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A NORTON PROFESSIONAL BOOK

ART THERAPY & THE NEUROSCIENCE OF RELATIONSHIPS, CREATIVITY & RESILIENCY

SKILLS AND PRACTICES

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pens implicitly through the transformation of the imagery and explicitly through titling and discussion. It is likely that this meaningful change happens by inviting positive experiences and integrating them with older, avoidant responses. The pleasures of art making, even in the face of adverse or uncomfortable emotions, can release good-feeling chemicals that increase prefrontal regulation of limbic responses. Furthermore, the brain's natural reward systems can also generate positive responses. Such a shift from negative to positive responses is a shift from a neuroendocrine-mediated feeling of loss of control to a sympathetic nervous system–based feeling of acceptance or being in control. In the future, neuroimaging research may show that as the fearful, right-hemisphere-activated client is encouraged to approach art making, the left hemisphere is engaged to modulate emotional avoidance. The playfulness and pleasure in the art making support the experience of positive left-hemisphere emotions that broaden perceptions and increase the range of action and social options (Fredrickson, 2004). Positive emotions have also been found to facilitate physical well-being and mental health changes. Therapeutically, these have been further associated with self-mastery, pride, gratitude, and love. The two-phase process promotes hemispheric stimulation and integration as a synthesis of intention, attention, and motivation occurs through sensory experiences and motor control. By moving focus from a diffuse state of awareness to more concentrated outward and body-oriented attention, at the same time as one paints or draws, multiple neural circuits are simultaneously stimulated and integrated.

The ATR-N principle of Empathizing and Compassion is activated during the two-phase implicit to explicit art making. The therapist can first demonstrate the different techniques enlisting human imitative capacities, thus supporting clients' confidence that they can do what they have observed. Attempting a technique and then engaging in the exploration of the emotions stimulated by the chance image making allows them to empathically approach their product. Furthermore, the capacity to experience and direct empathy toward others emerges from self-integration and is enhanced by self-empathy. Requiring tolerance and development, this chapter's suggested techniques are rooted in an unforced attempt to have clients accept somewhat difficult or surprising emotions. Not all the challenges and emotions aroused by the art making can be resolved, which promotes empathy. From this perspective, reworking the imagery permits noteworthy internal processes. It allows for a release of the initial image and process, as well as an understanding and sharing of one's feelings in the release of any attachments to habitual ways of coping and relating to the self.

CHAPTER 8

Expressive Communicating: Interpersonal Touch and Space

When working with the clay, one of the main emotions I felt was fear, and my negative memories associated with it, such as my previous failures with clay. The memory of failure and the idea of fear will present itself as a learned response to the stimuli. From that negative, learned response, the stimuli will continue to produce fear in a person when it is presented, as it is for me when I see, and have to work with, clay. The clay is able to move around and it often does what it wants to do, regardless of what the artist asks it to do. The fear I felt about my piece was that it wouldn't mold into what I had pictured in my mind—that it should look like an ending piece. The only way that I felt safe was because I was in a protected space where I could bare my soul, that place being with my group. Over the past few months, I felt safe and comfortable enough to be able to share a piece of myself with my cohorts. Autumn Cade

TOUCH IS A MAJOR SOURCE of sensory stimulation due to the many nerve-ending receptors in our skin. Therefore, the type and origin of touch, as well as the quality of experience, influences our perceptions of and reactions to stimuli. In Chapter 7, vision was the primary means to learning, whereas for this chapter we invite a focus on the experience of touching and manipulating tangible art materials. This chapter illustrates how art-mediated touch informs the CREATE principle of Expressive Communicating. It also highlights how art-mediated interpersonal touch and space (AMITS) may play out in the room between the therapist and the client (Bat Or, 2010; Hass-Cohen & Kim, 2014). As we describe in the last section, these are "third hand," "third eye," and "second mind" experiences that have the potential to transform internal working models (IWMs) of relationships and contribute to earned attachment. Working with materials

like clay serves as a gateway to mental representations of remembered and mentalized touch or emotions, and to the here-and-now experiences of sensory touch. In other words, emotions and memories can be triggered and enhanced by art-mediated touching, and different types of materials evoke different reactions and the associated IWMs. For example, manipulating polymer modeling clay, which can be either smooth or sticky, evokes a different emotion than the experience of earth clay, which clings to hands and fingernails, leaving an earthy odor, which may be reminiscent of playing in the dirt as a child or baking mud-pies with mother. If touching is novel, surprising, or intentional, its processing will involve an amalgam of tactile awareness and emotionality. So the daily experience of touching the fabric of a beloved wool jacket, although comforting, is routine and will therefore not be likely to spark consciousness.

Touch is a fundamental human form of interpersonal communication. The first positive touch sense experienced by an infant, such as maternal stroking and holding, forms early bonding, releases oxytocin, and initiates secure attachment ties. Thus, interpersonal touch provides the most emotional of our sensory experiences, also playing a key role in emotional communication. Even if two people do not know each other, their touching can communicate anger, fear, disgust, love, gratitude, and sympathy as accurately as verbal communication or visual expressions (Hertenstein, Holmes, McCullough, & Keltner, 2009). Interpersonally, touch, or physical contact between people, is a basic psychological need. Touch also releases serotonin, and endorphins, which are good-feeling neurotransmitters (David, 1999). We hypothesize that AMITS may evoke similar bodily sensations and biochemical reactions. In fact, our sense of self and the environment is highly informed by visual and haptic processing of personal and interpersonal information. For example, personal haptic holding of attachment objects, such as a teddy bear or blanket, might include interpersonal memories. Conversely, a mother might keep her son's childhood teddy bear for his own son. Non-directed and directed playful dyadic interactions, which use soft familiar materials, provide opportunities for attachment reparations (Jernberg & Booth, 1999).

Interpersonal haptic touching involves friendly touching as well as the memory and the IWM of touching. Both physical and symbolic interpersonal haptic experiences also inform our sense of interpersonal space. Friendly, romantic, or sexual touching activate regions of the brain responsible for spatial and bodily processing. Mediated by culture, our sense of interpersonal space is survival based (Zur & Nordmarken, 2011). For example, since we cannot see behind us, any unexpected touching from outside our scope of vision may alarm us, causing an impulse to move away or turn around. All touching calls upon brain areas responsible for the spatial and cognitive pro-

cessing of sensory information, including thalamic-limbic regions that connect with the parietal lobe and right frontal areas (Kalat, 2012). Such haptic processing also necessitates insular lobe–mediated bodily sensations, thereby stimulating memories based on environmental, bodily, and psychological experiences. Thus adjunctive therapies such as soft massage may be important and needed interventions that could be included as recommendations.

