

## CHAPTER 1

# Neurobiology, Creative Interventions, and Childhood Trauma

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Children may be in therapy for a variety of reasons related to trauma. Some children experience the death of a parent, survive a serious accident, or lose their home or possessions due to a natural disaster. Others may experience several traumatic events during their young lives or be subjected to chronically stressful situations such as abuse, neglect, or multiple foster care environments. Although some children are not permanently affected by these experiences, others may suffer serious symptoms that interfere with normal emotional, cognitive, or social development.

Terr (1990) notes that “trauma does not ordinarily get better by itself. It burrows down further and further under the child’s defenses and coping strategies” (p. 293). Children who are traumatized often feel helpless, confused, and ashamed and are afraid to trust others or their environment. Therapists who encounter these children must form a productive relationship with them to enable them not only to revisit painful experiences, but also to overcome intrusive memories, make meaning, and find hope. In order to reach these children effectively, therapists must use both developmentally appropriate methods and interventions that address traumatic memories and provide emotional relief.

In recent years recognition has grown that trauma is an autonomic, physiological, and neurological response to overwhelming events or experiences that creates a secondary psychological response (Perry, 2009; Rothschild, 2000). This recognition has reframed how therapists intervene with individuals who have symptoms of stress, and it acknowledges that these symptoms are the body's adaptive reactions to distressing events. There is an increasing consensus that intervention must also employ techniques that focus on the sensory impact of trauma.

This chapter provides an overview of trauma from a neurobiological view and a foundation for understanding why sensory-based, creative interventions such as arts therapies and expressive methods are effective and often necessary in work with traumatized children. For therapists who are not familiar with these modalities, a brief description of creative arts therapies and expressive therapies is offered along with general information on the nature of traumatic events and their impact on children.

## DEFINING TRAUMA

For the purpose of this book, “trauma” is defined as an experience that creates a lasting, substantial, psychosocial, and somatic impact on a child. Traumatizing events can be single occurrences such as an accident or witnessing an injury to another or several experiences that become traumatic in their totality. Extensive exposure to neglect or abuse; experience of terrorism or war; or survival of a disaster and subsequent loss of home, possessions, and/or family members are examples of repeated or chronic trauma experiences. Terr’s (1981, 1990) seminal work with child survivors of the Chowchilla kidnapping incident offers some of the first reports on the complexity of traumatic experiences and posttraumatic symptoms. As a result of the Chowchilla study and subsequent investigations, Terr identified many of the characteristics commonly seen in traumatized children, including behaviors seen in art and play activities and influences on cognitive and emotional development. She also described two forms of traumatic events: acute or Type I trauma (single event) and chronic or Type II trauma (multiple or cumulative events). In either type of traumatic event, children may encounter physical and/or emotional disruption and suffer bodily trauma and/or psychological effects.

Therapists who work with traumatized individuals now understand that a number of factors actually mediate how single or multiple traumas affect children and how these factors may predispose young clients

to more serious problems. Posttraumatic stress disorder (PTSD) is well known to most mental health professionals; the current definition and criteria are found in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5; American Psychiatric Association, 2013). Characteristics similar to PTSD in children were described as early as the 1930s, reflecting the currently accepted symptom cluster in assessment of PTSD. It was not until 1987, in DSM-III-R (American Psychiatric Association, 1987), that specific features of children's PTSD emerged that account for developmental differences between young clients and adults. The current DSM-5 criteria for PTSD can be summarized in the following general reactions and responses:

- *Alterations in arousal.* Hyperarousal is common, including intense psychological distress and/or physiological reactivity when exposed to something that resembles an aspect of the traumatic event. This excessive arousal may cause difficulties with concentration, sleep problems such as difficulty falling or staying asleep, hypervigilance, and irritability or outbursts of anger. Children may also exhibit hypoarousal, including dissociation, when exposed to situations or experiences that stimulate sensory memories of a traumatizing event.
- *Reexperiencing.* Children may suddenly feel as though a traumatic event is recurring in the present, have intrusive thoughts about the event, and experience nightmares that include sensory or declarative aspects of the event. Reminders of the traumatic event come in the form of auditory, visual, olfactory, vestibular, and other sensory cues as well as anniversaries of events.
- *Avoidance.* Children may attempt to avoid thoughts or feelings associated with the traumatic event or to be unable to recall aspects of the event. They may attempt to avoid activities or situations that evoke memory of a trauma, detach from family and friends, have difficulty sleeping due to nightmares associated with the event, have decreased interest in previously pleasurable activities, and experience a foreshortened sense of the future.
- *Negative cognitions and mood.* Children may have a persistent and distorted sense of self-blame or may have a decreased interest in activities they previously enjoyed.
- *Developmental problems.* Children may experience developmental delays such as emotional and cognitive problems or attachment disorders if traumatic events disrupt relationships with parents or caregivers. This particular aspect of posttraumatic stress in children is believed

