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The mirror neuron system and embodied simulation: Clinical implications for art therapists working with trauma survivors

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ABSTRACT

Using nodal sessions in the case of a profoundly traumatized woman as an illustrative foundation, this paper explores the mutative actions of psychoanalytically informed art therapy interventions. The efficacy of these interventions, which range from subtle to active, is supported by current research in the fields of neurobiology, infant development, cognitive science, and psychoanalysis. Focus is given to the continuum of dissociation as a survival response to overwhelming trauma, the relationship of dissociative processes to implicit memory, the mirror neuron system, and embodied simulation, as well as ways that the therapist's sensitivity to the impact of trauma and dissociation on the survivor can be harnessed to promote the healing process.

> It is only through its indirect and dialogic nature that the art of trauma can come close to representing the emptiness at the core of trauma while still offering the survivor the possibility of repossession and restoration. (Laub & Podell, 1995, p. 993)

"Meeka," a 27-year-old immigrant from West Africa, developed full-blown, debilitating post-traumatic stress disorder (PTSD) after being violently arrested in her home by undercover police officers and imprisoned for almost 3 days for a crime she did not commit. Ten months later, in her second individual art therapy session, she created her first drawing (see Fig. 1).

When I asked her if there was a story that went with the picture, she stated flatly, "This is a woman dressed up and going to work. She's upset, probably about something going on at home." As I watched her draw the pattern on the woman's skirt, comprised of sharp, sword-like shapes that encircled her genital area, I experienced a visceral sense that Meeka had been sexually abused in some way during her ordeal. A closer examination of the drawing after the session seemed to support my initial response. During our subsequent 3-year course of psychoanalytic psychotherapy and art therapy, the first phase of which I will describe in more detail below, the art making process enabled Meeka to become conscious of and verbally process dissociated memories involving the threat of sexual abuse. She was also able to work through feelings related to the experience of having her home and her life traumatically intruded upon. However, she never spontaneously disclosed having sustained any type of explicit sexual abuse. Though I chose not to press her on the subject, I continued to believe that she might have been physically violated at some point in her life.

Seven years later, on the eve of Meeka's multi-million dollar lawsuit against the municipality in which we lived, during which I was to testify on her behalf, I read a newspaper article describing her case. The journalist, having been given access to the police records by Meeka's attorneys, wrote that Meeka, seven months pregnant at the time of her arrest, had been suspected of concealing illegal drugs on or in her body. Before being taken to prison, she had been ordered to strip by a female police officer, who subjected her to a body-cavity search. I realized then that this profoundly invasive and traumatizing experience, though completely dissociated from Meeka's conscious, declarative memory, had indeed been stored in an implicit, multi-sensory form that she unconsciously but automatically translated into the symbolic realm of her first drawing. I, in turn, had implicitly perceived and then consciously processed and held this unspeakable memory for Meeka.

This sequence of events is a vivid and confirmatory illustration of a regular occurrence in the sessions of art therapists who work with trauma survivors: the readily expressed symbolic/metaphoric representation of our patients' dissociated or implicitly remembered experiences in the concrete form of visual art, and our own empathic capacity for decoding the possible meanings embedded in these images. As Acosta (2001) suggested, a purely mechanistic, intellectualized approach to pictorial analysis is to be avoided: "An intuitive response to images, which often may be regarded as unreliable and too subjective by many, is in fact a necessary...process that occurs before one may begin to

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Fig. 1. The first drawing: "This is a woman dressed up and going to work."

comprehend the symbolic meaning of images" (p. 94). She continued:

> The key to understanding pictorial images, therefore, is not controlling one's subjective responses to images, but rather allowing one's self to fully and freely experience the visual world that is represented by such expressive elements as color, line, and spatial composition. What is required from the viewer is keen aesthetic sensitivity and a strong affinity and empathy for visual images in order to perceive and experience the aesthetic dynamics inherent in each image. Because the expressive elements mentioned above possess their own psychological properties, many images contain aesthetic characteristics that predetermine the symbolic implications. This gestalt, inherent in each image, inevitably controls the otherwise endless diversity of subjective responses in the viewer. (p. 94)

In this description, there is a dynamic interaction between the mind of the skilled viewer and the expressive elements that make up the image. The expressive elements *themselves* arise out of a dynamic interplay between the mind and body of the artist and the art materials that is "inseparable from the creator's inner psyche" (p. 97), and includes the context of the therapeutic relationship and setting.

Freud (1913/1958) believed that "everyone possesses in his own unconscious an instrument with which he can interpret the utterances of the unconscious in other people" (p. 320). He confidently (and accurately) predicted that technological advances would eventually endow the study of neurobiological functioning with the level of sophistication required to locate the physiological underpinnings of many of his core theories of the mind (Freud, 1916–17/1963, p. 389). In this paper, I will present recent findings from the field of neuroscience regarding the discovery and functioning of the mirror neuron system, and the related process of 'embodied simulation.' These findings can be seen as identifying some of the neuroanatomical mechanisms that contribute to: (1) the trauma survivor's capacity to express dissociated feelings and memories symbolically in a work of art, and often to go on to put into words what had previously been unspeakable; (2) the art therapist's ability to intuitively interpret the many possible meanings of the art work made in the psychotherapeutic setting; and (3) the efficacy of particular art therapy interventions with survivors of trauma.

In the following section I describe some of the types of interventions made by art therapists in the treatment of traumatized populations. I offer the description as a kind of lens through which the reader can examine the research data and clinical material I subsequently present.

A brief overview of art therapy and the treatment of PTSD

The efficacy of art therapy in treating traumatized populations, from both a psychological and neurological perspective, is well documented in the literature. Seminal papers by creative arts therapists such as Edwards (1993), Golub (1985), Howard (1990), and Johnson (1987), along with more recent papers, such as those by Collie, Backos, Malchiodi, and Spiegel (2006), Crenshaw (2006), Klorer (2005), Spring (2004), Talwar (2007), and Tripp (2007), attest to art therapy's success in enabling trauma survivors to symbolically express, process, and contain feelings they find difficult or impossible to put into words.

As van der Kolk (1988) and many others have noted, "unspeakable terror" (p. 282) is physiologically based, and presents as "horrific images, visceral sensations, or as fight/flight/freeze reactions" (p. 282). A complex cascade of neurochemical changes occurs in the brain during and after severe or prolonged stress (see Yehuda, 2006). Of particular relevance to this paper is the suppression of the functioning of the hippocampus, the area of the brain that registers autobiographical, or 'episodic,' memory on an explicit level, and the activation of the amygdala, which recognizes and automatically responds to danger, and forms conditioned fear reactions. This leads to context-free, fearful memories and associations of the trauma that are encoded in implicit, sensorimotor form, are difficult to locate in place and time, and are therefore often impossible to verbally articulate (van der Kolk, 2006). Because the physical act of making art involves the synthesis of the sensorimotor and perceptual realms, it allows for a more direct expression of the traumatic memories, while simultaneously promoting the artist's autonomous engagement and sense of control (Johnson, 1987). This is in keeping with van der Kolk's (2006) assertion that neuroscience research supports the efficacy of "action-oriented" interventions (p. 204) with trauma survivors. Therefore, on both physiological and psychological levels, the bodily and life-affirming activities of the artist making art can remediate the feelings of helplessness, passivity, and annihilation experienced during the trauma.

Leclerc (2006) described a major therapeutic function of the psychoanalytically oriented art therapist as follows:

> to support, in all meanings of the term, the symbolic expression of unconscious psychic processes and to try to make these processes intelligible: first of all, intelligible to oneself and then, from the knowledge acquired through one's own psychic experience... [intelligible] to one's patients...[T]he creation of meaning is a joint construction: one of patient-image-therapist...[T]he knowledge art therapists acquire through experience does not necessarily need to be verbally expressed to their patients...[I]t can even be unethical to do so. (p. 131)

The active interventions art therapists may make during art therapy sessions range from very subtle to overt. Art therapists provide patients with an inviting range of high-quality art materials, and encourage them to become artists—often this is the first healthy and empowering identity they have been connected with since the trauma. Instead of providing pre-determined directives, psychoanalytically oriented art therapists attempt to embolden patients to create images of their own choosing in a manner resembling free association. Some patients may choose to look through reference material that the art therapist has made available, such as fine art postcards and books, to stimulate ideas or to use as a starting point for a piece of art. If a patient wants to create art but is unable to find a way to begin, suggestions may be offered by the therapist regarding possible ideas for imagery. These suggestions tend to be either directly connected to material presented by the patient, or so general and wide-ranging that there is room for the patient to select the idea or the particular medium to experiment with, promoting a sense of ownership of the decision (see Rubin, 1984).

In order to facilitate artistic expression, the art therapist may at times demonstrate artistic techniques, commensurate with the artistic capacities of the patient. In special circumstances, an example of which I will describe in the case presentation, it may be clinically indicated to actually make art for the patient (Kramer, 1986). This intensive type of intervention must be considered in the context of the impact of physical helplessness during the trauma experience. "The realization that no action can be taken to stave off the inevitable" (van der Kolk, 2006, p. 282) can induce a state of immobilization similar to the learned helplessness response of animals exposed to inescapable shock. Discussing the relevance of Seligman's finding that the learned helplessness response could often be reversed if the affected animals were repeatedly pulled into a safe area by the researchers (Seligman, 1975), van der Kolk and Greenberg (1987) wrote:

> Therapists may have to perform the psychotherapeutic equivalent of dragging the patient into a non-electrified area; that is, actively encourage the patient to take action in order to reexperience control. This can attenuate some of the chronic sense of helplessness and victimization so common in people with PTSD. (p. 74)

Whether demonstrating techniques or creating art for the patient, the art therapist typically accompanies his or her artistic activities with step-by-step verbal descriptions, in order to maintain a contextualized connection with the patient's artist-self.

