

CHAPTER 2

Art Therapy and the Brain

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Art therapy has historically resisted an association with science and has favored a more art-based stance in its philosophy and practice. However, recent scientific findings about how images influence emotion, thoughts, and well-being and how the brain and body react to the experience of drawing, painting, or other art activities are clarifying why art therapy may be effective with a variety of populations. As science learns more about the connection between emotions and health, stress and disease, and the brain and immune system, art therapy is discovering new frontiers for the use of imagery and art expression in treatment.

Over the last several decades, a growing body of knowledge from science and medicine has redefined mental health interventions. In 1993, Bill Moyers brought to public consciousness “mind–body medicine” in a public television series, *Healing and the Mind*. “Mind–body medicine” is a popular term used to describe an approach that views the mind as having a central impact on the body’s health. Although it has received attention over the last several decades, it is not a new idea because many mind–body techniques such as meditation and yoga have been around for thousands of years. Researchers such as Benson (1975, 1996), who has investigated the “relaxation response,” and Ader (2001), who is a leader in the field of psychoneuroimmunology (the integrated study of the mind, neuroendocrine system, and the immune system), and others have expanded the incorporation of mind–body methods into mainstream medicine.

Neuroscience, the study of the brain and its functions, is rapidly influencing both the scope and practice of psychotherapy and mind–body approaches. As new tech-

nologies allow researchers to scan brain and other neurological and physiological activity in the body, we are learning more about the relationship between mind and body. Damasio (1994), Sapolsky (1998), and Ramachandran (1999), among others, have described the neurological and physiological phenomena related to memory and how images conceptualized and how they affect the brain and body. Siegel (1999); van der Kolk, McFarlane, and Weisaeth (1996); and Schore (1994) have broadened the understanding of how the brain, human physiology, and emotions are intricately intertwined, the importance of early attachment on neurological functions throughout life, and the impact of trauma on memory. These findings are far-reaching, affecting how psychotherapy is being designed and delivered.

The relationship between neuroscience and art therapy is an important one that influences every area of practice (Malchiodi, Riley, & Hass-Cohen, 2001). Kaplan (2000) underscores the overall importance of scientific-mindedness in the practice of art therapy, the significance of neuroscience to the field, and the relevance of mind-body unity to mental imagery and artistic activity. Ultimately, science will be central to understanding and defining how art therapy actually works and why it is a powerful therapeutic modality.

ART THERAPY AS A MIND-BODY INTERVENTION

The National Center for Complementary and Alternative Medicine (NCCAM, 2002), a division of the National Institutes of Health (NIH), has defined mind-body interventions as those which are designed to facilitate the mind's capacity to influence bodily function and symptoms. Many approaches that have a well-documented theoretical basis, such as patient education and cognitive-behavioral approaches, are now characterized as "mainstream" by NCCAM. Art therapy is considered a mind-body intervention, although it has been used mostly as a form of psychotherapy rather than an intervention that modifies physiology, symptoms, and other aspects of health (National Institutes of Health, 1994). Only recently research in art therapy is beginning to indicate why it can be used as a mind-body method (Malchiodi, 1993, 1999). For example, DeLue (1999) demonstrated the physiological effects of drawing mandalas with a group of school-age children, using biofeedback to measure skin temperature along with blood pressure and pulse monitors. Camic (1999) conducted a study using visual art and other art forms along with cognitive-behavioral techniques, meditation, and mental imagery to reduce chronic pain in adults. Others have investigated how art making complements medical treatment and supports patients' abilities to cope with symptoms and stress (Anand & Anand, 1999; Gabriels, 1999; Hildebrand, 1999; Lusebrink, 1990).

In general, studies of mind-body interventions (including art therapy), while promising, have had some major shortcomings. For example, much of the research in this area has yet to be replicated by independent investigators. Also, there are no clearly explained reasons why some initially promising interventions have yielded conflicting results in subsequent studies. Fortunately, with the advent of increasingly sophisticated technology that has broadened an understanding of the brain and its

relationship to the body, more evidence is emerging that will demonstrate why, how, and with whom mind–body interventions are effective.