to be the result of multiple traumatic events, particularly interpersonal violence during childhood (a summary of developmental trauma is provided later in this chapter), and underscores the close association between repeated trauma exposure and disruptions in normal development in children.

DSM-5 includes a new subtype of PTSD, called *preschool subtype posttraumatic stress disorder*. In brief, more behaviorally and developmentally sensitive criteria are used to identify posttraumatic stress in younger children; for example, play can be used as a way to identify PTSD because very young children do not have the capacity to verbalize what they are feeling in response to traumatic experiences. Additionally, the criteria underscore that very young children may not display extreme or overt distress at the time of traumatic events, and their trauma reactions may become apparent in the form of impaired relationships with parents, caregivers, siblings, peers, or teachers.

In preschool children, school-age children, and adolescents, the duration of trauma reactions must exceed 1 month and cannot be attributed to another medical condition or other influence. A number of factors also affect how children respond to traumatic events and if they go on to exhibit emotional disorders, including PTSD. Biological aspects, temperament, resiliency, developmental stage, attachment to parents or caregivers, abilities and adaptive coping skills, and available social support are related to individual susceptibility to PTSD (U.S. Department of Health and Human Services, Administration for Children and Families, Administration on Children, Youth and Families, Children's Bureau, 2012), acute stress reactions, and mood or behavioral disorders. Children directly exposed to a traumatic event, such as a violent crime, death, or disaster, who do not have adequate social support in the form of family, caregivers, or community or who experience multiple crises are more susceptible to trauma and may require additional, long-term treatment. These children have a higher risk of PTSD and other stress-related disorders, although the prevalence rates vary depending on the research study (National Child Traumatic Stress Network, 2014; Silva, 2004). In brief, a number of characteristics and experiences contribute to how trauma affects children and whether or not children suffer long-lasting and disruptive symptoms.

Fortunately, only a portion of children exposed to stressful events go on to develop PTSD or other serious disorders, but it is widely accepted that vulnerability and resiliency factors (see Malchioli, Chapter 2, and

Part IV, this volume) impact the development of symptoms that require ongoing treatment. Most children need a minimum of intervention and usually return to normal personal and social functioning in a short time. In these cases, interventions that incorporate psychoeducation, debriefing, prevention strategies, and brief therapies may lessen the initial distress, identify social supports, and enhance adaptive coping skills.

### ***Developmental Trauma***

Bessel van der Kolk (2005) proposes the term *developmental trauma disorder* (DTD) to describe children who have experienced multiple traumatic events, such as chronic neglect or abuse. DTD is a concept intended to underscore the impact of chronic trauma on children's affect regulation, neurological functioning, and self-concept. Developmental trauma may disrupt children's capacities to play (Tuber, Boesch, Gorking, & Terry, 2014) and engage in creative expression, thus making it difficult to reach these young clients even through sensory-based interventions. Children who have experienced developmental trauma are often wary of relationships, even with a trusted therapist, because of early, repeated experiences of interpersonal violence and neglect. Chronic traumatic stress may overwhelm children's abilities to self-soothe, preventing retrieval of positive attachment experiences and sensations (Malchiodi & Crenshaw, 2014). Many have highly developed adaptive coping strategies that protect them from emotional closeness, readiness to learn, and imagination (Lieberman & Knorr, 2007). Although not formally a category in DSM-5, helping professionals often utilize the lens of developmental trauma when evaluating child clients who have experienced repeated incidences of abuse, neglect, violence or war, abandonment, and/or foster care.