The artwork is treated as an extension of the patient's self by the therapist, and the careful way it is physically handled and stored metaphorically communicates the value the therapist places on the survivor's inner world. Once the memories and feelings have been externalized in the artwork, survivors typically find it easier to talk about them, especially because the imagery provides a fertile arena for the use of metaphor and stories told in the third person (Johnson, 1987). The therapist makes it clear that a non-directive approach to talking about the artwork is essential, reinforcing the artist's sense of control over any verbal exchange. In the safe and containing environment of the office, the therapist, the artist/patient, and the artwork itself all become witnesses to the trauma. It is especially important for patients with PTSD to have a permanent record of their active involvement in the recovery process, as this decreases feelings of helplessness and safely locates the revelation of the memories within the space and time of the sessions. In the words of Laub and Podell (1995):

> art has the ability to revive the enshrouded past of a trauma through a dialogue in the present. In creating a holding witnessing 'other' that confirms the reality of the traumatic event, the artist can provide a structure or presence that counteracts the loss of the internal other, and can thus bestow form on chaos. Through such form the artist can 'know' the trauma. (p. 993)

Crossmodal correspondences

Human beings are endowed with an innate capacity to translate perceptual information from one sensory modality into another. Cognitive scientists Meltzoff and Moore, in their groundbreaking 1977 paper, documented that infants as young as 12 days will spontaneously reproduce specific facial expressions made by adults and will refine their attempts to do so with progressively accurate results over the course of several minutes. What is particularly striking about this discovery is that the infants engaged in this imitative behavior *from memory*, and without ever seeing their own faces (Meltzoff & Moore, 1977). Subsequent studies have observed that the capacity to translate visual data into imitative action exists as early as 42 min after birth (Meltzoff & Moore, 1989). Different combinations of sensory modalities can also be translated. For example, a 3-week-old infant can remember, and later recognize, a pacifier of a particular shape that she had sucked on but never seen (Meltzoff & Borton, 1979; Stern, 1985). Therefore, "the ability to act on the basis of an abstract representation of a perceptually absent stimulus becomes the *starting point* [italics added] for psychological development in infancy, and not its culmination," as had been previously proposed by Piaget (Meltzoff & Moore, 1977, p. 78).

These abstract or presymbolic representations form the mental models that comprise the implicit memory system (Fosshage, 2005; Siegel, 1999), and are encoded automatically using the infant's hard-wired propensity to register the 'crossmodal correspondences' of his or her visual, tactile, auditory, olfactory, gustatory, proprioceptive, and temporal experiences with the external world (Beebe et al., 2005; Meltzoff, 1990; Siegel, 1999). All of these sensory modalities "operate at once as a 'package,' and thus all information is potentially cross-modal" (Beebe et al., 2005, p. 33). "The infant appreciates self-other correspondences from birth" (p. 32), and the attuned caregiver shares that appreciation. As a result, interactions that involve this type of behavioral matching are motivationally reinforcing in that they "provide a common language, and special moments of connection" (p. 33). It is in this multi-dimensional way, founded on the proto-empathic premise that others are "like me" (Meltzoff & Brooks, 2001), that we come to engage with, and know, ourselves and our environment in a dyadic, intersubjective manner.

The mirror neuron system, embodied simulation, and empathy

Discovered in the early 1990s, the mirror neuron system (MNS), and the accompanying mechanism of embodied simulation, are physiological and anatomical substrates of our ability to register crossmodal correspondences (Gallese, Eagle, & Migone, 2007). Neuroscientists Gallese, Rizzolatti, and their colleagues were the first researchers to detect the remarkable fact that when a monkey observes another individual engaging in a goal-directed activity, such as eating, the same neuronal pathways are automatically activated in the monkey's premotor cortex that would be discharged *if the animal had actually performed that specific sequence of actions itself* (Gallese, Fadiga, Fogassi, & Rizzolatti, 1996; Rizzolatti, Fadiga, Fogassi, & Gallese, 1997). "Because this. . .subset of cells seemed to directly reflect acts performed by another in the observer's brain," they named these specialized brain cells mirror neurons (Rizzolatti, Fogassi, & Gallese, 2006, p. 56).

Succeeding investigations of the MNS in primates have revealed different classes of these brain cells, which all encode templates for the specific actions that make up goal-directed activities of other

individuals, and contribute to sensorimotor integration (Iacoboni & Dapretto, 2006). The crossmodal properties of mirror neurons, and their plasticity (Rizzolatti & Arbib, 1998), allow them to code abstract, sensory-based elements of the actions of others in a manner that can evolve over time. For example, a monkey's MNS template for breaking open a peanut is activated not only in response to the sight of a researcher breaking a peanut, but also in response to *just the sound* of a peanut being broken, once that sound has been integrated into the template (Iacoboni & Dapretto, 2006; Kohler et al., 2002). In addition to facilitating imitation and the understanding of the meaning of an act, the MNS is also able to encode the particular intention or goal that is associated with the observed action, such as the intent to eat a peanut or to place it in a cup (Iacoboni & Dapretto, 2006). Once this goal has been registered, it can be used to predict an individual's next action (Gallese et al., 2007). "This neural mechanism for intention understanding seems to be a basic form of *understanding the mental states of others* [italics added]" (Iacoboni & Dapretto, 2006, p. 945).

Ensuing research has demonstrated the existence of a mirror neuron system in human beings. Also located in the premotor cortex of the brain, it is hemispherically bilateral, and operates in response not only to the observation of goal-directed behaviors but also to the conveyance of emotions through facial expressions and body language (Carr, Iacoboni, Dubeau, Mazziotta, & Lenzi, 2003; Iacoboni & Dapretto, 2006). "Mirror neurons provide an inner imitation, or simulation, of the observed facial expression. They send signals through the insula to the limbic system, which provides the feeling of the observed emotion" in the observer (Iacoboni, 2008, p.119). Moreover, Carr and colleagues (2003) found that this response is heightened when the observer overtly *imitates* another individual's facial expression, and shows a "right lateralized activation of the amygdala" (p. 5501). They concluded that "the type of empathic resonance induced by imitation does not require explicit representational content and may be a form of 'mirroring' that grounds empathy via an experiential mechanism" (pp. 5501–5502).

A particularly intriguing discovery is the presence of mirror neurons in humans that respond to hand gestures and facial expressions, registering the response in Broca's area, the part of the left hemisphere of the brain previously believed to be exclusively involved in speech production (Gallese, 2007a; Rizzolatti & Arbib, 1998; Rizzolatti & Craighero, 2004). The genesis of spoken language appears to be connected to the ability to read gestures and facial expressions. Rizzolatti and Arbib (1998) proposed that "the precursor of Broca's area was endowed, before speech appearance, with a mechanism for recognizing actions made by others. This mechanism was the neural prerequisite for the development of inter-individual communication and finally of speech" (p. 190). They went on to state:

> It is likely that the human capacity to communicate beyond that of other primates depended on the progressive evolution of the mirror system in its globality. Congruent with this view is the observation by Donald (1991) that mimetic capacity, a natural extension of action recognition, is central to human culture (such as dances, games and tribal rituals) and the evolution of this capacity was a necessary precursor to the evolution of language. (Rizzolatti & Arbib, 1998, p. 192)

These propositions, made in relation to the evolution of our species and supported by data regarding the MNS, embed the crossmodal registration of observed action and non-verbal emotional expression within the realm of verbal expression. As Wolf, Gales, Shane, and Shane (2001) pointed out, this brings the left-hemisphere into the implicit domain, which has typically been thought of as being intrinsically connected to right-hemisphere functioning. This informs our understanding of the neurobiological function of 'joint referencing' or 'joint attention' activities, essential during language acquisition in childhood, in which the baby/parent dyad "is able to communicate about a third person or object through a combination of orofacial and manual gestures, the meaning of which may or may not be shaded by accompanying vocalizations" (pp. 101–102). Furthermore, Rizzolatti and Craighero (2004) have documented that simply listening to sentences that describe actions activates the visual-motor mirror neurons that represent those actions in the brain of the listener. Other studies have shown that the act of making gestures oneself enhances the capacity both to comprehend (Glenberg & Kaschak, 2002) and to verbalize (Bernardis & Gentilucci, 2006) linguistic material related to the meaning of the gestures.

These scientific discoveries significantly enhance our understanding of the efficacy of certain art therapy interventions. For example, when the therapist verbally describes each action when demonstrating how to draw a particular image, the patient's mirror neurons may be engaged in a manner that promotes the successful internalization of the skill. When the therapist and artist/patient look together at a piece of art that is being held at a slight distance—a form of joint attention—the emotional support manifested by the gestures and facial expressions of the therapist, and the gestural acts of the patient, may activate the patient's left hemisphere, thereby facilitating verbal expression.

Gallese (2003, 2004, 2007a, 2007b) employs the term 'embodied simulation' to describe the automatic, implicit, and unconscious internal modeling experience that occurs when we observe the actions, emotions or sensations of other people. "Mediated by the activation of the mirror neuron system" (Gallese, 2007a, p. 661) in consort with other neuronal pathways, this sensorimotor-based simulation is not "the result of a willed and conscious cognitive effort, aimed at interpreting the intentions hidden in the overt behavior of others, but rather [is] a basic functional mechanism of our brain" (Gallese, 2004, p. 4). Embodied simulation, in that it "enables the observer to use his/her own resources to penetrate the world of the other without the need of explicitly theorizing about it" (Gallese, 2003, p. 174), produces a "shared body state" (Gallese et al., 2007, p. 144) that is the neural basis of the development of empathic attunement (Gallese et al., 2007). As such, the MNS and embodied simulation facilitate the capacity for imitative learning, internalization, and identification, on a continuum that connects the deepest forms of empathy on one end to the most brutal expressions of identification with the aggressor on the other (Wolf, Gales, Shane, & Shane, 2000; Wolf et al., 2001).

