increasingly recognized as being reciprocal. Studies have shown that when a kitten's eye is artificially closed at birth, the kitten does not develop sight in that eye. When researchers subsequently looked at the kitten's brain to study the area that governs sight, it was found to be underdeveloped (Baer & Rittenhouse, 1999; Wiesel & Hubel, 1963, 1965).

Schore (2001) postulates that the emotional communications of the attachment between primary caregiver and infant directly impact the experience-dependent maturation of the infant's developing brain. Those neuropathways that are reinforced in the baby's brain are selected by the quality and content of the emotional surroundings within the attachment relationship (Balbernie, 2001). The mother-child bond is crucial to both psychological and physiological development. To enter into the bond, the mother must be psychobiologically attuned to the infant. During play episodes, mother and child show sympathetic cardiac acceleration and then parasympathetic deceleration in response to the smile of the other. Each partner in this dyad learns the rhythmic structure of the other. In moments of affect synchrony, the pair is in affective resonance and is like a biological unit. After moments of stress for the child, the mother invokes a reattunment, which helps to regulate the child's negative state. When the child is living in a secure environment, the maternal interactions act as an external organizer of the child's biobehavioral regulation (Schore, 2002). This maternal or caretaker's stimulation helps the developing brain reach its potential.

Research shows that the right brain is dominant in human infants until the age of 3. This is confirmed by positron emission tomography (PET) scans showing changes in cerebral blood flow measured at rest. The developmental changes appear to follow the emergence of functions localized initially on the right hemisphere (visuospatial) and later on the left hemisphere (language abilities) (Chiron et al., 1997). This research supports Schore's (2001) notion that the right hemisphere stores an internal working model of the initial attachment relationship that assists the child in developing strategies of affect regulation for coping and survival. Mahler (1979) talked about the child in rapprochement learning to tolerate the stress of the mother's absence through experimenting with leaving. The securely attached child learns to self-regulate the stress associated with separations that previously required the mother's physical presence and external regulation. This happens as a result of practicing, as Mahler noted; however, new research shows that it is also a result of neurophysiological development. The early relationship helps to stimulate the connections in the brain that form the neuropathways for growth.

Brain Development in Poorly Attached or Traumatized Children

Neuropsychiatrists today are providing solid scientific evidence of theories developed 30 years ago by Bowlby (1969) and Mahler (Mahler, Pine, & Bergman, 1975) regarding attachment theory and object relations. According to Schore (2002), traumatic attachment histories affect the development of frontolimbic regions of the brain, especially the right cortical areas that are prospectively involved in affect-regulating functions. Evidence shows that early relational trauma is expressed in right-brain deficits in the processing of social, emotional, and bodily information. If the optimal conditions for brain development include a secure attachment figure who provides external stimulation and emotional connections, what happens when the child is raised in an environment where this is lacking? Unfortunately, there have been opportunities to examine this through studies of Romanian orphans.

In the 1980s, a number of Romanian orphans who were adopted in this country and the United Kingdom began exhibiting serious behavior, cognitive, and attachment problems. One report stated that over 100,000 children throughout Romania were warehoused in orphanages with minimal food, heat, or clothing and with few caregivers (Kaler & Freeman, 1994). The staff at these orphanages did not provide appropriate stimulation and personal attention, even during activities that would normally involve contact such as feeding. Instead of being held, chil-

dren were propped up in their beds with their bottles (Beckett et al., 2002). Loving adoptive families who believed that a change in the child's environment would be all that was needed were frequently surprised to find that the behaviors and the remedies were much more complex. Behaviors associated with institutional experience and duration were noted in a study of 144 of these children and fell into three basic categories: inattention-overactivity, attachment difficulties, and quasi-autistic behavior. Specific behaviors included rocking patterns, difficulties with chewing and swallowing, self-injury, and unusual sensory interests (Beckett et al.).

A longitudinal study of Romanian orphans, adopted at ages ranging from infancy to 3½ years and then followed up at 4 and 6 years, revealed a close association between duration of deprivation and severity of attachment-disorder behaviors, which were correlated with attention and conduct problems and cognitive level. There was no evidence of a decrease in attachment-disorder behavior over a 2-year period (O'Connor, Rutter, & English and Romanian Adoptees Study Team, 2000). The researchers found that these problems were not related to nutritional deprivation. Half of the total group of Romanian adoptees weighed below the 3rd percentile for children of their age at the time of adoption, but most attained near-normal or normal weight by the age of 6. Head circumference was a different matter (Rutter & O'Connor, 2004). Even for those without severe malnutrition at the time of adoption, head circumference at age 6 was still about 1½ standard deviations below the general population mean. With respect to cognitive impairments, this study found that associations with subnutrition and a small head circumference point to the likelihood of abnormal brain development because brain growth largely determines head size.