## **THE NEUROBIOLOGY OF TRAUMA**

In response to a greater understanding of the neurobiology of trauma, there is now wide agreement that trauma reactions are both psychological (mind) and physiological (body) experiences. In order to help children who have been traumatized, it is first important to have a working knowledge of the neurobiology of trauma, know how the brain is organized, and understand how the body and mind react to traumatic events. This section does not intend to provide in-depth explanations

of human physiology and how trauma affects the brain; this material is widely available and is covered in numerous contemporary texts. Instead, the purpose here is to provide a basic overview that summarizes major concepts pertaining to trauma intervention as an introduction to creative interventions with traumatized children.

### ***The Triune Brain***

The human brain is often described as consisting of three basic parts: the brainstem, the limbic system, and the cortex. The brainstem is the first area to mature and is, from an evolutionary standpoint, the oldest area of the brain. It is responsible for regulating basic functions such as reflexes, the cardiovascular system, and arousal. The cerebellum is connected to the brainstem and coordinates motor, emotional, and cognitive functioning. The brainstem and cerebellum are often referred to as the “reptilian brain” because they are like the brain of reptiles (Levine & Klein, 2007).

The limbic system includes a group of structures—the hypothalamus, amygdala, and hippocampus—that forms a ring around the brainstem. The limbic system is often referred to as the “emotional brain” because it is the source of urges, needs, and feelings. Its primary functions involve self-preservation, the fight, freeze, or flight response, and implicit memory—learned associations that link sensations with context. The limbic system, in a sense, evaluates experiences for emotional significance and reacts to these experiences in ways that are learned by the individual over time.

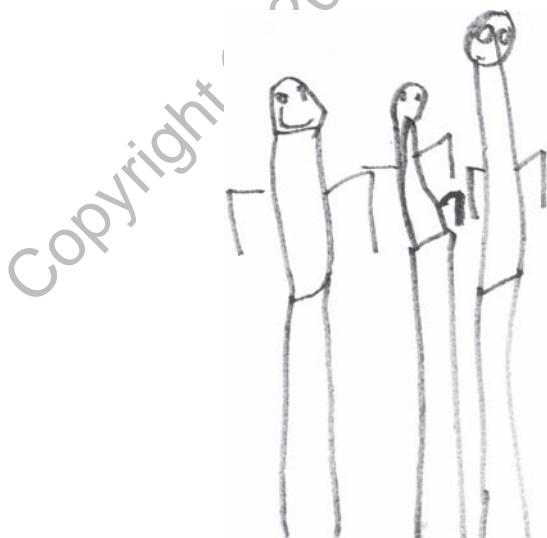
The cortex and neocortex are referred to as the “thinking brain” because they are the parts of the brain where reasoning, communication, and planning occur. They contain the capacity for language and consciousness and the ability not only to think thoughts, but also to think *about* thoughts, behaviors, and emotions. Despite the more complex levels of functioning mediated by this region of the brain, the lower parts of the brain also have a significant impact on actions and responses.

Trauma reactions are believed to occur when responses of the limbic system, activated to mobilize oneself in the face of personal threat, are not utilized in a productive way. Essentially, children who experience an event such as physical abuse, disaster, terrorism, or any other distressing occurrence may go into what can be considered a “survival mode.” In other words, if the energy normally used for fighting, freezing or fleeing is not expended, the emotional activation is held in the

nervous system and not dissipated or released (Levine, 2012). In the case of traumatic stress, even though the nervous system is still highly activated, children may experience a disruption or impairment in normal functioning and develop habitual responses such as explosive emotions, noncompliant behavior, psychological numbness, cognitive problems, or other reactions depending on personality factors and the type and extent of distress.

Consider 8-year-old Mark, a child who is currently in treatment at a local psychiatric facility. He has a long history of severe physical abuse, sexual abuse, and neglect and has lived in multiple foster homes. Mark has very little ability to control his impulses; in the classroom and play therapy room, he often initiates arguments with other children, steals, sets fires, and is prone to tearful outbursts when under even minimal stress. He finds it difficult to focus his attention on any one game or toy for more than a minute and reacts to fear-inducing situations with psychological numbing and withdrawal, frozen and unable to move. Mark is also developmentally delayed, behaving like a much younger child and drawing human figures at a 4-year-old level (Figure 1.1).