The derivation of the word 'empathy' should resonate with art therapists, since it originated in the domain of aesthetics in a manner that is consistent with the neurophysiological data described above. As several authors (Freedberg & Gallese, 2007; Gallese, 2003; Pigman, 1995) point out, empathy is a translation of the German word '*Einfühlung*,' which literally means "feeling-into." It was coined in 1873 by art historian Robert Vischner to describe his awareness that bodily experiences are induced by the act of looking at works of art and elements of nature, and that this kind of kinesthetic involvement—in his words, "unconscious imitation"—enhances the observer's emotional engagement with the artwork or scene (Pigman, 1995, p. 240). Vischner's intuitive insight has received scientific validation. In their discussion of the aesthetic experience of objects, Freedberg and Gallese (2007) described that "the observation of a graspable object leads to the simulation of the motor act that the object affords" (p. 200). Furthermore, the *implied* motion captured in a static image of a hand in the process of moving has been shown to activate the corresponding motor representation in the premotor cortex of the observer (Urgesi, Moro, Candidi, & Aglioti, 2006). Freedberg and Gallese therefore asserted there is ample empirical evidence to suggest that the mirror neuron system and embodied simulation are activated in the brain of an observer *viewing a work of art*. They believe that this

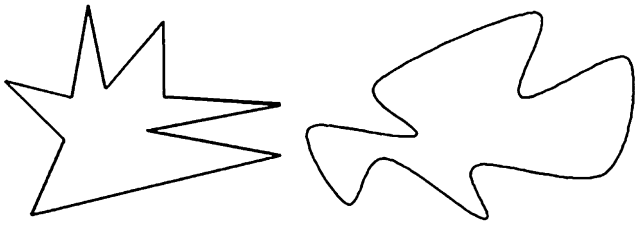


Fig. 2. Which shape is called 'bouba' and which is called 'kiki'?

occurs in response not only to the objects, actions and emotional content depicted in the piece, but also to the implied goal-directed gestures or movements involved in its creation. For these reasons, *empathic responses to works of art are "not purely introspective, intuitive or metaphysical but [have] a precise and definable basis in the brain* [italics added]" (Freedberg & Gallese, 2007, p. 199).

These discoveries have important implications for art therapy. They indicate that, on an embodied simulation level, the act of creating a piece of art can be induced by being in the presence of such graspable objects as art-making materials, looking through reference material, and watching and listening to an art therapist or other members of an art therapy group making art. Because "hand gestures and mouth gestures are strictly linked in humans, and . . . this link includes the orolaryngeal movements used for speech production" (Rizzolatti & Craighero, 2004, p. 185), one can logically assume that the gestural acts involved in creating a piece of art could themselves activate the artist's MNS in Broca's area, enhancing the possibility for later verbalization.

The mirror neuron system and metaphors

Freud (1923/1961) succinctly stated, "the ego is first and foremost a bodily ego" (p. 26). In describing the connection of bodily experience to metaphor, Shengold (1981) wrote:

> Metaphor provides a repetition of the earliest *body-affect*-laden connections and differentiations between the inner and the outer world and evokes the earliest experiential feelings of inside and outside, the awareness of the existence of self and things. When these connections approach some of their primal fervid quality in our consciousness, without jeopardizing our integrative powers, we can speak of insight. Metaphor that leads to insight supplies a factor of conviction of real experience about the past. Metaphor leads to memory. (pp. 303–304)

As Ramachandran (2006) pointed out, "that most quintessentially human trait, our propensity for metaphor, may be partly based on the kinds of crossdomain abstraction that mirror neurons mediate; the left hemisphere for action metaphors ('get a grip') and the right for embodied and spatial metaphor." In the visual-to-verbal realm, the 'bouba-kiki effect' provides us with a striking demonstration of our hard-wired capacity for crossmodal, synaesthetic transformations. Tested around the world since it was designed in 1929 by Köhler, it is now understood in the context of the functioning of mirror neurons and embodied simulation (McGeoch, Brang, & Ramachandran, 2007; Ramachandran & Hubbard, 2001).

When shown Fig. 2, and asked to name one of the abstract shapes 'bouba' and the other 'kiki,' an "overwhelming majority of people (regardless of language, alphabet or culture) will attach the names kiki to a spiky jagged shape and bouba to a gelatinous amoeboid shape," (McGeoch et al., 2007, p. 1166). As Ramachandran and Hubbard (2004) hypothesized:

> the gentle curves and undulations of the amoeba-like figure metaphorically mimic the gentle undulations of the sound 'bouba' as represented in the hearing centers of the brain and the gradual inflection of the lips producing the curved 'booo baaa' sound. The waveform of the sound 'ki ki' and the sharp inflection of the tongue on the palette likewise mimic the sudden changes in the jagged visual shape. This experiment suggests a deep connection between the auditory and visual stimuli and suggests that these properties map onto each other in a non-arbitrary manner. (p. 30)

This depiction of the relationship of the MNS to metaphoric expression provides an additional way to understand the findings of Spring (2004), who conducted a 30-year study of "recurring graphic forms" in drawings produced by survivors of rape (p. 200). She found that, in the context of different types of self-portraits, "a significant statistical difference exists in the frequency and distribution of *wedges* and *disembodied eyes* [italics added] between women who experienced sexual abuse and women who did not" (p. 205). From a crossmodal, embodied simulation perspective, we can conjecture that the explicit experience and implicit memories of having one's body violently penetrated could be translated into sharp, wedge-like shapes that visually cut through the plane of the paper. Disembodied eyes are notable for their distinctly vulvar shape, and the presence of circular pupils could be a visual, body-based metaphor for the vaginal, anal or oral orifices that were violated. This is consistent with Spring's finding that "the most frequently observed pattern in victim drawings was disembodied eyes and wedges together in the same drawing" (p. 204).

The mirror neuron system, embodied simulation and trauma

Wolf and colleagues (2000) contended that the neurophysiological findings regarding the mirror neuron system and embodied simulation can deepen our understanding of the trauma response. As described above, the MNS is intimately linked to the construction of the mental models that make up the implicit memory system, which include "*emotional* patterns that are encoded non-verbally" (p. 415).

> Given that mirror neurons immediately encode an image and learn to either imitate it or respond to it with immediate input to the motor system, we can see then how the mirror neuron system fits with. . . other memory mechanisms to allow for immediate response to trauma or remembered trauma. Consider how important [the MNS] would be to respond in a 'fight or flight' situation. The mirror neurons would account for the rapid capacity of the motor system to act. As they have the capacity to retain the 'value' of the action observed and practiced, they seem important to implicit-procedurally mediated learning and actions. (p. 416)

The rapid assessment of traumatic experience afforded by the MNS could also lead the person being traumatized to 'freeze' in a dissociative state, since in certain situations, the more active responses of 'fight or flight' would "predictably entail an increasingly aggressive behavior on the part of the [unequivocally more powerful] predator" (Frewen & Lanius, 2006, p. 116). In addition, in the post-trauma state, mirror neurons may also activate in response to *internal* cues such as flashbacks (Wolf et al., 2000), causing the same kinds of fight–flight–freeze responses.

According to Greatrex (2002), "the discovery of mirror neurons may add another dimension to our understanding of why enactment, meaning the spontaneous repetition of behavior and feeling, is a crucial precursor to the symbolic act of remembering" (p. 194). He pointed out that this is consistent with Loewald's (1980) assertion that "internalization . . . is conceived as the basic way of functioning of the psyche, not as one of its functions" (p. 71). Regardless of the type of survival strategy that is used during interpersonal

trauma, there are disturbing implications for the survivor in that the functioning of his or her MNS produces a "shared body state" with the perpetrator through the process of embodied simulation. In other words, the perpetrator's malevolent actions and emotions are automatically embedded in the mind of the survivor, as if the survivor had also committed the traumatic acts.

This finding helps to elucidate our understanding of the defense of identification with the aggressor, which is ubiquitous among survivors, and readily acknowledged by clinicians. Wolf and colleagues (2000) described the way the MNS "provides one neurobiologic mechanism whereby an observed action becomes automatically, non-consciously self-generated" (p. 421), setting the stage for the intergenerational transmission of trauma. What is often overlooked is the sense of guilt engendered by conscious or unconscious fantasies of revenge against the perpetrator. These fantasies may feel especially dangerous and shameful because they heighten the survivor's already unconsciously embodied sense of feeling like a criminal, making it even more difficult to distinguish between the self and the abuser. It is also relevant when considering the self-destructive tendencies of many trauma survivors, who may, in part, be unconsciously attempting to punish their implicitly internalized perpetrators.

In this context, Johnson's (1987) description that psychological trauma results in "the feeling that one's humanity has been compromised, that one is cut off from the community of people, that one has been forever soiled, marked as an outcast, or turned into a beast" (p. 8), becomes especially poignant. The activities of the MNS and embodied simulation corroborate, on a neurobiological level, his formulation of the concept "being the other" (Johnson, 1998, p. 93), which depicts the survivor's unconscious, symptomatic acting out of the omnipotent internalized abuser. In this traumatized state, "fantasy becomes an activity to be avoided.. . .Fantasy, instead of providing [the survivor] with a safe haven or a harmless playground within the personality organization, is consciously suppressed because, unconsciously, omnipotence renders it dangerous" (Oliner, 1996, p. 291).

From a treatment perspective, because the MNS demonstrates plasticity and can integrate new information, the implicit memory system "and its affective connections can be modified through positive new experience. In addition, the traumatic implicit-procedural pathways become minimized or extinguished, replaced by pathways that move in a more positive direction" (Wolf et al., 2000, p. 421). Gallese and colleagues (2007) suggested that "the patient's embodied simulation of the therapist's attuned response has the potential to clarify and articulate the patient's own feeling state and therefore can itself contribute to self-integrity" (p. 159). In describing what the therapist's "attuned response" would look like, these authors emphasized that it "is not simply a *representational replica* [italics added]" (p. 162) of the behavior and feeling state of the patient, but a slightly modified, "more manageable version" (p. 149)—a version that promotes the possibility of transformation and healing when the patient takes it in.