For some, a persistent lack of touch can be isolating and painful. For others, touch has traumatic connotations, as it can be a reminder of punitive or abusive touch. Hence, sometimes, without knowing, tactile touch can trigger insight into negative interpersonal memories. For example, the wet residue of clay on fingers and clothes may be a reminder of punishment or even abuse by a parental figure, activating an amygdala fear and avoidance response. Conversely, touching and molding the soft, yielding texture of the clay can be a reminder of a positive childhood experience of playing with mud. Smelling the clay's earthiness or sensing its symbolic colors can bring about joy, another amygdala function. With deliberate therapeutic intervention, the fear of touching that can be aroused by tactile media can be cognitively accessed through the higher sensory cortex rather than simply from the amygdala's unconscious reaction. Thus by activating the prefrontal regions of the brain, the amygdala response will be less able to activate (LeDoux, 2003b). Touching the media and verbalizing its effects assist clients in cortical processing of these implicit basic emotions, and unrecognized dimensional feelings. In this chapter, we review this psychoneurobiological interpersonal hub of processing.

Our group members are asked to work with different kinds of clay. We discuss such clay-based objects as mental self-representations of haptic associations and IWM connotations. For our purposes, three types of clay are used: earth-based clay, nondrying oil-based modeling clay (Plastilina), and delicate polymer clay. Earth-based clay evokes strong intrapersonal reactions and transparent group experiences. Here we ask clients to create a Personal Object. Due to the media, these objects are usually large. As they are easily seen by others, their creation facilitates a social environment. Oil-based, easily manipulated, and colorful, the Clay Doodling experiential recruits interpersonal communication by way of making Human Figurines. Here, the use of Plastilina, which is a type of very malleable oil-based clay, aptly connotes interpersonal neurobiology-based changes and plasticity. Finally, polymer clay, Sculpey, may give rise to reflections on reparative touching of fragile connections associated with the frequent fragmentation and burning of this delicate medium during its baking. We facilitate this intrapersonal reparative work by a request for a representation of An Imagined Loved Landscape or Place.

ART-MEDIATED INTERPERSONAL TOUCH AND SPACE

Symbolic and physical AMITS are some of our art therapy field's advantages (Hass-Cohen & Kim, 2014). This is partially because therapist-client touching of any kind is actively discouraged. Such touching presents a high risk to clients with a history of abuse, an aversion to touch, a cultural difference, or a prohibition regarding touching the opposite sex. Positive and safe AMITS include sharing materials and touching one's own artwork or a client's artwork, as well as expressing a positive interest in the tactile aspects of artwork. Several opportunities exist to express closeness, interest, curiosity, and support in this way. In the early stages of a therapeutic relationship, the art therapist may ask or suggest that the client touch a smudged pastel area on the therapist's own page. Alternatively, he or she might ask to touch a client's page to stabilize it as the client's scribbling moves it, or ask to hold a ball of clay made by a client to sense its weight and power. As art therapists show child clients how to wash a brush properly, manipulate the clay, prepare paper strips to make papier-mâché, smooth hands over mono-prints, or wrap precious objects to take home, we ask ourselves about the accidental touch of therapists' and clients' hands. Alternately, the use of dual play with puppets allows for safe touching experiences, as the cloth is a barrier to direct touching. These examples illuminate types of touching, yet, importantly, they also exemplify how AMITS defines the boundaries of interpersonal space.

Symbolically, fingertips brushing another person's fingertips is an example of how the art therapist's "third hand" (Kramer, 1986) can provide reassurance, comfort, and security. In dual drawings, therapists and clients touch the same page as they gesture to each other to co-create. Images of hand representations and their decorations have important therapeutic contributions. For example, a master of interpersonal touching, the late Shirley Riley, used to ask students in her class to draw around one hand and decorate it as a symbol for themselves. They then cut it out and place it with the drawn hands of the other new students, touching or not, to make a mural of connection. She and we use this activity for purposes of a confidentiality statement; it is not unlike a handshake promising to keep each other's information private. More importantly, it creates intimacy, closeness, and assists in positively updating IWM of attachments. The simulation of touch is not limited to touching materials that arouse symbolic mentalization of holding, touching and being touched in a supportive way. Dyadic games, which are common in play therapy, provide another source of here and now touching. Examples are the passing of cotton balls between mother child, holding a large rubber ball between father and child without letting it fall and so on. These are the kind of touches that we ascribe to in a relational setting and

that are congruent with family-based attachment treatment interventions (Hughes, 2004). The process of discussing such group or dyadic art provides opportunities for active mentalizing (Bat-Or, 2010; Gavron, 2013; 2014a; Harel, Kaplan, Avimeir-Patt, & Ben-Aaron, 2006).

Exploring the phenomena of touch led us to create a list of touch types and related art therapy microskills that offer unique reparative opportunities through different types of touching. These include accidental, task-related, and appreciative types of touch. Each conveys a different meaning through haptic experience. Of particular interest to art therapists are active and intentional task-related touches, which are examples of several kinds of interpersonal touches and gestures (Jones, 1994). Positive touches are supportive and appreciative, and are associated with togetherness and affection. On the contrary, negative touches represent control of another, infliction of pain, or anger. Sexual and playful touches can be either positive or negative. Ritualistic touches of acknowledgment, such as welcome or departure greetings and handshakes, are gender and culturally driven. From an ATR-N perspective, the psychobiological foundations for deliberate physical or symbolic touching are interpersonal art therapy haptic skills. Table 8.1 describes each type of touch in general, with modifications specific to art therapy (Jones, 1994).

Our purpose in describing these various types of touch is to heighten our awareness of them as therapeutic tools. It is notable that all touching types can be playful or not and for the most part they can all be neutral, positive, negative, or ambivalent. Together, AMITS form a package of interpersonal microskills. Specifically, we suggest accompanying AMITS with nonverbal gestures and verbal expression, which has the potential to reduce interpersonal misunderstandings. Verbal expression can happen concurrently with AMITS or can follow up. Sensorimotor psychotherapy (Ogden et al., 2006) is a form of therapy that actively focuses on nonverbal gestures, specifically on incomplete sensorimotor actions associated with trauma. The practices of this approach teach clients to self-regulate by mindfully contacting, tracking, and articulating sensorimotor processes. Among other techniques, the art therapist pays attention to gestures that the client has difficulties completing, or ones he or she may avoid because they are associated with the experience of emotional pain (Sholt & Gavron, 2006). Oftentimes art making will evoke those gestures.