How the brain reacts to repetitive traumatic experiences may explain many of Mark's current responses to others and his environment. As an individual who is profoundly or chronically distressed,



**FIGURE 1.1.** Human figures by Mark, age 8 years.

Mark reacts with little self-control because he is unable to regulate his emotional responses. His behavior may be a survival response involving fighting (arguing) and sometimes freezing (psychological numbing and withdrawal), depending on the perceived threats in his environment that cause fear, terror, or feelings of helplessness. He may have learning disabilities due to years of distress that have affected his cognitive and social functioning. In contrast to Mark, healthy, capable, and resilient children can use problem-solving skills, available sources of social support, and other resources to overcome stressful events; those who have traumatic stress reactions cannot engage in healthy forms of functioning and go on to develop symptoms of PTSD or other emotional disorders.

### ***The Mind–Body Connection***

It is well accepted that the body often mirrors emotions. Different parts of the brain may become active when we look at sad faces or happy faces, imagine a happy or sad event or relationship, or hear a particular song or sound. These emotions are connected to a variety of hormonal fluctuations as well as cardiovascular and neurological effects (Sternberg, 2001). In fact, the physiology of emotions is so complex that the brain knows more than the conscious mind can reveal—that is, one can display an emotion without being conscious of what induced it (Damasio, 2000, 2011).

In the case of traumatic events, sensory experiences related to the crises (e.g., images, touch, sound, and smell) may become learned associations that resurface when one encounters a different, yet similar, set of stimuli. For example, when Mark feels insecure around other children, he automatically reacts with uncontrollable rage, recapitulating his early relationships with an abusive sister; if he feels threatened by an adult, he becomes hypervigilant and immobilized as his body prepares for physical violence or punishment. There is general agreement that traumatic events similar to the ones Mark has experienced take a toll on the body as well as the mind. After a significant trauma, the “body remembers” (Levine, 2012; Rothschild, 2000), and, as van der Kolk (1994) notes in the title of his classic book, “the body keeps score” of emotional experiences.

### ***Memory Storage***

The way in which memory is stored is also important to understanding how the brain is impacted by traumatic events. In brief, there are two

types of memory: explicit and implicit. Explicit or declarative memory is conscious memory and is composed of facts, concepts, and ideas; one has access to language to describe what one is thinking and feeling. Explicit memory allows conscious processing of information, reasoning, and meaning making, thereby helping individuals define and make sense of their experiences.

Implicit memory stores sensory and emotional components and is related to the body's learned memories. Riding a bicycle is a good example of implicit memory, whereas narrating the chronological details of the event (getting on the bike, pedaling to the park) is an example of explicit memory. In implicit memory, there is no language; the senses *are* the memory—what we see, what we hear, sensations of smell, touch, and taste become the implicit containers of that experience.

Many trauma specialists believe that posttraumatic stress reactions may result when implicit memory of trauma is excluded from explicit storage (Rothschild, 2000); that is, an individual may not have access to the context in which the emotions or sensations arose. Additionally, language (a function of explicit memory) is not generally accessible to trauma survivors after a distressing event. In particular, Broca's area, a section of the brain that controls language, is affected, making it difficult to relate the trauma narrative, leading to difficulties in identifying and verbalizing experiences (van Dalen, 2001). Van der Kolk observes that when an individual is about to speak about a traumatic event, “[therel] is a problem with verbalization . . . the Broca's area shuts down” (Korn, 2001, p. 4).

Perhaps this inability to verbalize one's responses to trauma relates to the human survival response; when an experience is extremely painful to recall, the brain protects the individual by literally making it impossible to talk about it. Because trauma is stored as somatic sensations and images, it may not be readily available for communication through language, but may be available through sensory means such as creative arts, play, and other experiential activities and approaches (Malchiodi, 2012a).