When the traumatized patient, in the state of "being the other," begins creative arts therapy, he or she is brought by the therapist into the "arts/playspace," where "constraint against harm remains one of its defining conditions" (Johnson, 1998, p. 93). This provides the survivor with the opportunity to begin "portraying the other" (p. 93)—the perpetrator—through the use of the third person and the symbolic, artistic depiction of the internalized perpetrator's acts. "The canvas, the dance, the song, the drama and the poem reveal the evil that could be chosen, but is not" (p. 94). When "the other" can be safely externalized, there is then the possibility of "portraying the self" (p. 95), in all its vulnerability, rage and pain. The experience of being separate from the perpetrator in the symbolic realm sets the stage for being able to move into the state of "being the self" (p. 96). Here, the goal is to help the survivor "integrate the transformed experiences made possible by the therapeutic process into a renewed sense of self. This important re-internalization occurs as the previously blocked processes of mourning and reparation resume" (p. 96).

Introduction to the case

Meeka, a 26-year-old, married black female, was referred to a psychiatric outpatient clinic during her ninth month of pregnancy. Born and raised in a West African country, Meeka and her husband, "Saki," both practicing Muslims, had moved to the United States as newlyweds. Meeka had earned a college degree in fashion design before emigrating and hoped to pursue more training and eventually a career in that field. She described herself as a confident and outgoing person with many friends, who was happy in her marriage, close with her family, and well-adjusted to her move to this country.

On a Friday afternoon, Meeka, in her seventh month of pregnancy, was alone at home. Responding to her doorbell, she signed for a small package addressed to her husband, that a Postal Service employee delivered. Although she did not know it at the time, the package contained an herbal remedy for morning sickness that her husband's relatives in Africa had sent as a gift. Meeka called Saki at work and was speaking with him when the doorbell rang again a few minutes later. Setting the receiver down, she opened the door, and eight or nine men with guns drawn pushed their way into her apartment. Some of them forcefully pinned her against the wall and repeatedly screamed, "Where are the drugs?" as the others ransacked the apartment. It was only when a drug-sniffing dog was brought in by a uniformed officer that Meeka realized the intruders were undercover police and not criminals. One of the officers picked up the dangling receiver and said, "We're taking her to jail," before hanging up on Saki, who had been helplessly listening to the commotion and his wife's screams. After enduring the previously described body-cavity search, Meeka was ordered to change out of her nightgown and into street clothes. She was arrested and taken to a nearby police station.

During the course of the next 48 h, Meeka was held in six different prison cells around the city, and was not allowed to make any phone calls. Because the arrest had occurred late in the afternoon on a Friday, after the close of administrative offices for the weekend, Saki was forced to travel from precinct to precinct in an effort to find her. She did not eat or sleep. On Sunday night, just as she was finally being allowed to make her first phone call, Saki located her and she was released. In court a month later, it was reported that no illegal substances had been discovered in the apartment, and all charges against her were dropped. A multi-million dollar lawsuit was filed on Meeka's behalf.

After her release from prison, Meeka's midwife referred her to the outpatient psychiatry department of the public teaching hospital where I worked. During the intake evaluation Meeka was found to be suffering from every symptom of PTSD delineated in the DSM-IV—symptoms so debilitating that she was living like a virtual prisoner in her own home. She also reported some anomalous symptoms, such as sustaining short periods of "blacking out," and feeling "fearful" about eating. She expressed concern about the toll that these symptoms were taking on her marriage.

When Meeka returned for treatment after her baby was born, she was placed on imipramine at night, and she and Saki were initially referred for couples therapy. In the context of a family therapy seminar, Meeka and Saki, with their baby, attended 11 sessions with two psychology interns over a period of four months. Behind a two-way mirror, a team of interns and clinicians, of which I was a member, observed the sessions and occasionally intervened with questions and suggestions by phone. Meeka and Saki were able to identify a range of feelings related to the trauma, though there was

a noticeable absence of affectively laden expression. For example, they discussed: their anger that the event had changed their lives and strained their relationship; their rejection by their West African community, whose members believed that only guilty people go to jail; and their own shame about being in therapy, which they thought was reserved for "crazy" people. However, the couple verbalized frustration at the slow and unpredictable rate of recovery, and Meeka began to say that she was feeling increasingly discouraged and depressed.

When the couple was informed of the upcoming end of their therapists' rotation, Meeka became visibly upset at the thought of having to start over and tell her story again to someone new. The team decided that I would take over the case, and Meeka responded well to the dramatic intervention of my appearance from behind the mirror. Because Saki was about to take on a second job and would no longer be able to attend sessions, we agreed that Meeka would begin individual treatment.

The first drawing

Meeka came to her first individual session with her baby, who slept in her arms. We reviewed her symptoms, and in response to my questions, her descriptions became more explicit. For example, she revealed that she feared that bullets would come flying through the windows of her apartment. This was followed by a detailed story concerning the death of her father, one of a number of earlier traumas that may have predisposed her to developing PTSD.

She said that her father, a successful businessman, had been fatally poisoned by his partner. Though he had not been a suspect, a few weeks after the murder, the partner ran through the streets confessing his guilt, and was stoned and clubbed to death by the townspeople. Meeka's mother, who was pregnant with Meeka at the time, unsuccessfully attempted to kill herself with an overdose of pills, and was sure that she had damaged her baby *in utero*. However, Meeka was born healthy and intact, and as a result, Meeka said, "My mother saw me as a god and worshipped me." I wondered to myself if Meeka's anxiety about eating and her fantasies about bullets might have been metaphorically connected to the poison that killed her father and the stones that killed his murderer, respectively.

Following these revelations, as our first session drew to a close, Meeka said softly, "But you know, there's a lot I can't talk about. And I'm worried about so many things." After I explained that art therapy might help her express and work through some of her worries, she told me she would leave her baby with a sitter during future sessions so she could "concentrate."

Meeka missed a session because of a viral infection, and came to the next one reporting an increase in fear and anxiety at night since her husband had begun his second job, which was on the night shift. As she looked at the art materials arranged on the table in front of her, I explained that she could draw whatever came to mind. Meeka drew Fig. 1, working for about 20 min in a quiet and focused manner, and erasing frequently.

She initially drew a nude figure, and then added a loose skirt before changing it to a form-fitting one. When she said she had finished, I asked if I could hold up the drawing so we could look at it together, and I wondered out loud if there was a story that went with the picture. As described above, using the third person to safely distance herself from the traumatic, autobiographical elements of the drawing, Meeka said flatly, "This is a woman dressed up and going to work. She's upset, probably about something going on at home." Meeka did not wish to elaborate, and I let her know that artists have the privilege of deciding what, if anything, they want to say about their artwork. She nodded solemnly, and accepted a blank journal and some simple art supplies to take with her, having agreed to try drawing a soothing image when she felt anxious at home.

Analysis of the first drawing and interventions

Like a first dream in an analysis, a first drawing in an art therapy context can symbolically express the patient's core issues. There is a high level of anxiety that is indicated by the choppy line quality throughout much of the drawing. The gray cloud of hair appears to be almost standing on end, as if lifting off to reveal the woman's ears—ears that have heard too much and must now listen too carefully—as well as her bald skull, a metaphoric expression of a loss of identity and the sense that her brain has been made vulnerable, all typical components of the post-trauma state. The woman is floating and ungrounded, and seems off balance as she stands in a precarious, helpless position that resembles the position Meeka was in when she was pinned against the wall by the police. The stiff posture and the multiple straight lines give the figure a robot-like quality, hinting at feelings of depersonalization. The masculine shape of the chest, with its broad shoulders and the omission of any sign of breasts, can be read as a subtle portrayal of an internalized perpetrator. The fact that she drew the figure in the nude before adding clothes, and then erased the looser skirt and redrew a tighter, more revealing skirt, may express her confusion about gender and sexuality. Meeka's own dark brown skin color is relegated to the edge of the figure's neck and lower arms, an allusion to what she would later reveal about her sense of the relationship of her race and ethnicity to aspects of her trauma.

The emphasis on the colorful and unusual design of the clothes may connect with Meeka's life-affirming wish to return to her pre-morbid interest in fashion and level of functioning, especially since she stated that the woman is "going to work." This could also be a metaphor for beginning the "work" of individual therapy. Her use of bright colors seems to simultaneously defend against the feelings of depression that hover over her mind like a dark cloud, while also indicating that she is full of intense emotions that she experiences on a bodily level. The design of the outfit visually captures the sense of bodily fragmentation that is a common result of trauma. The figure's vacant eyes gaze uneasily to the side, avoiding the viewer. This may represent the experience of having seen too much and the concurrent need to dissociate during trauma in order to survive. In contrast, Meeka's hypervigilance seems to be symbolized by the eye-shaped belt and bracelets. These symbolic eyes, though not literally disembodied (as described by Spring, 2004) are displaced downward to the waist and wrists at the vicinity of the groin, and may also be read as vulvar metaphors. Again, perhaps the most striking visual elements are the sword-like shapes that point to her groin, which can be understood as the crossmodal expression of her having sustained the invasive body-cavity search—an especially traumatizing and physically dangerous experience given Meeka's advanced state of pregnancy. This is subtly reiterated by the short, straight orange line reinforcing the inside edge of the orange panel. Placed exactly at groin-level, this line could represent a rip in the skirt, symbolizing the vaginal and anal penetration Meeka was forced to endure.

This outpouring of explicit and implicit information in our first two individual sessions was certainly facilitated by Meeka's introductory phase of treatment with her husband. Knowing that I had been "watching over her" from the other side of the mirror (as she later told me) may have also contributed to her ability to engage in our work so quickly. Religious/cultural beliefs, along with the circumstances surrounding her father's murder (including her mother's suicidal/homicidal response to her husband's death), left Meeka with particularly strong associations of success with pun-

ishment. The eerie repetition of both mother and daughter having sustained profound trauma when pregnant with their first child must have also exacted its toll. Her mother's guilt about almost killing or damaging Meeka before her birth set the stage for a childhood during which Meeka, worshipped as a "god," was not taught to manage her own aggressive and omnipotent feelings in safe ways.