Rutter and O'Connor (2004) provided several hypotheses, among them that an institutional environment such as a Romanian orphanage falls outside the range of what is necessary for normal brain development with respect to the neural systems underlying social relationships. They further point out that when numerous caregivers come and go and cannot be relied upon for relationship and interaction, it may be adaptive for children to seek interactions in a nonselective way.

Chugani et al. (2002) applied functional neuroimaging with PET scans to a group of adopted Romanian children. The 10 children, all over the age of 6, had been placed in orphanages at approximately 4 to 6 weeks of age and resided there for a mean of 38 months before being adopted by U.S. families. The neuropsychological assessment showed the adoptees had mild neurocognitive impairment, impulsivity, and attention and social deficits. Distinct abnormalities were found in various areas of the brain connected with emotion (Davies, 2002), and deficits in language processing, memory, and executive functioning were also found, suggesting that the stress of early global deprivation is involved in long-term cognitive and behavioral deficits (Chugani et al.).

Perry (1997) discovered that a lack of sensory-motor and cognitive experiences in a child's early years leads to underdevelopment of the cortex. The cortical and subcortical areas of the brain are smaller in individuals who have suffered "global environmental neglect" or who were rarely touched, spoken to, or allowed to play with toys as children. Perry did brain imaging studies and found "cortical atrophy" in 7 out of 12 of these children. He discovered that these areas of the cortex were underused, resulting in profound underdevelopment of those areas of the brain that assist in inhibiting, modulating, and regulating the functioning of the lower parts of the central nervous system.

Others who have found that the overwhelming stress of child maltreatment is associated with adverse brain development support Perry's work. Using Magnetic Resonance Imaging (MRI) technology, brain development in medically healthy, clinically referred children with chronic posttraumatic stress disorder (PTSD) was compared with brain development in nontraumatized healthy controls who were case matched for age, handedness, gender, height, weight, and race (De Bellis, 2001; De Bellis et al., 1999). This group of maltreated children had smaller intracranial volumes than did the nonabused controls. PTSD cluster symptoms of intrusive thoughts, avoidance, hyperarousal, or dissociation correlated negatively with intracranial volume. This study suggests that there are neurobiological consequences of trauma. The earlier during childhood the abuse occurs, the more severe the effects on intracranial volumes. Additionally, a negative correlation of intracranial volumes with abuse duration suggests that childhood maltreatment may have a cumulative effect on adverse aspects of brain development.

Bremner's (2001) work focuses on how changes in brain structures and systems mediating memory may offer reasons for delayed recall of child abuse in patients with abuse-related PTSD. Through his study of both Vietnam veterans and abuse victims, he found that patients with PTSD show changes in structure and function in brain regions mediating memory, including the hippocampus and medial prefrontal cortex as well as brain chemical systems involved in the stress response and retrieval of memories. To test the hypothesis that traumatic stress results in hippocampal damage in abuse victims, he used MRI scans to quantify hippocampal volume in survivors of child abuse diagnosed with PTSD as compared to healthy controls. There was a 12% reduction in left hippocampal volume in patients with abuse-related PTSD in comparison to the control group. Bremner and his colleagues hypothesized that atrophy and dysfunction of the hippocampus following exposure to child abuse leads to distortion and fragmentation of memories. Hence, the difficulty for these patients to talk about the abuse may be at least partially a function of changes in brain structures.