As we have discussed, interpersonal touch is a core human need that is mediated by visual, verbal, and emotional memory (Konijn & Van Vugt, 2008). The meaning of touch is wide-ranging. Mediated by our skin, which is our largest bodily organ, tactile touch is a sensory perceptual mechanism that transfers afferent, incoming, external stimuli for the brain to process (Kalat, 2012). The phenomenon of interpersonal touch is an amalgam that

Table 8.1 A Range of Touching Types

Types of Interpersonal-Social Touch	Description/Micro-Skills	
	General	**Art therapy**
Reference to features and appearance	Touching and talking that point out a body part or artifact that the person might be wearing; the person notices a friend's haircut, sweater, jewelry, and/or other personal effects and says something like: "this is pretty, soft, and silky"	Reference to the art or media qualities by client or therapist that can be accomplished by a combination of pointing, touching and talking; can also be positive or negative reference to the self of client
Task and instrumental	Touch that accomplishes a task in itself; the meaning is clear from the touch itself, but secondary positive meaning may be implied; assisting a person in putting on a coat; placing a hand on a person's forehead to check for fever (implies support)	Assisting a client in achieving his or her intentions; positive if the therapist does not overpower with his or her intent (e.g., helping support clay objects in process or holding paper while the client engages in art making)
Accidental and incidental	Touching that occurs as an unnecessary part of the accomplishment of a task; mainly hand-to-hand contacts; here, touch can accomplish a secondary message of interest or friendliness; most common is handing an object to someone and allowing hand-to-hand contact (e.g., a clerk returning change)	Most common is handing an object to someone and allowing hand to-hand contact; most safe when working with children; can be negatively experienced by client, if accidentally happens, needs to be acknowledged; symbolically touching the same paper as the client, helping to stabilize the artwork such as in taping it down, can be experienced as very supportive
Directive or controlling	Attempts to direct behavior, aim for compliance, direct or request mental or perceptual attention; may be experienced as supportive or coercive and controlling even if subtle or well intentioned; often dictated by culture; may or may not require a response	Examples include therapist touching the page and turning it vertically or horizontally, touching a brush or paint, indicating a preference for color through gesture and so on; verbal directives fall into this category as in art therapy all directives invite touch; directive touch differs from instrumental touch as it is broader and may or may not stem from clients' self goals; however the differences between the two are subtle

Adapted from Jones (1994).

includes actual physical or social touch intertwined with the mental representation of repeated patterns of somatosensory firing. Throughout our growth and development, body-based touch experiences become laced with emotional and cognitive memories, as touch is social and anchored in the needs of our species (Gallace & Spence, 2010). Interpersonal touch occurs in a relational context. Therefore, it is plausible that the memories of interpersonal encounters embedded in here-and-now tactile touch give rise to (a) unconscious reactions, such as fear, joy, disgust, or anger; and (b) cognitive awareness of loss, longing, anticipation, pleasure, and specific memories. These touch-based memories will also determine how we handle interpersonal space. Handling and making objects accesses mental and symbolic representations in these memory systems. Over a lifetime, this circuitry is connected to the individual's relational experiences, emotions, feelings, and cognitions.

AMITS and verbal expression assist individuals in constructing a coherent sense of past and present. Experiencing therapeutic symbolic touch via art media can strengthen new neural pathways. Furthermore, examining cortical processing of sensory touch seems to provide insight into the meaning and social construction of interpersonal touch (Murray & Wallace, 2011). The interface between emotions and cognitions, which involves structures within the limbic system and the neocortex, is central to understanding how social touching leads to awareness of fear of touch versus celebration of social closeness.

EXPERIENTIAL PRACTICES AND DIRECTIVES

Experience I: Earthy Clay

> *The earth is in my hands. It is soft and cold to the touch. Memories of childhood reenter my mind as I squeeze and allow it to gush through the tiny openings between my fingers. It reminds me of my first discovery, or taste for that matter, of earth. It reminds me of sandcastles and "sandwiches" on Muizenberg beach, of mud pies and dams at the end of the driveway, of the quest for gold beneath the soil of my feet. What the earth does for me is ground me and remind me of my roots. I am free to be with the earth again. It's quite enlivening. I spend my time playing with the clay. I have no intended shape or form for it, since I know that the clay will ultimately form itself. I close my eyes, still "warming" the clay for myself, and allow a form to transpire, for my art to unfold.* Janine Stuppel

The size of the objects mediates the kind of interpersonal space and touching that occurs. Larger clay forms are transparent as everyone can view them, whereas the artist can choose whether and when to share the smaller polymer clay objects that can be hidden in the palm of the hand. However, the decision to share small objects can create a heightened state of intimacy. This is because personal space becomes interpersonal. To begin the work with clay we therefore invite our group members to: "Use three different clays to make three personal art pieces in small, medium, and large sizes." The invitation to play with size structures aligns well with the types of media offered. For example, the earthy clay lends itself to larger organic forms, whereas the delicate polymer clay is better suited for smaller, more detailed forms. Variation in size provides an intimacy of scale that defines the interpersonal space. People will peer at the tiny objects held on the palms of their peers or even ask to hold a creator's art piece. As objects are revealed, there are many references to the art features and excited verbal exchanges. Symbolic interpersonal touch enhances the tangible experience of working with the three clays. Notably, studio artists report that working with various clay types on the same day heightens awareness of their personal reactions to its properties and their interpersonal interactions.

To facilitate this process, we also organize the shared creative space into three centers. One center has large lumps of gray and terracotta earthy water-based clay, wooden boards, and newspaper. At the next center, trays hold colorful oil-based modeling clay, paper plates, cardboard flats, and utensils. Some trays contain bright, medium-sized square chunks of new and still-wrapped clay, while others hold lumps of reused clay with bled colors. At the third center, polymer fine-grained clay is found in small squares. Plastic-based, it lends itself to the manipulation of fine details. Found three-dimensional objects can be incorporated into any of the clay selections. Just as in the original setup of the art therapist's media table, the presentation of the clay material on center-based tables elicits subtle but important meanings. Whether the oil-based clay or polymer clay is wrapped or unwrapped, has mixed up colors, or has pristine candy-like appeal, the material offers a level of symbolic meta-communication that touches our IWMs. For example, wrapped clay may send the message that its use requires permission to touch. If the clay seems virgin and new it can bring about excitement, fear of failure, or feelings of unworthiness. Used media can, in contrast, connate social sharing or disgust at touching media that have been touched by others. Thus the medium offers a vehicle for inquiry, flexible reflection, and self-expression and also opens a gateway to interpersonal tangible and symbolic touch. We appreciate the center arrangement for underscoring the relational underpinning of our studio art therapy approach. As in group art therapy, working

with the same media, sharing water and utensils, offering support, and providing encouragement enhance relational interactions, and mentalizing thus shaping the interpersonal space.

Occasionally, we set the stage for this AMITS work by asking our milieu's participants to bring in a personal inspiring and meaningful handheld object or symbol. Some suggested items to make are handheld objects, a hand or other body part, and a personal or universal symbol, such as a power animal, which they can then replicate and modify. Maribel selected the clay in order to make a clay nest for a precious stone egg that she brought from home (Figure 8.1).