The second drawing

In our third session, Meeka spoke about her hypervigilance and difficulty sleeping, stating that the only nights she slept through were the ones when her husband was at home. She also spoke of a marked increase in their marital discord. However, she had been drawing in her journal (mostly geometric abstracts) and seemed to be beginning to develop self-soothing abilities. After a brief silence, her eyes filled with tears. She then told me she was "filled with scary feelings," but did not know how to describe what was happening to her. I asked her if she might want to try to use the art materials to represent something about her distress, and she drew Fig. 3.

She told me this was a picture of "a very depressed and angry woman." She haltingly went on to say, "She's being robbed at gunpoint by a man who is threatening to kill her if she tells anyone about the crime." I asked about what seemed to be a knife, and Meeka said that the woman "had thought about killing herself, but knew that she wouldn't because she had too much to live for." Alarmed at the detail and content of this story, I broke the metaphor and asked Meeka if something like this had actually happened to her during her ordeal. She said no, and, after I had assessed that she was not actively suicidal, we talked about how the drawing represented her feelings of being overwhelmed by her problems. I framed the drawing with a ready-made frame in an effort to visually and symbolically contain the dangerous feelings depicted in it. As Meeka left the office she said that she felt relieved to be able to talk about these things.

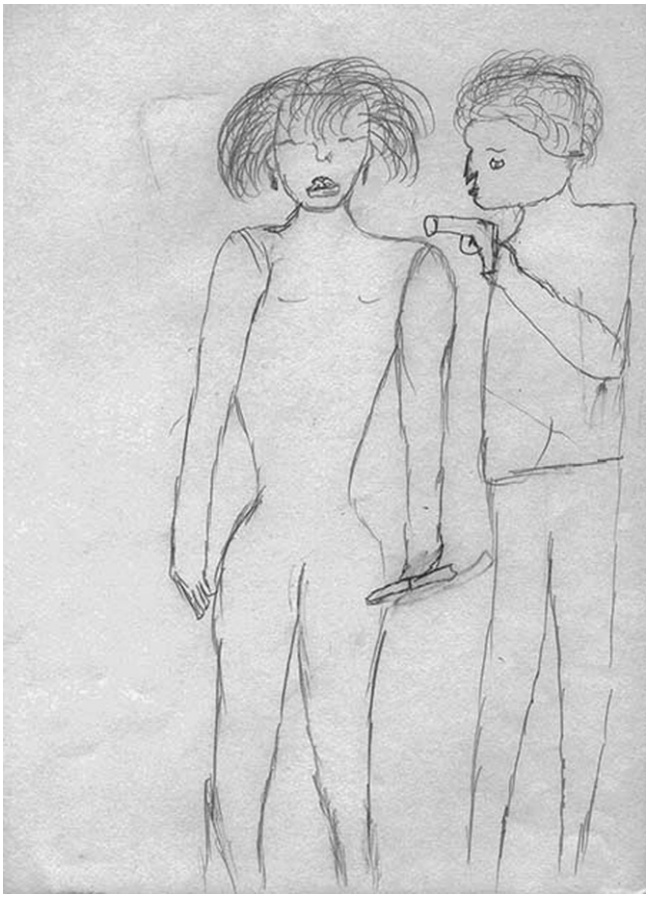


Fig. 3. The second drawing: "A very depressed and angry woman. She's being robbed at gunpoint by a man who is threatening to kill her if she tells anyone about the crime."

Analysis of the second drawing and interventions

Meeka progressed from using the third person to describe the woman in Fig. 1 as being merely "upset," to being able to tell me directly that she herself was "filled with frightening feelings." Though she then returned to the third person when talking about the "very depressed and angry" woman in Fig. 3 who, she said, had considered suicide, she also portrayed a perpetrator. This drawing can be viewed as a metaphor for her inhibitions about openly describing her experience and feelings. She seems to believe that she will be punished for these confessions. In the drawing, she may also have been revealing that the trauma itself may have been experienced as a punishment for previous transgressions.

There is a high level of anxiety indicated in the choppy line quality of both figures, and aside from the sleeve line at the shoulders, the female figure is nude and vulnerable. With legs that fade off into nothing, action or escape is impossible. Both victim and criminal have weapons, yet neither has a true grasp of them as the hands are omitted. Meeka has made a foray into "portraying the other." However, the sad, worried, and tentative expression of the male aggressor offers a striking contrast to the life-threatening crime he was engaged in. It resembles Meeka's own expression as she drew and as she talked about the picture. In this way, the man can be seen as both the internalized perpetrator and also as a split-off part of Meeka, tormented by fantasies of revenge and attempting to assuage her guilt about these fantasies by turning the rage against herself with suicidal ideation. There is a sexualized, self-destructive element indicated by the way the knife was drawn, as it seems to move back and forth near the female figure's groin—a more explicit symbol of bodily violation than the abstract wedge shapes in the skirt of the first drawing. Finally, this threatening figure may also represent me, the therapist, as someone who Meeka may have felt was putting her in danger by asking her to reveal frightening feelings.

I believe that the combination of Meeka's affective state, her first person and third person verbalizations, and her facial expression and the expressions on the faces of the figures, induced me, on an embodied simulation level, to break the metaphor. This let Meeka know that I took her feelings and her safety very seriously. Once it became clear that she was not actively suicidal, we could return to the containing quality of the metaphoric "arts/playspace." Watching me frame her drawing may have activated her mirror neuron system, giving her an implicitly felt sense that she, too, was able to safely manage her distressing feelings and fantasies.

The third drawing

Meeka missed the next session, calling me to report that she felt weak and shaky because she had been unable to sleep for many days. She arrived at the clinic the following week looking extremely depressed. She spoke about her insomnia, frequent headaches, and poor appetite. She then said that she had a headache and did not want to talk or draw. We sat together in silence for several minutes. Her posture on the couch was such that she seemed folded into herself, her head hanging as if pressed down by a huge weight of shame. I became aware of my own feelings of helplessness, which felt physically oppressive, and eventually noticed that I, too, had

unconsciously sunk down into my own chair. I then felt a surge of anger at the police who had arrested her, which seemed to compel me to sit up straight.

I asked Meeka softly if she ever felt angry with the men who had taken her to prison. She raised her head and slowly straightened her spine, made direct eye contact with me for the first time that day, leaned forward, and whispered, "I'm not the murdering kind, but if I were, I would kill them for what they have done to me." She then sank back down into the couch. Her response to my suggestion that perhaps she could make a drawing about these feelings was a mumbled, "I can't draw today." I told Meeka that I could draw for her if she thought that would be helpful, and she smiled weakly and nodded. I suggested that it seemed that she wanted to imagine these police going through the same type of terror that she had experienced at their hands, and that a drawing would be a safe way to express this. Sitting next to her, I asked her to describe one of the men in a way that could make him represent all of them. In response to her description, I drew a picture of a tall, muscular man with short hair and a suit, narrating what I was doing during each passage of the drawing. At Meeka's request, I gave him a frightened facial expression, with his arms up in the air, "Like he's under arrest." I asked her, "Where do you want him to be? In jail, perhaps?" To my surprise, she said assertively, "No, in my apartment." I told her in that case, we needed to keep her safe in this imaginary scene, and offered her the possibility that we could shackle him to the wall. She nodded vigorously, and I added the shackles. Now he was helpless, I said, just as she had been during her arrest and imprisonment.

I asked Meeka what should happen next. She whispered that she would like to "beat him up," adding, after a pause, "with a baseball bat." When I gently offered her the pencil, she told me she wanted me to draw her. I responded, "Perhaps if I begin, you can take over and finish the drawing?" She agreed, and as she described how she wanted herself to look, I added her in the act of swinging the bat, pregnant and wearing a long nightgown (Fig. 4a).

When I finished, she readily took over (Fig. 4b), completing her face, and coloring in the figures. *[Fig. 4a was re-constructed in order to depict how 4b, the final image, evolved.]*

I then asked Meeka what she would like to be able to say to this man, and she wrote:

> You son of a bitch, you deserve to die, you are a monster. Is it 'cause am from Africa, you think you can get away with this? By the time I finish with you, you will be in another planet. I will never forgive you, my daughter will never forgive you 'cause of the punishment you gave her when she is unborn. My husband too. You bastard.

Meeka requested that I read this out loud, and then she did the same. I asked her how it felt to express these feelings, and she responded by writing:

> I know and am very sure I gonna be okay. I will not let you and the others ruined my life. I still have a bright future ahead of me. I love my baby, my husband and my family, and I will not let go of them. They need me and am going to be there for every one of them. Absolutely.

After putting down the pencil, she spontaneously read the words with passion, as if she were speaking directly to the perpetrators. She then reinforced the boundaries of the Meeka figure's arms in dark brown, an apparent expression of her growing sense of efficacy and ability to own her identity. Finally, to indicate that this story was taking place in her apartment, she decided to add the image of the room divider on the left. She told me that prior to the incident, one of her favorite pastimes had been to shop for knick-knacks to display on its shelves, but she had since lost her interest in this. We ended the session with Meeka stating that she wanted to try to purchase a new item to place on the room divider, after which she exclaimed dramatically, "My headache is completely gone!"

Analysis of the third drawing and interventions

While in many ways this drawing speaks for itself, it is striking that Meeka's profile in this picture closely resembles the profile of the criminal in her second picture, as seen in Fig. 5, with the noteworthy change in expression from sad and tentative to angry and assertive.