NEUROSCIENCE AND ART THERAPY

How the brain functions and how it influences emotions, cognition, and behavior are important in the treatment of most problems people bring to therapy, including mood disorders, posttraumatic stress, addictions, and physical illness. Although many areas of research are relevant to the practice of psychotherapy, several areas are particularly important to art therapy. These areas include images and image formation, physiology of emotion, attachment theory, and the placebo effect.

Images and Image Formation

Common sense tells us that images do have an impact on how we feel and react. For example, just imagining biting into a lemon may cause one's mouth to pucker and seeing a favorite food may cause one to salivate. Images can create sensations of pleasure, fear, anxiety, or calm and there is evidence that they can alter mood and even induce a sense of well-being (Benson, 1975). There is solid evidence that images have a significant impact on our bodies. Simple experiments have provided evidence that even exposure to the images of nature from a hospital room window can decrease the length of stay and increase feelings of well-being in patients (Ulrich, 1984).

Art therapist Vija Lusebrink (1990) observes that images are “a bridge between body and mind, or between the conscious levels of information processing and the physiological changes in the body” (p. 218). Guided imagery, an experiential process in which an individual is directed through relaxation followed by suggestions to imagine specific images, has been used to reduce symptoms, change mood, and harness the body's healing capacities. Art therapists and others have applied principles of mental imagery and guided imagery to work with individuals in a variety of settings. For example, Baron (1989) employed guided imagery as a part of art therapy in the treatment of individuals with cancer.

Until relatively recently, researchers have only been able to speculate about how guided imagery works. Neuroscience is rapidly increasing the understanding of mental imagery, image formation, and the regions of the brain involved in image creation. For example, research shows that imagery we see or we imagine activates the visual cortex of the brain in similar ways. In other words, according to Damasio (1994), our bodies respond to mental images as if they are reality. He also notes that images are not just visual and include all sensory modalities—auditory, olfactory, gustatory, and somatosensory (touch, muscular, temperature, pain, visceral, and vestibular senses). Images are not stored in any one part of the brain; rather, many regions of the brain are part of image formation, storage, and retrieval.

The increasing understanding of the brain's hemispheres and their interactions has also contributed to the understanding of mental images and art making. In the past, it was believed that the right and left brain generally had two different func-

tions; the right brain was the center of intuition, creativity, while the left brain was thought to be engaged in logical thought and language. Some claimed art therapy's value was due to its ability to tap right brain functions, observing that art making is a "right-brained" activity (Virshup, 1978). In reality, the brain's left hemisphere (where language is located) is also involved in making art. Gardner (1984), Ramachandran (1999), and others have demonstrated that both hemispheres of the brain are necessary for art expression and evidence can be seen in the drawings of people with damage to specific areas of the brain. Researchers have also discovered connections between language and certain movements in drawing. For example, in a study using positron emission tomography (PET) scan, brain activity of individuals drawing forms in space was recorded. The results indicate that even simple drawing involves complex interactions between many parts of the brain (Frith & Law, 1995).

Images and image formation, whether mental images or those drawn on paper, are important in all art therapy practice because through art making clients are invited to reframe how they feel, respond to an event or experience, and work on emotional and behavioral change. In contrast to mental images, however, art making allows an individual to actively try out, experiment with, or rehearse a desired change through a drawing, painting, or collage; that is, it involves a tangible object that can be physically altered.

Attachment Theory

Attachment theory (Bowlby, 1969) has been used as a theoretical base for psychotherapy for many years but has more recently become a major focus of neuroscience and renewed interest among therapists. Siegel (1999) explains attachment as follows: "Attachment is an inborn system in the brain that evolves in ways that influence and organize motivational, emotional, and memory processes with respect to significant caregiving figures" (p. 67). Schore (1994) offers a neurological model for the importance of infant attachment throughout life. He notes that soon after birth the caretaker and infant develop interactions that are important to the process of affect regulation. Face-to-face contact and soothing touch are examples of ways the infant learns to respond to stimulation from people and experiences. Perry, Pollard, Blakley, Baker, and Vigilante (1995) proposes that successful attachment is critical to optimal development of specific parts of the brain. He believes that a healthy attachment between infant and caretaker sets the stage for the individual to develop the capacity to "self-regulate" stimulating experiences. Early childhood bonding is imprinted on the brain, laying a foundation for relationship patterns later in life; when trauma is present, brain imprinting is changed, but may be corrected with appropriate intervention.