> *I chose to create around my found object, [and] I immediately felt a sense of joy and calmness. . . . Immediately I recalled the many times in the past when it was just me and the clay, at times not knowing what would emerge from the clump of clay, and at times going into it with clear intentions. I enjoy watching the forms evolve in front of me and at times losing control and welcoming a wonderful accident. As I worked, I looked to my hippocampus for my stored knowledge of the techniques useful for working with the medium. I relied on my thalamus and basal ganglia to guide my movement. A few moments of slight anxiety were provided, courtesy of my amygdala, when I thought my piece would collapse, but soon the same structure, after further processing, provided me with a renewed calmness. I successfully completed the new home for my found object, which is a safe nest for my precious egg.* Maribel Sandoval

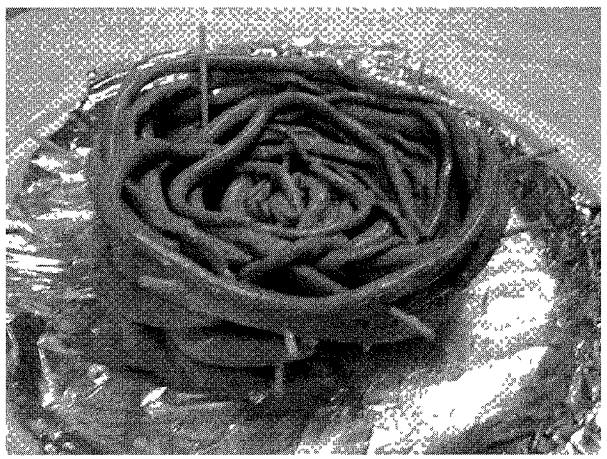


Figure 8.1 *Safety.* Maribel Sandoval

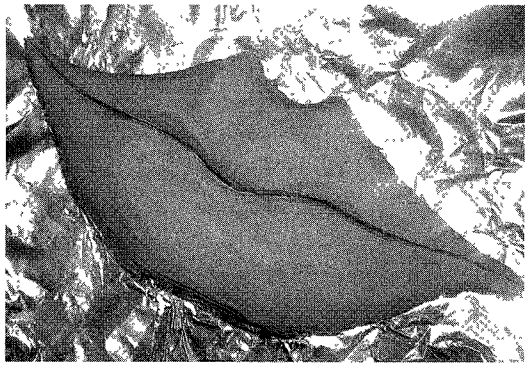


Figure 8.2 *Mysterious Expression* The smile is somewhat mysterious, like the Mona Lisa smile. The mouth is not open to a full smile and the lips are pursed together. I wonder what emotion is behind this expression? Rachel Tate

In contrast, Rachel opted to present a mouth. It is curious that the experience of touching the clay brought forward an image of a part of us that is so central to sensory experiences. As discussed in the upcoming neuroscience section, the neurobiological representation of the mouth is one of the larger regions in the sensory strip. It is as if touching intuitively mediated this for Rachel. In her writing, she connects her sculpting with pleasurable feelings (Figure 8.2).

> *I first began working at the earth clay table. Grabbing a handful of clay, I sat down at my space and began to knead the clay together with my hands. The cold, textured clay was messy, but fun to play with. My hands were masked in the mud-like clay and as the clay dried on my hands, it turned into crumbles that became flaky. The mud-like smell of the clay brought back pleasant memories of ceramics art class when I was younger. After molding the clay in my hands for a while, I decided to make an anatomical body part—a mouth. I had been reading the beautiful Carter book and remembered an illustration of a mouth as part of a chapter on the correlation of emotion and expression in the brain. I formed the lips into a smile.* Rachel Tate

Clay inherently pulls us into a broad sensory experience that involves movement, muscles, sensation, touch, sight, and smell. Most people will likely prefer to work with the earth clay by standing up, pressing down the rather large lumps with deliberate touch. Wet clay inherently allows contact with greater weight and mass and a cooler temperature. The initial act of helping oneself to a chunk of clay involves peeling back the plastic sleeve around the block of clay and slicing a slab of it with the wire cutter. For some, this tugging bodily movement is dynamic and invigorating, while for others, it can be intimidating. Tactile touch incorporates pressure, temperature, pleasure, pain, joint position, muscle sense, and movement. Sometimes, we ask artists to shut off visual processing by closing their eyes. This facilitates experiencing the primacy of our sense of touch and the challenges in defining what is involved in touching.

At the earthy clay table, group members discuss the experience of touching, kneading, and forming the wet clay. This organic substance provides a very powerful means of eliciting and modulating intrapersonal basic emotions, primarily pleasure or disgust. Some of the artists report that they are very much attracted to the earthy clay, whereas others would rather not touch it. Clay artists share that the medium has two qualities that inherently contribute to this reaction. The first is the grainy, cool, and moist quality of the clay that quite quickly dries on the hands, which can irritate the skin or soothe it. The same is true of its unique smell. Second, the problem that earthy clay poses is that it requires a strong intuition of its qualities in order to create a sturdy form. It can be slippery and unwieldy, and large forms are prone to collapsing. These organic qualities contribute to visual and emotional ambiguity that may trigger a fear response initiated by the amygdala. Indeed, most art therapy perspectives postulate that the unstructured nature of clay may evoke a felt sense of lack of safety and control (Malchiodi, 1998a). The triggering of an alarm response depends on each artist's personal history and familiarity with the media. However, we hypothesize that when experience with the clay is increased, the fear center response is altered into joy; the amygdala fear area is deactivated, and the areas responsible for coping and joy are activated and connected to the trigger.

From an ATR-N perspective, no single or specific medium provokes the same reactions of safety, control, fear, or pleasure for every individual. Rather each person's reaction is triggered by familiarity with the media and by personal and interpersonal memories. Some of our artists report that they find the contact with wet clay pleasurable and novel, as well as stress relieving through the processes of rolling and kneading. Others say that it is not malleable, controllable, or clean—meaning it is messy, dirty, hard to manipulate, and difficult to control. They disclosed that it triggers reminders of times when they felt they lacked control over their environment, sparking a discomfort in touching the clay. Perhaps it was the "yucky" cool, wet clay that dried on their hands, or the "gooey" oil-based clay that stained their fingers. These sensations may have funneled hopeless feelings at the gap between what they perceived as childlike productions and their creative goals. Others might be reminded of times when they were chastised for getting dirty. In contrast, many are delighted at the discovery of the minute fine motor skills required when working in plastic clay and the physical pleasure inherent in rolling, squeezing, and handling large masses of clay. Issues around actual and

perceived control are commonly discussed. Many artists comment on the need to surrender to the clay's fluidity, even if it means ending up with a mud pie for a sculpture. This process may resonate with one's IWM and life experiences. Soothing touching of the watery mess can support accepting this process and with therapeutic support, the process can start to feel good and be therapeutic. As this surrendering experience is supported and accepted, it provides stress reduction and relief, updating of IWMs and valuable opportunities for a diversity of ATR-N interactions.

Experience II: Oil-Based Colorful Clay

Playing with colorful clay has the potential to stir childhood memories as well as invite pleasurable feelings and positive bonding with others. We ask the group members to start by doodling with the colorful Plastilina. Soft, malleable, and never hardening, this type of oil-based medium promotes handling. Little preparation is needed to roll, squeeze, or play with it. Spirals, snakes, balls, or stacks of globes that may resemble a pile or a snowman quickly emerge. All the forms are rounded and organic, and the clay's immediacy requires less attention, leaving room for socializing. Thus, the invitation to let their fingers lead and the ability to rapidly produce artwork relaxes the group members and supports group cohesion and bonding. As in a knitting group, people's fingers mimic each other's hand movements, mirroring mutual fine motor movement. Often there is a type of contagion as one person begins to roll the clay with her fingers and others pick up the motion. In addition, rolling the clay often results in squiggly tubes and coils. Perhaps the childlike nature of the gesture supports the emergence of such spirals and snakes, butterflies and abstract doodles. There is very little pressure to perform when doodling with the oil-based clay. For some who may have had disrupted childhoods, or may not like to play, observing the group members may bring forward a sense of loss or longing for playfulness. Moreover, such pleasurable bodily interactions are associated with the release of oxytocin and reward circuitry chemicals.