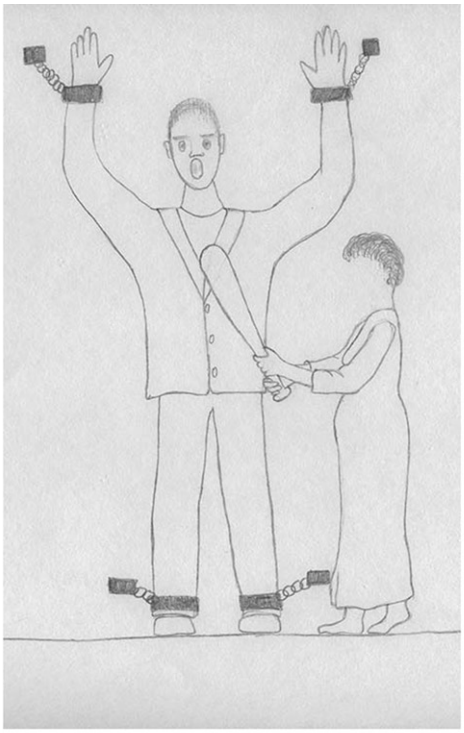
This supports my conjecture that Meeka's internalized perpetrator and her previously repressed or dissociated fantasies of revenge had made her feel like a criminal, in league with the police who had traumatized her so egregiously. She arrived at my office in what could be described as a state of learned helplessness, seemingly the result of sleep deprivation exacerbated by the bubbling up of feelings that had begun to surface in the previous session. Pally (2001), citing Schore (1994), described the way the affective and postural expressions of shame, as evidenced by a child's lowered head and complete gaze aversion, "activate in the caretaker a repair response to reconnect and soothe the child" (p. 75). Having unconsciously mirrored Meeka's posture, my embodied simulation of her helplessness and my desire to find a way to connect with her allowed me to access my own feelings of anger about what had been done to her. In doing so, I was physically and emotionally energized, and able to formulate the question she needed me to ask: "Do you ever feel angry with the men who took you to prison?" Meeka, in turn, was momentarily imbued with the courage to physically rise up and explicitly reveal her whispered wish for revenge.

By drawing for her when she could not, I physically brought Meeka into the safety of the arts/playspace, performing the type of intensive intervention van der Kolk and Greenberg (1987) suggested. Her murderous fantasies could then be symbolically represented in "an intermediary zone. . .where external reality and unconscious fantasies are integrated in such a way that neither becomes the absolute master" (Oliner, 1996, p. 294). The acts of verbally describing for me what she was visualizing, watching me draw, and listening to my voice as I worked, would have activated multiple mirror neuron pathways in her brain.

My suggestion that we might place the perpetrator in jail seemed to embolden Meeka to assert that she wanted him to meet his fate at the scene of the original crime: her own apartment. This choice may also have indicated a need to avoid thinking about her experiences in jail, which we had not begun to process. By suggesting that the officer should therefore be shackled to the wall, I explicitly modeled for Meeka that aggressive fantasies could be played with, and that even in this fantasy space I would ensure her safety. (In retrospect, since the bracelets from the first drawing resemble shackles and handcuffs, this may have unconsciously influenced the content of my suggestion.) The choice of a baseball bat as her weapon may be seen as a Westernized version of the sticks that were used to kill her father's murderer.

Once Meeka was able to take over, symbolically expressing her rage in affect-laden color on a pictorial level, she moved into the verbal realm: first in written form, and then speaking her poignant words laying claim to her right to transcend her trauma for us both to hear. As the boundaries between her self and the aggressive other were delineated, she felt free to use the first person. Finally, in the center of the wall unit, a small figure appears to be embedded in what Meeka described as the stereo. This tiny figure, watching the violent scene of the fantasized revenge, could represent a dissociated part of her self during the trauma. It could also represent me, as the person who brought

(a)



(b)

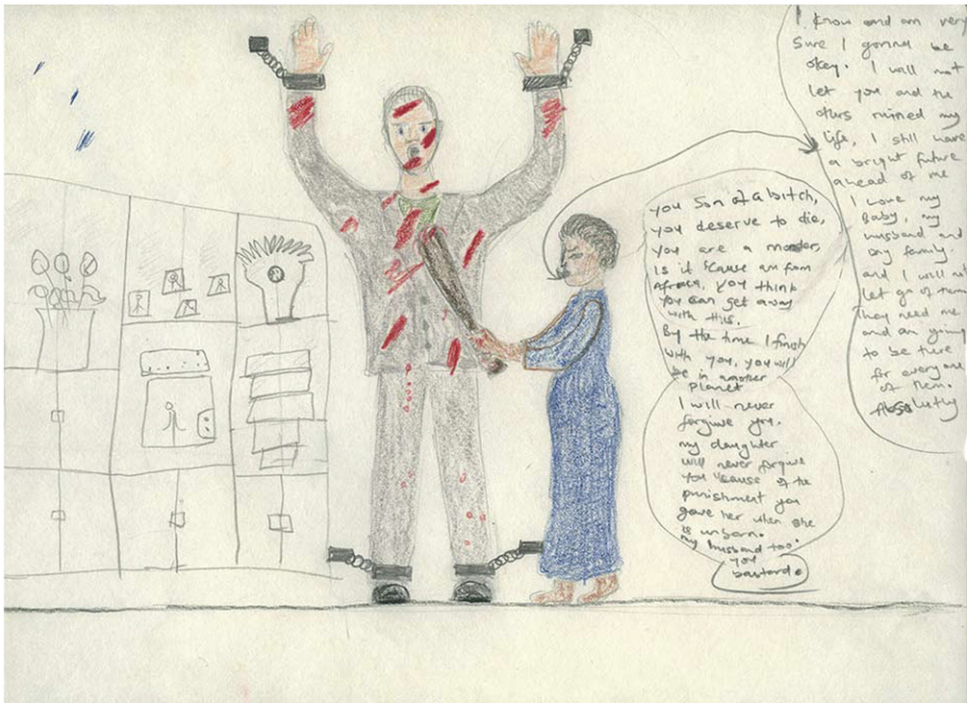


Fig. 4. (a) Reconstruction of the art therapist's intervention: facilitating Meeka's expression of her previously repressed revenge fantasy. (b) The third drawing: Meeka's revenge fantasy.

these feelings into consciousness and as the therapist in the role of witness.

The fourth drawing

During the weeks following the session just described, many of Meeka's symptoms began to decrease in intensity. Around the first anniversary of the trauma, she regressed, describing herself as bored and lonely, watching TV all day long. She said that any sexual advance her husband made caused her to feel ashamed and disgusted. She knew this "had something to do with the jail cells," but she did not know in what way. All she could remember about her 3 days in prison was that she had "cried on the cot," and was ultimately allowed to make a phone call only after she told a guard that she was going to kill herself. After a short silence, she told me that she had just recalled a vague memory of overhearing her cellmates in one of the holding cells, "prostitutes and drug addicts," speaking lewdly about sex. After this disclosure, she closed her eyes

Fig. 5. Comparison of the profile of the criminal depicted in Fig. 3 with Meeka's self-portrait in Fig. 4b.

and shook her head, as if trying to rid her mind of the memory, and reported that she had just had "one of those times when things go black." I said that we might be able to know more about these experiences when she was ready.

She missed our next session due to illness. These regular absences could have indicated immunosuppression secondary to PTSD; they could also have served to regulate the intensity of the treatment. When we met again, she reported that her marriage was in danger because of her lack of interest in sex. She said she was now sleeping on the living room couch, and she knew that she was starting fights with Saki to keep him away. I reminded her that in our last session she had connected her need to keep her distance from her husband with something that had happened in jail, and asked her if she might try to draw an image of what it was like in to be in the prison cells. She then drew Fig. 6, which she described as a picture of herself looking out of her cell with her back to "an animal-creature" who was taunting her. "She's threatening to eat me up," Meeka whispered. Above the creature, she then wrote out the words:

> Hi, well come to our house, hooo! It seem she's from Africa. What brings you here. Well everybody is innocent around here. African bitch would you like to have some fun. Why can't you shut the fuck up, I am try to a sleep here. Or you want to help you shut it up? African nigger. I don't know what you're doing in the country in the first place.
>
> Let me tell you, crying and shouting can't help you, you're going to jail, then you'll meet me there. Just have your baby and I can have you. Look at me, am talking to you. Don't you enjoy seeing fun. ah, ah, ah, ah!

As we looked at the drawing together, Meeka spontaneously described, in a quiet and halting manner, her memories of what she had witnessed in one of the holding cells. She said that as she was finishing the "animal-creature," she "suddenly saw" that her cellmates had engaged in explicit sexual acts with each other and had threatened to sexually abuse her. She knew that the only reason that they had not touched her was the fact that she was visibly preg-

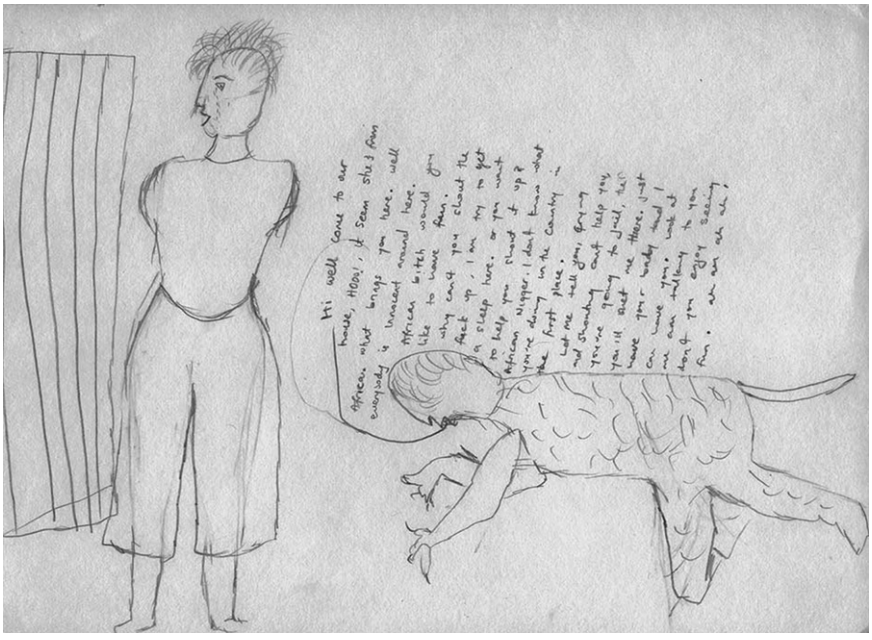


Fig. 6. The fourth drawing: depiction of previously dissociated memories of threats of sexual abuse by cellmates during Meeka's imprisonment.

nant. She had not realized until now that "the tiny little pieces of pictures" that would flash through her mind whenever she thought about, or attempted to engage in, any type of intimacy with Saki, were of these women having sex and threatening her. "I think I was actually making myself black out before I could see how the pieces fit together," she exclaimed. We were then able to discuss Meeka's experience of having been victimized because she was an African immigrant whose skin was darker than that of her cellmates.