## **CREATIVE ARTS THERAPY AND PLAY THERAPY WITH TRAUMATIZED CHILDREN**

In addition to having a working knowledge of the physiology of trauma reactions in children, it is also important to understand the variety of therapeutic approaches that use creativity, imagination, and

self-expression as their core. Creative interventions have been formalized through the disciplines of art therapy, music therapy, dance/movement therapy, drama therapy or psychodrama, poetry therapy, and play therapy, including sandplay therapy. Each discipline has been applied in psychotherapy and counseling with individuals of all ages, particularly children, for more than 60 years. Art, music, dance, drama, and poetry therapies are referred to as *creative arts therapies* because of their roots in the arts and theories of creativity (National Coalition of Creative Arts Therapies Associations, 2014). These therapies and others that utilize self-expression in treatment are also called *expressive therapies* (Malchiodi, 2005, 2013, 2014). Expressive therapies are defined as the use of art, music, drama, dance/movement, poetry/creative writing, bibliotherapy, play, and/or sandplay within the context of psychotherapy, counseling, rehabilitation, or medicine. Additionally, expressive therapies are sometimes referred to as *integrative* when purposefully used in combination in treatment. These individual approaches are defined as follows:

- *Art therapy* is the purposeful use of visual arts materials and media in intervention, counseling, psychotherapy, and rehabilitation; it is used with individuals of all ages, families, and groups (Edwards, 2004; Malchiodi, 2012b).
- *Music therapy* is the prescribed use of music to effect positive changes in the psychological, physical, cognitive, or social functioning of individuals with health or educational problems (American Music Therapy Association, 2014; Wheeler, 2015).
- *Drama therapy* is the systematic and intentional use of drama/theater processes, products, and associations to achieve the therapeutic goals of symptom relief, emotional and physical integration, and personal growth. It is an active approach that helps the client tell his or her story to solve a problem, achieve catharsis, extend the depth and breadth of his or her inner experience, understand the meaning of images, and strengthen his or her ability to observe personal roles while increasing flexibility between roles (National Association for Drama Therapy, 2014).
- *Dance/movement therapy* is based on the assumption that body and mind are interrelated and is defined as the psychotherapeutic use of movement as a process that furthers the emotional, cognitive, and physical integration of the individual. Dance/movement therapy effects

changes in feelings, cognition, physical functioning, and behavior (American Dance Therapy Association, 2014).

- *Poetry therapy and bibliotherapy* are terms used synonymously to describe the intentional use of poetry and other forms of literature for healing and personal growth.
- *Play therapy* is the systematic use of a theoretical model to establish an interpersonal process wherein trained play therapists use the therapeutic powers of play to help clients prevent or resolve psychosocial difficulties and achieve optimal growth and development (Crenshaw & Stewart, 2014; Webb, 2007).
- *Sandplay therapy* is a creative form of psychotherapy that uses a sandbox and a large collection of miniatures to enable a client to explore the deeper layers of his or her psyche in a totally new format; by constructing a series of “sand pictures,” a client is helped to illustrate and integrate his or her psychological condition.
- *Integrative approaches* involve two or more expressive therapies to foster awareness, encourage emotional growth, and enhance relationships with others. This approach is distinguished by the practice of combining modalities within a therapy session. Integrative approaches are based on a variety of orientations, including the use of arts as therapy, as psychotherapy, and for traditional healing (Estrella, 2005; Knill, Levine, & Levine, 2005).

It is important to clarify that although some practitioners define art, dance/movement, music, or drama therapies as play therapies (Lambert et al., 2007), creative arts therapies and expressive therapies are not merely subsets of play therapy and have a long history as distinct approaches in mental health and health care. While the art activities may sometimes be a form of play, encouraging children to express themselves through a painting, music, or dance involves an understanding of the media beyond the scope of play. In brief, the arts therapies are different from play therapy because they integrate knowledge of art with principles of psychotherapy and counseling.

In addition to the disciplines and approaches mentioned above, many therapists integrate activities that enhance relaxation as part of trauma intervention. Relaxation techniques often include creative components such as music (see Hilliard, Chapter 4, this volume), movement, or art making. Guided imagery or visualization, meditation, yoga,

and other methods of stress reduction are also used with children who have experienced traumatic events (Murdock, 2013; Willard, 2010).

Art, music, and dance/movement therapies and other creative interventions such as play have sometimes been incorrectly labeled as *nonverbal* therapies. However, verbal communication of thoughts and feelings is a central part of therapy in most situations. In fact, most therapists who use these methods integrate them within a psychotherapy approach, including, but not limited to, psychodynamic, humanistic, cognitive, developmental, systems, narrative, solution-focused, and other approaches. For example, practitioners who describe their work with children in this book utilize specific frameworks to facilitate therapy with children based on current knowledge of best practices in trauma intervention. There are also creative interventions that specifically focus on verbal communication and self-expression as part of treatment, such as drama therapy, creative writing and poetry therapy, and bibliotherapy.