> *I usually get really irritated if I see someone copy what I am making, but when we were playing with the plastilina, I thought it was inspiring and comforting how we all ended up making similar shapes. It felt uniquely human; it also reminded me of carefree playful times as a child and adult.* Olivia Stern

Oil-based clay tends to get softer as it is handled and does not have much structure. Therefore, working with this type of clay can also bring up issues of

control. Negative reactions to the polymer clays are usually more on the neutral side and focus on frustration with the lack of ability to bring sharp definitions to the clay forms. Cut-up plastic stirrers or wooden toothpicks can provide structure, similar to armatures.

As experimentation progresses, some of the doodles will naturally turn into small figures, and everyone is asked to: "Create small figurines." As these figures emerge, the chatter often quiets and groupings of human figurines begin to cluster. We then ask participants to: "Position the figures in relation to each other: sitting, standing, and touching." Role-playing with the figures may ensue, quickly moving into the interpersonal realm. This is in part because one can construct such figures so rapidly out of the oil-based clay. It is also quite easy to change the appearance of the figurines, have them hold hands, and interchange figures with one another. Similar to play therapy, this work provides an opportunity for therapeutic projections, mentalizing and reflections (Bat-Or, 2010; Sholt & Gavron, 2006). Changing the figurine's features and adding decorative personal touches, such as a baseball cap turned backward or buttons, alters and makes the figurines personal. As such an idiosyncratic personal body schema develops, it is possible that the insula, the fifth lobe that connects the mind to the body and is implicated in touch, may be stimulated. Our sculptors report that they try to figure out how a body works in order to make their figure stand up or sit. The process stimulates connecting with one's own body in order to find such solutions (Figure 8.3).

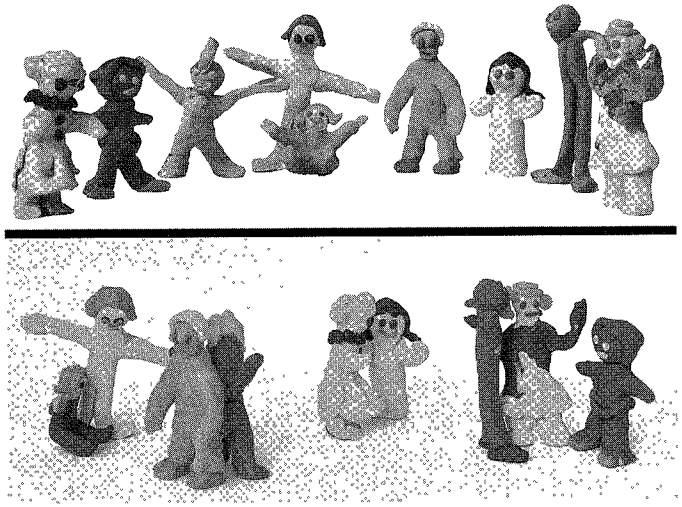


Figure 8.3 *Group configurations. Parade of Figurines* (left) and *Relational Pairings* (right).

As I played with the clay, I thought to myself that I could represent myself in this figurine group. I added a yellow cap to my red figure. For me, it represented my ginger hair, which as an adolescent I had tried to cover up. Now red is my favorite color. I identify with its symbolic qualities. Much to my delight, the group at the table immediately picked this up, asking if the figure was me. It felt supportive. They did not know about my past, but they sure see me in the present. Olivia Stern

It is inevitable that as the figurine groups emerge, made-up families, groups, or couples emerge; touching, holding, or reaching out to each other. In small clusters, each participant first places his or her figurines in families or groups. Accordingly, relationships can be described suggesting closeness or tension. Our late colleague, Shirley, elegantly employed AMITS by using simple clay figures to explore and demonstrate relational dynamics. Her students always experimented with repositioning figurines they had made in order to achieve a felt sense of family dynamics. This directive is also reminiscent of Virginia Satir's (1988) family sculpting. She used the live family sculptures to evoke emotion and connectivity. Ahead of her time, she recognized how emotions and positivity can promote systemic changes. Influenced by Satir's interventions, group members request each other's permission to touch, move, or change the posture of their figurines. For example, Olivia adjusted Mary's figurine arms so that they could embrace each other. Exploring Satir's model in the small groups and how it translated into clay work in the studio promotes a deep understanding of mentalizing systemic art therapy approaches.

We then suggest a final theme to: "Make a real or imagined place that you love with the oil-based clay," which we attribute to Rachel. In Rachel's case, she did not include human figurines (Figure 8.4).

The next table I went to was the Plastilina table. There were many bright colors to choose from, and I first chose a light blue color. As I pulled away a handful of the modeling clay, I could immediately tell the difference between the earth clay and this plastilina. This clay was smooth, but hard, felt a little sticky, and left an oily residue on my hands. I thought about my handheld object—the little tree that I had bought during my trip to Brazil. The memories of being in the rainforest and seeing the amazing Iguazu Falls came back to me and I decided to create a personal object; to re-create a waterfall after the memories invoked by my handheld object. I started with red and brown clay, resembling the earthlike, rocky base of the falls and the back wall of the falls. I used popsicle sticks as a support to prop up the brown clay for the background of the waterfall. Then, taking a handful of bright blue clay and with the light blue clay, I rolled the clay into thin pieces of varying lengths and attached them to the top of the base and wall. The layers of blue clays were molded to represent the downward movement and force of the huge amounts of water gushing from the falls that coalesce into a pool of water below. Rachel Tate

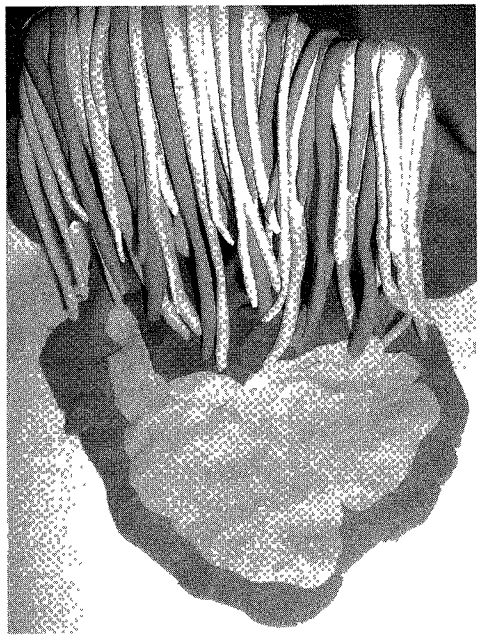


Figure 8.4 *Waterfall.* A personal object reflecting a pleasant memory of a trip to Iguazu Falls, Brazil. The bright blue colors and the malleability of modeling clay enabled me to capture downward movement of the falls. Rachel Tate

Tactile touch of objects and body can be presented as a chain of associative images or can form one cognitive visual amalgam, as illustrated by Rachel's waterfall. The qualities of this oily clay lend themselves to the representation of memory-based touch, such as Rachel's experience of the gushing waterfall and deep pool. Attempts to accurately represent one's memories will frequently stimulate a squashing, smearing, and blending of colors. Then longing for soothing, comforting touch can be represented via imagined warm beachscapes. In this way, the real-time pleasure of touching the easily moved clay, combined with the imagined well-being in a loved environment, results in an experience of safe, supportive touch. Transitioning from a Personal Object and Clay Doodling, to a Human Figurine, to a representation of an Imagined Loved Place allows the creative artists presents IWM that are mediated by AMITS. The kinds of touches that this work inspires run the

gamut of the types of touches possible. Task-related touching as well as accidental or form-controlling touch happens as the group members help each other. Moreover, referencing and discussing the art further expands opportunities for interpersonal touch.