Analysis of the fourth drawing and interventions

At this point, Meeka no longer needed the protective distance of the third-person. When I connected her current concern about her marriage to disclosures she had made in the previous session involving her experiences in the jail cells, and offered the possibility of using art to clarify her feelings, she was able to create her first autonomously drawn self-portrait. Once again, a high level of anxiety is depicted, with the Meeka figure's hair literally standing on end. There is a significant distortion of her body image, as she appears impossibly twisted: she said that she was facing away from the scene and her head is indeed turned away, yet her rounded, pregnant abdomen and feet indicate that she is simultaneously facing forward. It is as if she believes that she has been tainted by the sexual activity that was going on around her and is struggling with feelings of guilt for any glimpses of this behavior that her natural curiosity may have led her to take. Flashbacks of the actual threats of her cellmates, as well as of the sights and sounds of sexual activity she was exposed to, would have reinforced that belief. Her arms appear cut-off and wounded, and the cellmate is depicted as animal-like and distorted in her exhibitionistic and aggressive posture on the floor. While this semi-human creature may represent Meeka's simulated embodiment of these aggressive women, the drawing also makes it clear that Meeka and the perpetrator are separate beings. The gestural acts involved in creating an image in which self and other are distinguished may have modulated Meeka's MNS, allowing her to "see how the pieces fit together," and then to articulate her memories explicitly.

Conclusion of treatment

The nodal sessions just presented, which occurred during the first 2.5 months of our work together, provided a strong foundation for the rest of the treatment. To paraphrase Shengold (1981, p. 304), "metaphor led to memory." Having accessed the memories described above within the safe arena of the arts/playspace, Meeka progressed from the frozen state of "being the other" to being able to "be herself." This enabled her to engage in the process of grieving her losses, including those stemming from the predisposing traumatic events in her childhood, and creating a new life.

As Meeka became more comfortable discussing and working through her experiences and feelings with words, she rarely chose to make art during our sessions. She made slow but significant progress in many areas of her life, and within six months she was able to titrate off her medication. Our work focused on the rocky course of stabilizing her relationship with her husband. We also started to explore Meeka's feelings about re-entering her West African community. After about 18 months of treatment, she took a position as a full-time security guard at a shelter for families with children. Her job involved wearing a uniform that she said resembled a police uniform. This unconscious reframing of the defense of identification with the aggressor seemed to serve her well. She began to be able to travel freely and could readily socialize with friends. Over time, she was able to resume her sexual intimacy with her husband, and their relationship once again became a loving and supportive one.

After three years of working together, Meeka and I had our final session. Her only remaining symptom was a startle reaction and intense anxiety whenever an unexpected visitor rang her doorbell. During our protracted termination period, the bulk of our work revolved around helping Meeka prepare for and cope with the traumatic depositions related to her court case. Meeka and her family moved to a new apartment toward the end of treatment, in an effort to put this incident behind them. She also became pregnant with her second child around the same time.

Four years later, a jury awarded Meeka $1,000,000 at the conclusion of a long and grueling trial. She told me that the fact that the jury believed her story meant more to her than any money she would receive. She and her family moved to another state, where she has relatives. One of her attorneys has since reported to me that she had made a good adjustment to the move.

Concluding remarks

The mind and body are inextricably linked. Ramachandran (2000, para. 1) predicted that "mirror neurons will do for psychology what DNA did for biology: they will provide a unifying framework and help explain a host of mental abilities that have hitherto remained mysterious and inaccessible to experiments." Though the biological examination of the efficacy of psychotherapy is in its nascent stage, neuroimaging techniques have already provided incontrovertible evidence that the psychotherapeutic relationship can produce detectable neuronal changes in the patient's brain (see Etkin, Pittenger, Polan, & Kandel, 2005). Preliminary EEG studies (Belkofer & Konopka, 2008; Bhattacharya & Petsche, 2002, 2005) have documented some of the cortical changes that occur when subjects look at, visualize, and create works of art.

In her review of the brain structures and functions involved in sensory information and affective processing, artistic expression, and symbol formation, Lusebrink (2004) emphasized the importance of attending to the complexity of the multiple brain processes that may be activated in an art therapy context. The data regarding the mirror neuron system and embodied simulation provide us with another window through which we can view that complexity. By offering the crossmodal processes of artistic/metaphoric expression as a treatment modality, art therapists harness the fact that human beings have a "body-based understanding of the world" (Gallese & Lakoff, 2005, p. 466). This, in turn, facilitates the patient's access to the implicit realm of experience and memory. In treating the art product as an extension of the patient-as-artist's self, we respect the exquisite sensitivity engendered by embodied simulation in a manner that promotes the patient's capacity to value his or her inner world.

It is not uncommon for art therapy to be described as a "non-verbal" therapy. However, just as psychoanalysts must not be exclusively concerned with the verbal expressions of their patients, the implicit, non-verbal realm of expression is not the sole purview of art therapists. Research on the MNS provides us with a new understanding of the intimate physiological links between embodied simulation, gesture and the spoken word. This can help us refine our interventions so that we can enhance the possibility for the inchoate to be expressed and understood, in whatever form is possible for the patient in a given moment. These discoveries also give us a more nuanced understanding of why our patients typically articulate their memories and feelings after making art in our presence.

Patients who have sustained profound interpersonal trauma are often left in a state of being possessed by their horrendous experiences—the possession taking the form of the debilitating symptoms of PTSD. The survivor's life becomes organized around being forced to remember having been abandoned and betrayed

(the reexperiencing and increased arousal symptoms) while simultaneously trying to forget (the avoidance, numbing and dissociative symptoms). The tension created by these two opposing forces creates a static vacuum in which representation may feel impossible. Perhaps that vacuum can be thought of as the home of the internalized perpetrator, making it an especially dangerous place to visit. Yet the will to survive, to be understood, to connect with others, to make sense of reality, and to heal, all work in consort to enable the survivor to risk entering treatment. When the possibility of making art is facilitated during that treatment, the different languages of the mind can be "spoken," and a concrete place can be found for the traumatic memories to exist without dominating everyday life.

References

Acosta, I. (2001). Rediscovering the dynamic properties inherent in art. *American Journal of Art Therapy*, *39*(3), 93–97.

Beebe, B., Knoblauch, S., Rustin, J., Sorter, D., Jacobs, T., & Pally, R. (2005). *Forms of intersubjectivity in infant research and adult treatment*. New York: Other Press.

Belkofer, C. M., & Konopka, L. M. (2008). Conducting art therapy research using quantitative EEG measures. *Art Therapy*, *25*(2), 56–63.

Bernardis, P., & Gentilucci, M. (2006). Speech and gesture share the same communication system. *Neuropsychologia*, *44*(2), 178–190.

Bhattacharya, J., & Petsche, H. (2002). Shadows of artistry: Cortical synchrony during perception and imagery of visual art. *Cognitive Brain Research*, *13*(2), 179–186.

Bhattacharya, J., & Petsche, H. (2005). Drawing on mind's canvas: Differences in cortical integration patterns between artists and non-artists. *Human Brain Mapping*, *26*(1), 1–14.

Carr, L., Iacoboni, M., Dubeau, M., Mazziotta, J. C., & Lenzi, G. L. (2003). Neural mechanisms of empathy in humans: A relay from neural systems for imitation to limbic areas. *Proceedings of the National Academy of Sciences*, *100*(9), 5497–5502.

Collie, K., Backos, A., Malchiodi, C., & Spiegel, D. (2006). Art therapy for combat-related PTSD: Recommendations for research and practice. *Art Therapy*, *23*(4), 157–164.

Crenshaw, D. (2006). Neuroscience and trauma treatment: Implications for creative arts therapists. In L. Carey (Ed.), *Expressive and creative arts methods for trauma survivors* (pp. 21–38). London: Jessica Kingsley.

Donald, M. (1991). *Origins of the modern mind: Three stages in the evolution of culture and cognition*. Cambridge, MA: Harvard University Press.

Edwards, G. M. (1993). Art therapy with HIV-positive patients: Hardiness, creativity and meaning. *The Arts in Psychotherapy*, *20*(4), 325–333.

Etkin, A., Pittenger, C., Polan, H. J., & Kandel, E. R. (2005). Toward a neurobiology of psychotherapy: Basic science and clinical applications. *Journal of Neuropsychiatry and Clinical Neurosciences*, *17*(2), 145–158.

Fosshage, J. L. (2005). The explicit and implicit domains in psychoanalytic change. *Psychoanalytic Inquiry*, *25*(4), 516–539.

Freedberg, D., & Gallese, V. (2007). Motion, emotion and empathy in esthetic experience. *Trends in Cognitive Sciences*, *11*(5), 197–203.

Freud, S. (1958). The disposition to obsessional neurosis, a contribution to the problem of the choice of neurosis. In J. Strachey (Ed. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 12, pp. 311–326). London: Hogarth Press (original work published 1913).