## **UNIQUE CHARACTERISTICS OF CREATIVE INTERVENTIONS WITH TRAUMATIZED INDIVIDUALS**

In a now classic article on trauma and creative interventions, Johnson (1987) observed that creative arts therapies have a unique role in the treatment of trauma-related disorders, noting that individuals who experience traumatic events have difficulty with verbal expression. He underscored the point that creative arts therapies are effective interventions with psychological trauma in children, individuals with mental illness or developmental delays, and older adults with neurodegenerative disorders or speech problems. Johnson's observations were made almost a decade before the fields of neurobiology, psychiatry, and psychology confirmed that trauma has profound effects on the part of the brain that controls language, and before the roles of explicit and implicit memory in trauma-related disorders were more fully identified.

For young trauma survivors with limited language or who may be unable to put ideas into speech, expression through art, music, movement, or play can be a way to convey these ideas without words and may be the primary form of communication in therapy. Creative interventions involving art, play, music, movement, or other modalities add a unique dimension to treatment because they have several specific characteristics not always found in strictly verbal therapies used in trauma

intervention. They are also “brainwise” (Badenoch, 2008) interventions because they are compatible with what we know about how traumatic experiences affect the brain. The brainwise characteristics of these approaches include, but are not limited to, their ability to facilitate (1) externalization, (2) sensory processing, (3) right-hemisphere dominance, (4) arousal reduction and affect regulation, and (5) relational aspects.

### ***Externalization***

In trauma intervention, externalization of trauma memories and experiences is considered central to the process of relief and recovery. All therapies, by their very nature and purpose, encourage individuals to engage in a process of externalizing troubling thoughts, feelings, and experiences. Creative interventions encourage externalization through one or more modalities as a central part of therapy and trauma intervention. Gladding (2012) notes that using the arts in counseling may speed up the process of externalization and that expressive modalities allow people to experience themselves differently. Early studies by Terr (1990) identify specific ways that children externalize their trauma experiences through play in repetitive, abreactive, and corrective actions.

Externalization through visual means, play activity, movement, or other modalities may help shift traumatic experiences from the present to the past (Collie, Backos, Malchiodi, & Spiegel, 2006). In art therapy, for example, trauma memories can be externalized through the creative process of making or constructing an image or object. Self-expression through a painting, movement, or poem can relate past experiences, but this is only one benefit of how creative expression externalizes trauma. In fact, most therapists using creative arts or expressive therapies in trauma intervention capitalize on the ability of art, music, play, and other comparable methods of expression to *contain* traumatic experiences rather than encourage cathartic communication of raw emotions or mere repetition of troubling memories. Essentially, child clients are encouraged to use creative self-expression as a repository for feelings and perceptions that can be transformed during the course of treatment, resulting in emotional reparation, resolution of conflict, and a sense of well-being. When verbal communication is limited after traumatic experiences, it may be that some other form of externalization must be used in addition to verbal therapies such as cognitive-behavioral or other accepted approaches to trauma relief.

### ***Sensory Processing***

In many approaches to trauma intervention, therapists encourage individuals to explore the trauma narrative—the story of what happened when the trauma occurred and the feelings associated with the event—at some point during treatment. The goal is to help traumatized individuals process what is distressing; transform disturbing behaviors, thoughts, and feelings; and ultimately find relief. With children, however, expressing the trauma story with words is not always possible for developmental reasons, and, as previously mentioned, for severely traumatized clients, words may not be accessible when it comes to describing trauma memories. In many cases, it may be counterproductive to ask young trauma survivors, particularly those who have experienced interpersonal violence, to describe or directly revisit traumatic events.

Expressive and creative arts therapies are defined by psychology as “action” or “experiential” therapies (Weiner, 1999) because they are action-oriented methods through which individuals explore issues and communicate thoughts and feelings. Art and music making, dance and drama, creative writing, and all forms of play are participatory and sensory and require individuals to invest energy in them. For example, art making, even in its simplest sense, can involve arranging, touching, gluing, stapling, painting, forming, and many other tangible experiences. All creative methods focus on encouraging clients to become active, empowered participants in the therapeutic process.