Experience III: Polymer Clays

Similar to talismans, handheld and symbolically felt, Personal Objects have multiple therapeutic uses. They serve in this capacity as reminders of safe experiences, connections to nature, and souvenirs from people and places. Many group members will disclose that they have collections of such objects stored in boxes, or displayed as part of small personal altars. We ask group members to use the delicate polymer clay in order to: "Create a personally meaningful object." Some examples are gritty beach shells, little pieces of soft driftwood from dry riverbeds in summer, or wind-polished granite pebbles from a desert. As described earlier, Maribel's object was a precious egg. She had originally made a safe clay nest for it and then transitioned to describing how she made delicate clay feathers for the nest's lining. The floating green-and-white leaves, and the small heart she named Comfort, convey the tactile pleasure experienced from pressing, squishing, bending, and fine-tuning polymer clay into a representation of the egg, nest, and feathers. They are also mental representations of safety and self-care generated during the artist's manipulation of clay (Figure 8.5).

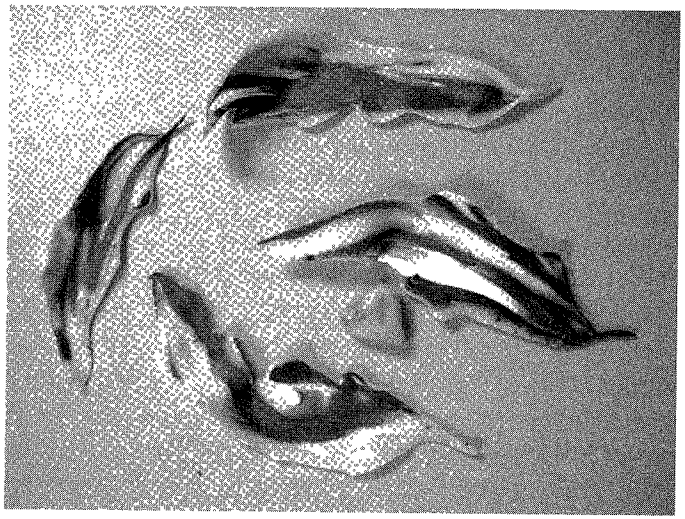


Figure 8.5 *Comfort.* Maribel Sandoval

> *Using Sculpey I decided to continue with my theme of home and safety for my precious egg. I thought about the colors that would evoke feelings of safety, warmth, and comfort. I chose a light fleshy pink. I rolled it out and then introduced strands of a soothing green into it and meshed them together. Light white clay, which resembled moonlight to me, caught my eye, and with the feelings of serenity that I feel when I recall the moonlight, I immediately reached for it and incorporated it into my work. I associate light as a symbol of safety, guidance, and hope. After some time of rolling the Sculpey into one, I then began to tear it apart to create feathers. I plan to line the nest with them.* Maribel Sandoval

The polymer-based clay can hold a form, and it allows finer control in smaller dimensions. However, although polymer clay can easily be baked and hardened to a permanent form, it is fragile and risks burning and loss of fine details. Studio participants can feel the sting of disappointment when a figure cracks or breaks upon baking, or when frustration besets an ambitious goal.

> *My friend had turned the oven up too high and burned her little clay scorpion, and when it finally came out of the oven, two of the delicate legs had broken off. Our studio facilitator took on the role of the therapist and embodied a third hand in guiding and assisting her through the process of fixing her object without influencing her process. Paint was added to the image and the burned section of the clay became an intentional color black. Then, the legs were carefully attached with tacky glue. Together, they discussed what this experience meant for her. She said that this experience gave her scorpion a quality of being able to sustain and survive [being burned in the oven]. I found this very empowering.* Jessica Plotin

Within an interpersonal safe space, the therapist's or peer's "third hand" can offer technical support, comfort, and a mutual experience. As the work progresses, the artists continue to discover the significance of this interpersonal "hand." Therapeutically, the role of the therapist as a third hand (Allen, 1995; Kramer, 1986) is expanded into the realm of the social-interpersonal milieu. As group members respond to the demands of drying or baking their polymer pieces, which require shoring up and support, they also witness and experience the soothing assistance modeled by a friend or the studio facilitator. An example involves the artist or support person wrapping the earth clay so that it dries slowly. Treating the drying processes with loving attention by carefully wrapping the clay with layers of wet cloth and plastic provides

opportunities for supportive touching. Making space for the clay sculpture on the drying shelf and taking care that it does not touch neighboring projects is symbolic of a secure interpersonal space. The artist and the studio facilitator revisit this space after one week. As they check the progress of the project by carefully touching and looking at the sculpture, they are reminded of the time when it was made and of its meaning. As a group, we witness how patching, securing, and supporting three-dimensional art making products become interpersonal exchanges.

Sometimes group members will ask for others' help, asking, for example, "Can you please hold this part here while I tuck in some supports underneath it?" Others will offer help and support in the form of aluminum foil or similar props that hold the object while it dries, or that will lighten top-heavy parts. Alternatively, some may prefer that their work remain untouched. Thus, during this process each group member may behold, comment upon, and touch others' art, resulting in interpersonal closeness and a united small-group experience. In other words, we actively advocate for looking at and experiencing technical strategies as interpersonal supports. These interpersonal strategies run the full gamut of generating ideas, working on the project, and finishing it. For example, the process of making Olivia's dragon required flexibly adjusting to the clay's properties. Such challenges allowed for exchanges around making the dragon safe and comfortable, which are also conversations about art-mediated intrapersonal safety, attachment based IWM and tactile touch (Figure 8.6).