Research in neuroscience is demonstrating that infancy is not the only chance a person has for healthy attachment and there seem to be ways to reshape and repair some early experiences. Art therapy is one way being explored to reestablish healthy attachments, both through therapist and client, and through encouraging healthy interactions between parent and child. Riley (2001) cites how art activities are being used in early childhood attachment programs and how simple drawing exercises can

be used to resolve relational problems and strengthen parent–child bonds. She explains that the nonverbal dimensions of art activities tap early relational states before words are dominant, possibly allowing the brain to establish new, more productive patterns.

Siegel (1999) and Schore (1994) believe that interactions between baby and caretaker are right-brain mediated because during infancy the right cortex is developing more quickly than the left. Siegel also observes that just as the left hemisphere requires exposure to language to grow, the right hemisphere requires emotional stimulation to develop properly. He goes on to say that the output of the right brain is expressed in “non-word-based ways” such as drawing a picture or using a picture to describe feelings or events. According to this idea, art therapy may be an important modality in working with attachment issues, among other emotionally related disorders or experiences.

The Physiology of Emotion

It is well-known that the body is often a mirror of an individual’s emotions. When we are anxious, our palms sweat or our faces may be ashen, or we may turn red when embarrassed. Images affect our emotions and different parts of the brain may become active when we look at sad faces or happy faces or mentally image a happy or sad event or relationship (Sternberg, 2001). There are also a variety of hormonal fluctuations as well as cardiovascular and neurological effects. In fact, the physiology of emotions is so complex that the brain knows more than the conscious mind can itself reveal (Damasio, 1994). That is, one can actually display an emotion without being conscious of what induced the emotion.

Trauma has received increasing attention in neuroscience because it is now believed to be both a psychological and physiological experience. There is general agreement that traumatic events take a toll on the body as well as the mind and, thus, posttraumatic stress disorder (PTSD) is defined through both psychological and physiological symptoms. Many have pointed to the true core of trauma as being physiological (Rothchild, 2000; Levine, 1997), and, as van der Kolk metaphorically notes, “the body keeps the score” of the emotional experience.

Although many parts of the brain are important in trauma, the limbic system, the seat of survival instincts and reflexes, has been given considerable attention. It includes the hypothalamus, the hippocampus, and the amygdala, which is also pertinent to understanding traumatic memory. Though the function of the limbic system will not be covered in detail here, recent findings indicate its role in the sensory memories of stressful events and trauma. These findings are revealing why art expression is a useful part of therapy, trauma debriefing, and psychological recovery. Because the core of traumatic experiences is physiological, the expression and processing of sensory memories of the traumatic event are essential to successful intervention and resolution (Rothchild, 2000; Schore, 1994). Art is a natural sensory mode of expression because it involves touch, smell, and other senses within the experience. Drawing and other art activities mobilizes the expression of sensory memories (Steele, 1997; Steele & Raider, 2001) in a way that verbal interviews and interventions cannot. Highly charged emotional experiences, such as trauma, are encoded by the

limbic system as a form of sensory reality (Malchiodi et al., 2001). For a person's experience of trauma to be successfully ameliorated, it must be processed through sensory means. The capacity of art making to tap sensory material (i.e., the limbic system's sensory memory of the event) makes it a potent tool in trauma intervention. Specific drawing tasks, such as "draw what happened" (Pynoos & Eth, 1985; Malchiodi, 2001; Steele, 1997) and other related directives are proving to be effective in tapping sensory memories as well as generating narratives that can be altered through cognitive reframing techniques (Steele & Raider, 2001) to reduce long-term sequelae of posttraumatic stress.