Creative interventions not only serve as a catalyst for individuals to explore thoughts, feelings, memories, and perceptions, they also involve visual, tactile, olfactory, auditory, vestibular, and proprioceptive experiences. Creative activity can also be used with verbal therapies in trauma intervention with children to enhance communication. Drawing, for example, facilitates children’s verbal reports of emotionally laden events in several ways: by reducing anxiety, helping the child feel comfortable with the therapist, increasing memory retrieval, organizing narratives, and prompting the child to tell more details than in a solely verbal interview (Gross & Haynes, 1998; Lev-Weisel & Liraz, 2007).

Because highly charged emotional experiences such as trauma are encoded by the limbic system as a form of sensory reality, expression and processing of sensory memories of the traumatic event are necessary to achieve successful intervention and resolution (Rothschild, 2000). Action-oriented activities tap the limbic system’s sensory memory of the event and may help bridge implicit and explicit memories of it

(Malchiodi, 2012a; Steele & Malchiodi, 2012) because the brain creates images to contain all the elements of traumatic experience—what happened, emotional reactions to it, and the horror and terror of the experience. When memory cannot be expressed linguistically, it may remain at a symbolic level where there are no words to describe it. In brief, to retrieve that memory so that it can become conscious, it must be externalized in its symbolic form.

Many trauma specialists believe that sensory expression may make progressive exposure of the trauma story and expression of traumatic material tolerable, helping patients overcome avoidance and allowing the therapeutic process to advance relatively quickly (Collie et al., 2006). Active participation and progressive sensory exposure through creative methods may also help reduce the emotional numbing that occurs with PTSD by allowing children to actively imagine, to experiment with or reframe an event, or to rehearse a desired change through self-expression. That is, creative methods involve tangible objects, play activities, movements, or other experiences that can be physically altered. The role of imagination in expressive therapies is illustrated throughout this book, but in essence these therapies assist children in moving beyond preconceived beliefs through experimentation with new ways of communication and sensory activities that involve “pretend.”

### ***Right-Hemisphere Dominance***

In the field of attachment, it is widely accepted that what happens early in life in terms of relationships affects brain development and is essential to secure attachment (Perry, 2009). *Neuroplasticity* is the brain's ability to renew and, in some cases, even rewire itself to compensate for deficits. Brain plasticity is greater earlier in life, a fact that underscores the importance of intervening with young children to enhance not only their attachment, but also their affect regulation, interpersonal skills, and cognition.

The right hemisphere of the brain is particularly active during early interactions between very young children and caregivers, and when early interactions have been positive, it stores the internal working model (Bowlby, 1988/2005) for secure attachment relationships and healthy affect regulation (Schore, 2003). Siegel (2012) and Schore (2003) note that interactions between baby and caretaker are right-brain mediated because during infancy the right cortex is developing more quickly than

the left. Siegel proposes that the output of the right brain is expressed in “non-word-based ways” such as drawing a picture or using a visual image to describe feelings or events. Although creative arts therapies are whole-brain activities, there is substantial evidence that they have right-hemisphere dominance in terms of engaging spatial, sensory, and other nonverbal aspects of experience and communication (Malchiodi, 2014). In brief, current thinking about trauma in general supports the effect of childhood trauma on right–left brain integration (Teicher, 2000) and that sensory-based interventions, such as art and play, may be more effective than language-based interventions because they are right-brain dominant (Kloster, 2008).

### ***Arousal Reduction and Affect Regulation***

The reduction of arousal or hyperarousal in young clients is a central goal in trauma intervention. Children who have been victims of interpersonal violence are particularly at risk for problems with hyperarousal, hypoarousal (dissociative states), and affect regulation. On an implicit level, these children’s worldviews often include feelings of abandonment and lack of safety; in order to stay safe, they often react with rage at anyone who is perceived as a threat, or they disengage (dissociate) from adults because they have learned that caregivers abandon or hurt children.