Early trauma affects the developing child throughout life. Studies of Vietnam veterans with PTSD support the notion that child abuse may predispose veterans to combat-related PTSD (Bremner, Southwick, Johnson, Yehuda, & Charney, 1993). A later study found that insecure attachment style was an even stronger predictor of PTSD in prisoners of war than was trauma severity (Dieperink, Leskela, Thuras, & Engdahl, 2001). A question arises as to whether

smaller hippocampal volume in individuals with PTSD represents a preexisting condition that makes the brain more vulnerable to stress or whether early childhood trauma causes smaller hippocampal volume. A study of twin pairs explored this issue with inconclusive results. Differences in hippocampal volume were compared between combat-exposed Vietnam veterans (some with and some without PTSD) and their twins with no combat exposure. Smaller hippocampal volume was found in both trauma-exposed veterans with severe PTSD and their twin brothers. What was impossible to decipher was whether this represented heredity or shared environment. Although a preexisting, familial vulnerability seemed likely, there was a nonsignificant trend for this group to share higher rates of childhood abuse (Gilbertson et al., 2002). It appears that most studies do not infer a causal relationship between posttraumatic stress and hippocampal volume (Marko & Merckelbach, 2004). More studies in this area are needed.

Hemispheric Aspects of How Trauma Is Stored in the Brain

Studies of the brain help us to understand how traumatic memories are stored. Schiffer et al. (1995) measured hemispheric activity of the brain in subjects with a history of trauma while they thought about a neutral, work-related memory and then an unpleasant early memory. The responses were compared with a control group (no known trauma) in which participants recalled a neutral work-related situation. The trauma group showed significant left-dominant asymmetry during the neutral memory that shifted markedly to the right during the unpleasant memory. The implications of this research are that traumatic memories may be stored in the right cerebral hemisphere, which would make verbal declarative memory of the trauma more difficult.

Further work by Schiffer (2000) suggested that the two hemispheres of the brain can have distinct personalities, memories, and perspectives. His review of the split-brain studies and his own experiments with lateral visual stimulation in patients with trauma histories have indicated that the "immature side maintains a perspective very similar and consistent with that which a child in troubled circumstances might be expected to experience" (p. 98). In a sense, Schiffer was proposing that the traumatized child maintains those feelings and perspectives in one half of the brain while the other half matures. Finding access to that troubled side may be instrumental in healing.

Other studies have shown that exposure to violence or trauma alters the developing brain by altering neurodevelopmental processes. Rauch et al. (1996) used PET scans to study patients suffering from PTSD. When presented with vivid accounts of their traumatic experiences, these individuals showed autonomic arousal; there was a concomitant heightened activity in their right amygdala and associated areas of the temporal and frontal cortex as well as in the right visual cortex. At the same time, the area concerned with language in the left hemisphere was "turned off." This suggests that the tendency of PTSD patients to reexperience emotions as physical states rather than as declarative verbal memories has a neurobiological explanation (Glaser, 2000; Rauch et al.).

According to Munns (2000), the right hemisphere controls sensorimotor perception and integration, processes social-emotional input, and is dominant in the first 3 years of life. Memories of the trauma and poor attachment experiences in the early years are processed in the right side of the brain. Munns stated:

> This suggests that since these experiences are processed and stored in a part of the brain that is preverbal or nonverbal, it makes sense to pay more attention to nonverbal methods of treatment (Schore, 1998) such as Theraplay, sandplay therapy, dance and movement therapy, touch therapy, eye movement therapy, nondirective play therapy, and others. (p. 13)

Clinical Implications

Unfortunately, one doesn't have to go to a Romanian orphanage or find Vietnam veterans to study the effects of long-term trauma. The trauma histories of some children in the foster care system in the United States are akin to torture. Unlike the Romanian orphans who were abandoned and neglected, these are children who have been maltreated by those who are supposed to be their significant attachment figures—parents, grandparents, and guardians. Not only is there a lack of attunement with the attachment figure, the very person whom the child must rely upon for safety is the person the child fears most. Although some children with trauma histories have a compulsion to tell their story, many more do not. Those for whom the abuse has gone on for a long time often *cannot*.

How can we understand and treat these clients more effectively in light of these new developments in neuropsychiatry? What does this research tell us clinically? After 25 years working with severely maltreated children, I have come to believe that nonverbal, expressive therapy approaches are highly effective interventions for this population because they do not rely on the client's use of the left brain and language for processing. Now, neuroscientists are helping therapists like myself understand why this is so. This understanding comes after many years of dutifully writing treatment goals that included talking about the abuse only to discover that this goal was rarely met with children who have had long-term exposure to severe maltreatment. According to Schiffer et al. (1995):