The way in which memory is stored is also shedding light on why art therapy may be helpful to those who are traumatized. There are two types of memory: explicit memory is conscious and is composed of facts, concepts, and ideas and implicit memory is sensory and emotional and is related to the body's memories. Riding a bicycle is good example of implicit memory; narrating the chronological details of an event is an example of explicit memory. Currently, there is some speculation that PTSD, in part, may be caused when memory of trauma is excluded from explicit storage (Rothchild, 2000). Problems also result from traumatic memories when implicit memories are not linked to explicit memories; that is, an individual may not have access to the context in which the emotions or sensations arose. Art expression may help to bridge the implicit and explicit memories of a stressful event by facilitating the creation of a narrative through which the person can explore the memories and why they are so upsetting. Art activities, in this sense, may help the traumatized individual to think and feel concurrently, while making meaning for troubling experiences.

Finally, art therapy can be used to tap the body's relaxation response. Drawing, for example, is hypothesized to facilitate children's verbal reports of emotionally laden events in several ways: reduction of 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). Malchiodi (1997, 2001) observed in working with children from violent homes that art activity had a soothing, hypnotic influence and that traumatized children were naturally attracted to this quality when anxious or suffering from posttraumatic stress. Someday, through the use of brain scans and other technology, we may have a clearer understanding of exactly how to use art therapy to tap the relaxation response for clients of all ages who have undergone intense stress.

Placebo Effect

The power of belief, often referred to as the placebo effect, is an effective mind-body intervention that can enhance healing and well-being (Sternberg, 2001). Art therapy, like other forms of therapy or treatment, can enhance the placebo effect because it involves the individual's confidence in the therapist and therapy, a special place of healing (in this case, the art therapy room), and an activity that the person performs (drawing, painting, or other art making). These are well-known elements recognized to contribute to the placebo effect in both psychotherapy and medicine.

Benson (1996), acclaimed for his work with the relaxation response, observes

that it is possible for everyone to remember the calm and confidence associated with health and happiness. Even when physically ill, individuals can access what Benson calls “remembered wellness,” increasing the sense of well-being despite distress or illness. 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 is included. Simple art activities such as drawing a pleasant time appear to be effective because of the sensory capacity of image making to more deeply recall actual memories and details of positive moments (Malchiodi et al., 2001).

While faith in treatment is thought to be a central feature of the placebo effect, it may be other aspects heretofore unacknowledged that contribute to healing. Tinnin (1994) proposes that art therapy facilitates healing in a similar way to the placebo effect because it uses mimicry, an instinctive, preverbal function of the brain that is basic to self-soothing. An example of mimicry might be a child stroking a blanket in a way that mimics a mother’s soothing to activate an internal process of self-relaxation. Art making may stimulate a similar experience and provide experiences that self-soothe and repair, as noted in the previous section. According to Tinnin, this type of experience intentionally stimulates self-healing through placebo effect. He adds that “art therapy has a unique and specific potential relative to self-healing because of the way art affects the brain” (p. 77).

CONCLUSION

Neuroscience continues to provide an ever-widening understanding of how the brain and body react to stress, trauma, illness, and other events. It also is central to understanding how images influence emotions, thoughts, and well-being and how the visual, sensory, and expressive language of art are best integrated into treatment. Using neuroscience as a point of reference explains many of the approaches to art therapy discussed in this volume. For example, the application of object relations theory is enhanced with what is currently known about attachment and cognitive-behavioral approaches are supported by an understanding of images, image formation, and the physiology of emotions.

The impact of neuroscience on all aspects of health care will literally repaint the picture (Kaplan, 2000) of how art therapy is used in the treatment of emotional and physical disorders in the future. As additional research on neuropsychology and mind–body paradigms emerge, we will undoubtedly learn more about how artistic expression helps individuals with emotional distress or physical illness and why images and image making are central to enhancing health and well-being.

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