For this reason, most forms of trauma intervention begin with a focus on regulation of emotions, stress reduction, and restoration of feelings of safety. Art therapy and music therapy, for example, can be used to activate the body’s relaxation response to soothe and reduce stress reactions. In my earliest work with children from violent homes, I learned that art and other expressive activities had a soothing, hypnotic influence and that traumatized children were naturally attracted to these experiences when anxious or suffering posttraumatic reactions (Malchiodi, 1990). Creative arts therapies in general seek to help individuals find activities that are effective in tapping their positive sensory experiences, which can then be practiced over time and eventually become resources for self-regulation of overwhelming emotions. In trauma intervention, recalling memories of positive events that can reframe and eventually override negative ones is helpful in reducing posttraumatic stress, particularly if a sensory experience of “remembered wellness” or safety is included. Simple activities such as drawing a

picture of a pleasant time or hearing a soothing, familiar song, story, or rhyme appear to be effective because of the capacity of image making to elicit sensory memories and details of positive moments (Malchiodi, Riley, & Hass-Cohen, 2001). Both music therapy (Wheeler, 2015) and art therapy (Malchiodi, 2013) have demonstrated reductions in autonomic responses such as blood pressure, heart rate, and respiration.

### ***Relational Aspects***

*Interpersonal neurobiology* (Siegel, 2012; see also Badenoch, 2008) refers to an overarching theory that brings together many concepts that have emerged from attachment research, neurobiology, and developmental and social psychology. It is based on the idea that social relationships shape how our brains develop, how our minds perceive the world, and how we adapt to stress throughout the lifespan. In brief, all psychotherapy and counseling are relational approaches because the outcome of intervention is dependent on the core relationship between the therapist and client.

Creative arts therapies are inherently relational therapies because they involve an active, sensory-based dynamic between practitioner and individual; all creative arts therapies that involve mirroring, role play, enactment, sharing, showing, and witnessing are relational approaches to treatment (Malchiodi, 2005, 2012b, 2014). They may be helpful in tapping early those relational states that existed before words became dominant, allowing the brain to establish new, more productive patterns (Malchiodi, 2012a; Riley, 2002). Additionally, being an attuned and focused witness to a child's efforts to complete a hands-on task and assisting those efforts, when appropriate, mimics the neurobiological relationship between a caring adult and child. For some children, repetitive experiential and self-rewarding experiences that include a positive and attuned witness are central to repairing developmental trauma (Perry, 2009).

Although all the creative arts therapies can be used with a goal of enhancing relationships, dance/movement therapy is most often used to address relational issues because it focuses on the body. For example, mirroring is commonly used to establish and enhance the relationship between the individual and the therapist. The goal of mirroring is not imitation of movements, postures, facial expressions, and gestures, but to achieve a sense of connection and understanding between the client

and practitioner. Mirroring is also a form of nonverbal, right-hemisphere communication that naturally occurs in secure attachment relationships through the gestures, postures, and facial expressions that transpire between a caregiver and child (for more information, see Gray, Chapter 8, this volume).

Relational aspects are evident in art, music, and drama therapies also. In art therapy, a therapist is a provider of materials (nurturer), assistant in the creative process, and active participant in facilitating visual self-expression. Music therapy provides similar experiences through interaction with music making; it also has the potential to tap social engagement and communication when collaboration or simultaneous instrument playing is involved. Finally, drama therapy offers multisensory ways to establish relationship through role play, mirroring, and enactment and often includes other creative arts and play to reduce stress and assist trauma integration.

## CONCLUSION

Applying creative interventions in trauma intervention has enormous potential, as demonstrated in this chapter and throughout the applications and cases described in this book. For children in general, creative activities in therapy offer many benefits: pleasure in making, doing, and inventing; play and imagination; and enhancement of self-worth through self-expression. There are additional reasons to consider integrating creative arts therapies, play therapy, and other action-oriented approaches for children who are traumatized. For these young trauma survivors, creative expression (1) offers a way to contain traumatic material within an object, image, story, music, or other art form; (2) provides a sense of control over terrifying and intrusive memories; (3) encourages active participation in therapy; (4) reduces emotional numbness; and (5) enhances reduction of hyperarousal and other distressing reactions. When verbal techniques fail to ameliorate trauma memory in children, art, play, music, or movement can provide the necessary means to reenact the feelings and sensations associated with traumatic experiences. In subsequent chapters, these and other advantages of creative activities, as used in intervention with traumatized children, are described to demonstrate in detail how these approaches facilitate emotional reparation, relief, and recovery.

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