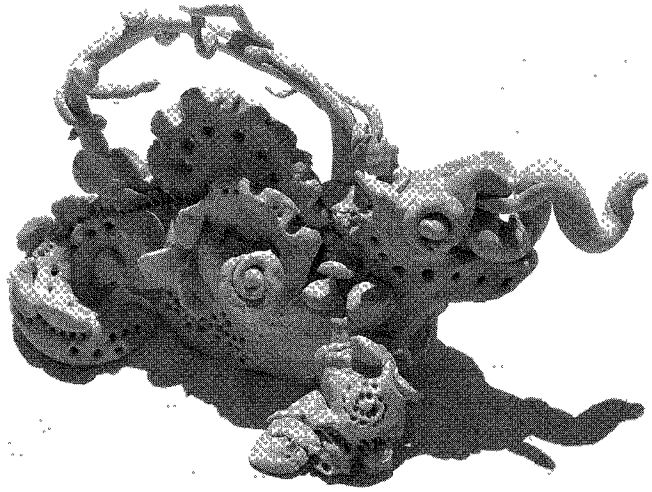


Figure 8.6 *The Fierce and Loving Dragon.*

> *I decided to make a dragon. I have always considered it my power animal. I love the shape of the fire-breathing hoarding European dragon and imbue it with the Chinese dragon's good luck. Originally, I had thought to make this wonderful fire-fighting dragon with its wings wide spread, about to take off. As pieces of my intricate wings started to break from the main body of the dragon, my friend said, "Why don't you use strands of clay to make your dragon fire?" Slowly, the image transformed to this decorative dragon, which I strongly identify with.* Olivia Stern

Maribel's final comments mention the group as she reflects on the process:

> *In the end it was agreed that during our art experiential our emotions were heightened as we visually enjoyed the colors, took in the scents of the clay, and experienced the feel of the clay on our hands.*

Overall, the clay experiences allow the studio participants to foresee therapeutic choices that enable different levels of perceived control and interpersonal touch. They also report on an increased sense of safety and empowerment. One contributing factor is that the art assists in organizing the interpersonal space and reducing unpredicted spatial movements in the room. The artists expect that those working at the earth clay center will move around, handling the large accessories such large lumps of clay, wooden boards, and water pails; this anticipation and acceptance contributes to an internal sense of safety. More importantly, we all anticipate that group members will wander around the room looking, touching, and talking about the media and the art. The emergence and completion of sculptures trigger curiosity, movement, socializing, and thus interpersonal space.

> *I knew that they were coming to see my dragon so I was not particularly startled by their accidental touching of me or the bits of clay lying around him. I was happy that no one touched him but was not startled by them coming really close by to me. In fact, I was flattered and it made me feel good. It freed me to go and visit other people's sculptures. Some asked me to feel how hard the edges of their baked clay had become. That was surprising. I learned much about myself and others through touch.* Olivia Stern

RELATIONAL NEUROSCIENCE: INTERPERSONAL TOUCH

Humans and other mammals seem to have a great need for touch. Harlow's (1958) research demonstrated that baby monkeys sought comfort from a

terry cloth mother even when it did not provide food (Harlow & Zimmerman, 1959). Interpersonal touch is a complex psychological phenomenon with beginnings early on in life. Orphans raised in substandard institutions with minimal caregiving and touch may experience difficulties in cognitive, social, and neural development (Kravits, 2008b). Conversely, stable intensive care that includes touch for preterm infants has been associated with increased weight gain, improved developmental outcomes, and reduced duration and number of hospital visits (Field, 2004). In fact, skin-to-skin touching between mother and newborn was found to reduce cortisol measures of stress in babies and improved breast-feeding outcomes (Field, 2004). Based in animal research, touch continues to emerge as an important sensory modality that facilitates growth and development in the young (Ardiel & Rankin, 2010).

In the previously provided neurobiological overview (Chapter 2), as well as in other chapters, we introduced most of the critical structures, brain areas, and functions. Here, we expand and build upon that schematic information and further examine how subcortical and cortical circuitry work together (Christian, 2008). This is particularly relevant to the study of fear and interpersonal touch and space. In the upcoming sections, we discuss some aspects of the neurobiological interface between fear, control, and interpersonal touch. In a nutshell, it is plausible that the meaningful manipulation of clay, which involves emotive expression, is influenced by the brain's fear center, the amygdala. Clay work also involves controlled voluntary movement, a function of the motor system that increases cognitive functions. Cognitive awareness and emotional expression are further heightened by integrated functions of the somatosensory strip, thalamus, parietal lobe, insula, and other prefrontal regions. From an art therapy perspective, the formation of imagery, which involves kinesthetic and sensory manipulation, directly shapes memory over the life span (Lusebrink, 2014).

The Amygdala

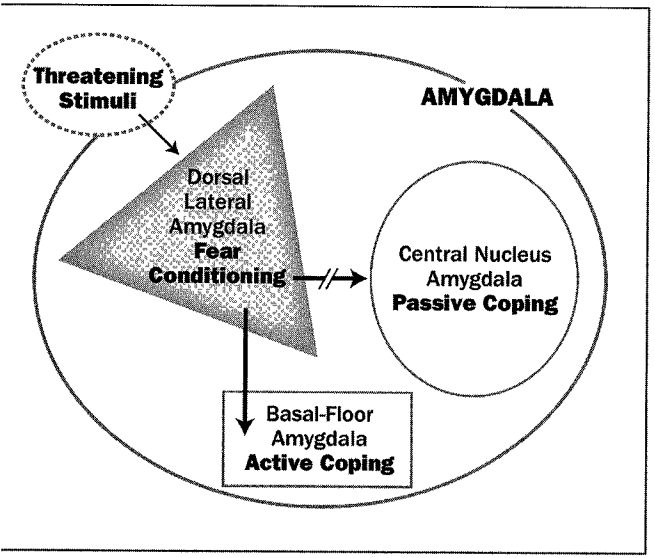
Neuroscience research suggests that emotions and cognitions are not isolated from each other. Both Damasio (2005) and LeDoux (2002) have shown that amygdala-based emotions involve neural processes that crisscross limbic, cortical, and lower brain regions. Findings from case studies of people with damage in the prefrontal cortex suggested that emotional and cognitive processing are interlinked (Damasio, 2005). Brain damage in cognitive processing areas is linked to expected cognitive dysfunction, yet emotion and personality are also heavily affected. Conversely, in cases of damage to the amygdala (AMY), cognitive functioning can also become diminished or compromised because of this impaired emotional function (Phelps & LeDoux, 2005). It is also

likely that how people react is culturally and language driven. For example, in Pali, which was the language used by the Budhha, there is no separate word for *cognition* and *emotion*, and for *brain* and *heart*. Our Westernized culture and language may account for some of the mind-body dichotomies that we experience. As described above, neuroscience research continues to suggest that these dichotomies may not be valid.

Similarly, the AMY, which receives messages from the senses is sensitive to experiences of both fear and joy (Koelsch et al., 2013). Thus, tactile stimuli associated with particular pleasant or unpleasant memories can trigger AMY responses. Due to the AMY connections to the hippocampus, the memory center, memories triggered by touching can activate the AMY. The touching of media is processed by the thalamus with inputs to both the AMY and reward circuitry. These inputs contribute to an evaluation of the stimuli as either dangerous or safe and pleasurable. Tactile sensations and emotional memories are often bi-directionally associated (Vance & Wahlin, 2008).