Freud, S. (1961). The ego and the id. In J. Strachey (Ed. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 19, pp. 1–66). London: Hogarth Press (original work published 1923).

Freud, S. (1963). Introductory lectures on psycho-analysis. In J. Strachey (Ed. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 15–16, pp. 1–496). London: Hogarth Press (original work published 1916–1917).

Frewen, P. A., & Lanius, R. A. (2006). Toward a psychobiology of posttraumatic self-dysregulation: Reexperiencing, hyperarousal, dissociation, and emotional numbing. *Annals of the New York Academy of Sciences*, *1071*, 110–124.

Gallese, V. (2003). The roots of empathy: The shared manifold hypothesis and the neural basis of intersubjectivity. *Psychopathology*, *36 (4)*, 171–180.

Gallese, V. (2004). Intentional attunement: The mirror neuron system and its role in personal relations. *Interdisciplines*. http://interdisciplines.org/mirror/papers/1 Retrieved 03.05.2008.

Gallese, V. (2007a). Before and below 'theory of mind': Embodied simulation and the neural correlates of social cognition. *Philosophical Transactions of the Royal Society B*, *362*, 659–669.

Gallese, V. (2007b). Embodied simulation: From mirror neuron systems to interpersonal relations. *Novartis Foundation Symposium*, *278*, 3–19.

Gallese, V., Eagle, M. N., & Migone, P. (2007). Intentional attunement: Mirror neurons and the neural underpinnings of interpersonal relations. *Journal of the American Psychoanalytic Association*, *55*(1), 131–176.

Gallese, V., Fadiga, L., Fogassi, L., & Rizzolatti, G. (1996). Action recognition in the premotor cortex. *Brain*, *119*(2), 593–609.

Gallese, V., & Lakoff, G. (2005). The brain's concepts: The role of the sensory-motor system in conceptual knowledge. *Cognitive Neuropsychology*, *22*(3–4), 455–479.

Glenberg, A. M., & Kaschak, M. P. (2002). Grounding language in action. *Psychonomic Bulletin & Review*, *9*(3), 558–565.

Golub, D. (1985). Symbolic expression in post-traumatic stress disorder: Vietnam combat veterans in art therapy. *The Arts in Psychotherapy*, *12*(4), 285–296.

Greatrex, T. S. (2002). Projective identification: How does it work? *Neuro-Psychoanalysis*, *4*(1–2), 187–197.

Howard, R. (1990). Art therapy as an isomorphic intervention in the treatment of a client with post-traumatic stress disorder. *The American Journal of Art Therapy*, *28*(3), 79–86.

Iacoboni, M. (2008). *Mirroring people: The new science of how we connect with others*. New York: Farrar, Straus and Giroux.

Iacoboni, M., & Dapretto, M. (2006). The mirror neuron system and the consequences of its dysfunction. *Nature Reviews: Neuroscience*, *7*(12), 942–951.

Johnson, D. R. (1987). The role of the creative arts therapies in the diagnosis and treatment of psychological trauma. *The Arts in Psychotherapy*, *14*(1), 7–13.

Johnson, D. R. (1998). On the therapeutic action of the creative arts therapies: The psychodynamic model. *The Arts in Psychotherapy*, *25*(2), 85–99.

Klorer, P. G. (2005). Expressive therapy with severely maltreated children: Neuroscience contributions. *Art Therapy*, *22*(4), 213–220.

Kohler, E., Keysers, C., Umiltà, M. A., Fogassi, L., Gallese, V., & Rizzolatti, G. (2002). Hearing sounds, understanding actions: Action representation in mirror neurons. *Science*, *297*(5582), 846–848.

Kramer, E. K. (1986). The art therapist's third hand: Reflections on art, art therapy and society at large. *American Journal of Art Therapy*, *24*(3), 71–86.

Laub, D., & Podell, D. (1995). Art and trauma. *International Journal of Psychoanalysis*, *76*(5), 991–1005.

Leclerc, J. (2006). The unconscious as paradox: Impact on the epistemological stance of the art psychotherapist. *The Arts in Psychotherapy*, *33*(2), 130–134.

Loewald, H. (1980). *Papers on psychoanalysis*. New Haven, CT: Yale University Press.

Lusebrink, V. B. (2004). Art therapy and the brain: An attempt to understand the underlying processes of art expression in therapy. *Art Therapy*, *21*(3), 125–135.

McGeoch, P. D., Brang, D., & Ramachandran, V. S. (2007). Apraxia, metaphor and mirror neurons. *Medical Hypotheses*, *69*, 1165–1168.

Meltzoff, A. N. (1990). Towards a developmental cognitive science: The implications of cross-modal matching and imitation for the development of representation and memory in infancy. *Annals of the New York Academy of Sciences*, *608*, 1–37.

Meltzoff, A. N., & Borton, R. W. (1979). Intermodal matching by human neonates. *Nature*, *282*(5737), 403–404.

Meltzoff, A. N., & Brooks, R. (2001). "Like me" as a building block for understanding other minds: Bodily acts, attention, and intention. In B. F. Malle, L. J. Moses, & D. A. Baldwin (Eds.), *Intentions and intentionality: Foundations of social cognition* (pp. 171–191). Cambridge, MA: MIT Press.

Meltzoff, A. N., & Moore, M. K. (1977). Imitation of facial and manual gestures by human neonates. *Science*, *198*(4312), 75–78.

Meltzoff, A. N., & Moore, M. K. (1989). Imitation in newborn infants: Exploring the range of gestures imitated and the underlying mechanisms. *Developmental Psychology*, *25*(6), 954–962.

Oliner, M. M. (1996). External reality: The elusive dimension of psychoanalysis. *Psychoanalytic Inquiry*, *65*(2), 267–300.

Pally, R. (2001). A primary role for nonverbal communication in psychoanalysis. *Psychoanalytic Inquiry*, *21*(1), 71–93.

Pigman, G. W. (1995). Freud and the history of empathy. *The International Journal of Psychoanalysis*, *76*(2), 237–256.

Ramachandran, V. S. (2000). Mirror neurons and imitation learning as the driving force behind "the great leap forward" in human evolution. *Edge*, 69 http://www.edge.org/3rd_culture/ramachandran/ramachandran_index.html Retrieved 01.05.2008.

Ramachandran, V. S. (2006). Mirror neurons and the brain in the vat. *Edge*, 176 http://www.edge.org/documents/archive/edge176.html#rama Retrieved 01.05.2008.

Ramachandran, V. S., & Hubbard, E. M. (2001). Synaesthesia—A window into perception, thought and language. *Journal of Consciousness Studies*, *8*(12), 3–34.

Ramachandran, V. S., & Hubbard, E. M. (2004). What neuroscience can teach us about human nature and the potential for change. In M. Devlin (Ed.), *The internet and the university: Forum 2003*. Cambridge, MA: Forum Publishing, pp. 15–33

Rizzolatti, G., & Arbib, M. A. (1998). Language within our grasp. *Trends in Neurosciences*, *21*(5), 188–194.

Rizzolatti, G., & Craighero, L. (2004). The mirror-neuron system. *Annual Review of Neuroscience*, *27*, 169–192.

Rizzolatti, G., Fadiga, L., Fogassi, L., & Gallese, V. (1997). The space around us. *Science*, *277*, 190–191.

Rizzolatti, G., Fogassi, L., & Gallese, V. (2006, November). Mirrors in the mind. *Scientific American*, 54–61.

Rubin, J. A. (1984). *The art of art therapy*. New York: Brunner/Mazel.

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

Seligman, M. E. P. (1975). *Helplessness: On development, depression and death*. New York: W.H. Freeman and Company.

Shengold, L. (1981). Insight as metaphor. *Psychoanalytic Study of the Child*, *36*, 289–306.

Siegel, D. J. (1999). *The developing mind: How relationships and the brain interact to shape who we are*. New York: Guilford.

Spring, D. (2004). Thirty-year study links neuroscience, specific trauma, PTSD, image conversion, and language translation. *Art Therapy*, *21*(4), 200–209.

Stern, D. (1985). *The interpersonal world of the infant*. New York: Basic Books.

Talwar, S. (2007). Accessing traumatic memory through art making: An art therapy trauma protocol (ATTP). *The Arts in Psychotherapy*, *34*(1), 22–35.

Tripp, T. (2007). A short term therapy approach to processing trauma: Art therapy and bilateral stimulation. *Art Therapy*, *24*(4), 178–183.

Urgesi, C., Moro, V., Candidi, M., & Aglioti, S. M. (2006). Mapping implied body actions in the human motor system. *The Journal of Neuroscience*, *26*(30), 7942–7949.

van der Kolk, B. A. (1988). The trauma spectrum: The interaction of biological and social events in the genesis of the trauma response. *Journal of Traumatic Stress*, *1*(3), 273–290.

van der Kolk, B. A. (2006). Clinical implications of neuroscience research in PTSD. *Annals of the New York Academy of Sciences*, *1071*, 277–293.

van der Kolk, B. A., & Greenberg, M. S. (1987). The psychobiology of the trauma response: Hyperarousal, constriction, and addiction to traumatic reexposure. In B. A. van der Kolk (Ed.), *Psychological trauma* (pp. 63–87). Washington, DC: American Psychiatric Publishing.

Wolf, N. S., Gales, M., Shane, E., & Shane, M. (2000). Mirror neurons, procedural learning, and the positive new experience: A developmental systems self psychology approach. *The Journal of the American Academy of Psychoanalysis & Dynamic Psychiatry*, *28*(3), 409–430.

Wolf, N. S., Gales, M. E., Shane, E., & Shane, M. (2001). The developmental trajectory from amodal perception to empathy and communication: The role of mirror neurons in this process. *Psychoanalytic Inquiry*, *21*(1), 94–112.

Yehuda, R. (Ed.). (2006). Psychobiology of posttraumatic stress disorder: A decade of progress [Special issue]. *Annals of the New York Academy of Sciences*, *1071*.