> Previous reports have suggested that early abuse may be associated with enduring neurobiological effects…. Early trauma may lead to a lack of integration of left-right hemisphere function, and we further speculate that traumatic memories may be preferentially stored in the right hemisphere. This hypothesis of deficient hemispheric integration and preferential right-sided storage of traumatic memories provides an interesting theoretical explanation for the fact that memory recollection following trauma can be both deficient (constricted or amnestic and intrusive. (p. 174)

In children with histories of severe maltreatment and attachment difficulties, one has to wonder whether the child ever has full access to the memories of trauma. Safety of the child is paramount, so pressing for disclosure to help substantiate an abuse allegation and provide a safety plan may be crucially important in the early stages. Once the child is protected from further abuse, pressing the child to talk may be counterproductive and countertherapeutic. This does not mean that the child should not be given an opportunity to approach and work through the traumatic issues. It makes sense to help the child make use of right-brain functions where the trauma memories are stored to express and work through issues of severe maltreatment in a way that supports the child's cognitive, developmental, and emotional levels. Two case vignettes illustrate this point.

Peter

Seven-year-old Peter was removed from his mother's home because of inappropriate discipline that included spraying her children with pepper mace and locking them in dog cages for many hours at a time. The children were also witnesses and participants in multiple types of incestuous behavior. Peter vehemently denied any abuse throughout several years of therapy. His art, however, revealed a different perception of the world and his home life. At his first art therapy session, he was told that he could draw anything he wanted. "Anything?" he asked incredulously. After repeated assurances, he said, "Can I draw the vampire that kills my mom?"

Peter's medium of choice was sculpture; he responded to the tactile nature of found objects and materials and manipulated them into structures that defined a world much different from the one he projected consciously. One day he created a holiday living room scene, a diorama made from a cardboard box. He carefully added a braided rug, which he made from yarn, drew little pictures to hang on the walls, and created a festively decorated Christmas tree in the corner of the room. He then added a chain to the tree and attached it to the walls of the room "so nobody can just come in and steal the tree." To the outside of the house, he added scores of toothpicks protruding out of the exterior walls in a way that appeared both aggressive and defensive. This, too, appeared to be a way to protect the tree inside the house. For a child such as Peter, articulating the pain of living in his own home was impossible. Many Christmases had been "stolen" from him, so using these visual metaphors appeared to be a way that he could satisfy the memories in the brain—both the part he was willing to talk about and the part that he couldn't.

Tammy

The second case involves a child able to work through an incredibly complex array of maltreatment and attachment issues without ever having to talk about them. Unfortunately, Tammy's social history is not unlike that of many children in state custody. She entered the foster care system and therapy at age 4 when she was removed from her mother's care due to severe abuse and neglect. During the subsequent 3 years of therapy with her, Tammy was placed in three different foster homes, one residential treatment center, and four daycare centers; she had a succession of three social workers. I was the only consistent person in her life in the role of her therapist. Complaints from her various foster mothers included that she sexually acted out, was physically aggressive with other children, and could not bond. Her diagnoses at age 4 were adjustment disorder with depressed mood and reactive attachment disorder (*DSM-IV,* 1994).

Throughout her 3 years of therapy, Tammy was never able to talk about the abuse she endured while in her mother's care. In fact, like many children in foster care, she cried often because she longed for her mother. Talking about the bad things her mother did would have been a betrayal that she simply could not do. Tammy had been abused over a long period during which much of the abuse likely occurred at the preverbal stage of development. Hence, many of her memories could not have had words associated with them but rather were stored in nonverbal parts of the brain as physical and emotional sensations.

Tammy's therapy went through many stages over the course of 3 years. (For a more detailed account of Tammy's story, refer to *Expressive Therapy with Troubled Children,* Klorer, 2000.) After about 2 years of therapy, her mother's rights were terminated due to lack of follow through on court orders, frequent incarcerations, drug use, and apparent lack of interest in even visiting her daughter. Tammy was then moved into a preadoptive foster home. Her ambivalence about attaching was played out with this family, as it played out in all her relationships. When her foster parents disappointed her or set a limit for her, she cried inconsolably for her mother. The word "no" when said to her meant dissolution of all love in her eyes, and she would become distraught, tearful, and withdrawn. She wanted a family yet struggled with attaching to this family because she still longed for her mother. She was adamant that she did not want to get adopted because she was sure her mother was going to stop using drugs and come get her.

Two pieces of art stand out as being representative of the intensity of the work Tammy was doing surrounding her attachment issues. She could not possibly articulate the meaning of these pieces. One day she announced that she wanted to make a sculpture of "a sister" in art therapy. Tammy had no sister in either her biological or in her preadoptive family. The idea came up several times, and each time she would gather materials to reserve for this project. However, she did not actually begin assembling it until about 4 months after the idea emerged. When she was finally ready to begin the project, she pulled out the Styrofoam, cardboard boxes, doll hair, and other items she had reserved, and over the course of several weeks she constructed a life-sized doll. I had no idea of the importance of this doll until her foster mother called to tell me what transpired once Tammy brought the doll home. She named her doll "Tina," and had this "sister" take on the roles that she could not for fear of betraying her mother. Tina asked to sleep with the foster parents. Tina watched the foster

mother work on the computer and cook dinner. Tina told the foster mother that she loved her.

Tammy could not betray her own mother by showing love to her foster parents even though she loved them. She was able to work toward some resolution of this dilemma through her artmaking. She had created a "self" who could be affectionate without betraying, a self who could express feelings that were too difficult for her to consciously acknowledge, a self who could say and do the things that she could not. Tammy was able to practice with Tina, try on a different role, and see what it felt like to be a full member of a family.

As Tammy became more comfortable with the possibility of adoption, she needed art again to help her resolve the dilemma of what to do with her feelings for her biological mother. One day she came into therapy and asked for a coffee can. She assembled other materials—a pair of scissors, glue, and white, pink, and blue paper. Tammy began cutting tiny pieces of white paper, about a 16th of an inch square, and dropping them into the can with much concentration and purpose. When asked what she was making, she announced, "Ashes!" as if that were the most natural thing in the world. "You know how when people die, they have something with ashes? That's what I want to make; I'm making my mom's ashes." She then instructed the therapist to continue the job of cutting tiny pieces of paper to fill the can while she took on the more important job of decorating the can with pink and blue hearts and stars.

Tammy's mother had not died, of course, but this was her way of conceptualizing the letting go process that was necessary for her to move on with her own life. Through this art piece, she symbolically mourned the loss of her mother. Several months later, Tammy was adopted, terminated therapy, and at last report, continued to be doing very well.

Discussion

How does this work? How is it that Tammy and Peter were able to approach their feelings in art but could not articulate them? Could this relate back to the brain and where and how trauma memories are stored? Could it be that Tammy and Peter had access to feelings in the emotional centers of the right brain and, therefore, could express feelings through art that were impossible to put into words? Tammy was able to do the work necessary to move on in her emotional life without ever having to confront the issues directly. Art therapists see this over and over again; clients can express feelings before they have words for these feelings. Ulman, a founder of art therapy, referred to art as "the meeting ground of the world inside and the world outside" (Ulman, 1975, p. 7). Perhaps it is also the means of integrating the world inside, the means of integrating an experience. Along with art, the other nonverbal expressive therapies—movement, music, poetry, drama—have the potential to lead people to emotions and feelings that have long been forgotten.

For true transformative work to happen in expressive work with a severely maltreated child, it appears that imagery has the most potential for therapy when it comes from the child and is not imposed by the therapist. Directives aimed at certain issues are not nearly as effective as the metaphors brought by the client. The therapist cannot choreograph the work or be very directive in this kind of approach. Rather, the therapist provides the resources and creative environment so that the child can find his or her own curative path.

Today a number of art therapy clinicians are turning to neuroscience for answers in their trauma work (Chapman, 2002; Gantt, Tinnin, & Tabone, 2002; Klorer & Chapman, 2004; Klorer & Malchiodi, 2003; Malchiodi, Kaplan, & Riley, 2002). Recent trends in American Art Therapy Association conference presentations suggest that practitioners of both eye movement desensitization reprocessing (EMDR) and art therapy are finding parallels in their processes (Chapman, 2003; Gruber, 2003; McNamee, 2003). Others are finding that the bridge between neuroscience and art therapy is becoming more pronounced (Henley, Kaplan, & Shore, 2003; Kaplan, 2000, 2004; Lusebrink, 2004; McNamee, 2004; Stewart, 2004). Two groundbreaking studies combined art therapy and neuroscience by using EEG recordings to understand what happens in the brain during and after artmaking (Belkofer & Konopka, 2003; Kruk, 2004). More such studies are needed. They represent a marriage that will further advance therapeutic work with severely maltreated children.

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