While benign signals are first sent to the neocortex, the AMY receives fear-arousing visual signals before they are processed by the neocortex (LeDoux, 2002). The same is true for ambiguous tactile signals and for amalgams of visual, tactile, and verbal stimuli, which are difficult to label as safe or unsafe. In fact, the AMY houses memories of such stimuli. Therefore, at times, a person is likely to feel and then act, before the neocortex has had time to process the information. Generally, circuitry conveying fear responses (LeDoux, 2002) departs from the AMY on two possible pathways. One is a lower path that goes down into the body, and the other is a higher path that engages cortical and reasoning areas. When acting on thalamic sensory-based messages interpreted as threatening, the AMY immediately sends messages along the low road to alert the body. It also sends and receives messages from the sensory cortex that confirm or negate the fear response via the high road (Kravits, 2008a). However, the lower pathways associated with subcortical structures and autonomic functions react quicker than the high-road recipients do. As multiple bodily and neural sensors respond to touch via pressure, temperature, pain, joint position, muscle sense, and movement, they forward information to the thalamic-amygdala projections, resulting in such immediate automatic reactions (Kalat, 2012). For example, a person will most likely dart away from ambiguous stimuli or avoid a vague sensory trauma reminder, such as the sticky feel of clay. It is only when the high-road cortical response conveys that the stickiness is only a texture that the stimuli ceases to cause unease. In fact, sometimes the AMY fear response is so urgent, that the neocortex is not involved until after danger has passed. This is one of the reasons touching clients with a history of sexual abuse is contraindicated. Their cortical higher-pathway responses are weakened (Hass-Cohen et al., 2014).

general areas of the AMY are involved in fear response: the top, two
ne center, and a bottom area. When a fear stimulus activates the top
dorsal lateral region (D-LA), it stimulates the central nucleus (CeN)
MY and/or the bed nucleus of the stria terminalis (BNST), consid-
of the extended AMY. The CeN or the BNST activates the hypo-
to bring on the fight, flight, or freeze response. This deactivates the
rea, which is associated with coping (LeDoux, 2003a; Panzer, Vil
Loos, 2007). A fear response often results from a conditioned stimu-
ıse (CSR). A CSR occurs when one associates neutral stimuli, like
ay, with an evocative stimulus, like a childhood memory of being
or getting one's hands dirty. For example, in rat studies in which a
s paired with an electrical shock, the same sound eventually elicited
sponse in the rats even when presented without the electrical shock
1996). This kind of fear-based response triggers the top, D-LA,
exquisitely sensitive to conditioned fear-based stimuli. Fear-based
further sensitize connections between the D-LA and the CeN,
bias toward passive coping (Figure 8.7). Over time, this D-LA fear
R inhibits active basal-coping responses. However, if, over a period,
r for the CSR is repeated without the shock, the conditioned



Three Areas of Amygdala Function. The dorsolateral amygdala (D-LA) and the central
) or the bed nucleus of the stria terminalis (BNST) can become conditioned to fearful
oting stimuli, causing a conditioned stimulus response, which weakens connections
al AMY involved in active coping responses (updated from Ledoux, 2003a; Panzer et al

response may be subsequently extinguished and the AMY's ability to produce the fear response decreases (LeDoux, 1996). The AMY connects to the medial prefrontal cortex (mPFC) which can dampen the emotive reaction. Its superficial region has been also associated with activation by social stimuli (Baeken et al., 2014). Future research may continue to shed light on the possible importance of this information for clinical applications.

The AMY is also connected to the anterior cingulate cortex (ACC) and the right hemisphere orbitofrontal cortex (OFC). Both are involved in autobiographical memory and directly inhibit the AMY (LeDoux, 2003). In other words, when an individual draws a representation of a CSR related to a traumatic autobiographical memory, and the OFC or ACC inhibits AMY responses, there are no evocative consequences. With this association weakened, an extinction of the traumatic response can begin to occur. "It's an image of my stepfather shouting at me, but it's only on paper and there will not be an adrenalizing, negative abusive consequence here and now. It's only a red-and-black image of a shout on paper." Unfortunately, even after the extinction of a response, lower storage cells in the basal lateral and central nucleus of the AMY seem to store the trigger and can be re-sensitized to react. Clinically, this may mean that a diversity of interventions is needed to help calm the person (Hass-Cohen, 2015a, 2015b).

Motor Responses

We suggested in Chapter 3 that intentional fine motor activity may activate a sense of control that can mitigate fearful, unsafe feelings and thereby assist in the expression and exploration of basic emotions. Such therapeutic assistance is grounded in the interface of the motor system with the CeN fight, flight, or freeze response (LeDoux, 2003). Motor movements help resolve the fear response, for example, clay pounding and lifting. These movements involve fine and gross motor activity. Activating older reptilian areas, specifically cerebellar-motor-system outputs and involving the basal ganglia engages involuntary and voluntary movements. It also brings online cognitive processes, such as working memory and the planning of future behavior (Strick, 2002). In support of these ideas, research suggests that dysfunction in the basal ganglia or the cerebellum may contribute to behavioral problems associated with depression and autism (Hoshi, Tremblay, Feger, Carras, & Strick, 2005; Timmann & Daum, 2007). Thus it is plausible that large and fine motor movements, such as tapping can calm a fear response (King-West & Hass-Cohen, 2008).

Furthermore, the research of Panzer and colleagues (2007) indicates that there are most likely no direct neural pathways between the lateral prefrontal

rtex (lPFC), and the AMY. lPFC activities which are responsible for higher inking and executive decision making are supported by verbal discourse. nerefore, in order to support change, insight-based verbal therapies must company somatic and behavior-based therapies (Ogden et al., 2006; Pan- r et al., 2007). Recall of fear-based memories, which can be triggered by uching, are survival oriented. Rooted in the primitive brain, they are more ely to invoke unconscious, nonverbal automatic responses. Therapeuti- lly, verbalizing these experiences helps integrate them with higher cogni- e, stabilizing prefrontal functions.

omatosensory Strip

e processing of sensory information generated by touch has been associ- d with the function of the sensory cortex, which is composed of the pri- ary somatosensory area (S1) and the secondary somatosensory area (S2). e organization of the somatosensory cortex, includes both S1 and S2. This similar to the motor cortex found in the frontal lobe, underscoring struc- al communality in the important relationship between touch and move- nt. Both S1 and S2 activate in reaction to physical tactile stimulation alat, 2012). The S1 is activated by mental representation of tactile sensa- ns, which explains why amputees report sensations in phantom limbs amachandran & Rogers-Ramachandran, 2000). Activation of the S2 has en associated with the functioning of the AMY, insula, and hippocampus. s involved in tactile learning and memory, such as recognizing handheld jects. The S1 is located within the post central gyrus of the parietal lobe arlson, 2013). S1 is the main receptive area for creating the sense of touch. e S2 is responsible for the integration of sensory information through con- tions with higher-order functions in the parietal cortex, the insula, and lirectly, the premotor cortex. It is tucked just behind the S1. There is a p of sensory space called a homunculus at the area of the S1. Meaning tle human" in Latin, the homunculus is a scaled representation of the man body (Figure 8.8).

The size of the brain map devoted to certain areas of the body is not pro tional to the size of each body region, but instead depends on the amount importance of somatosensory input from that area. For example, a large a of S1 is devoted to sensation in the hands and lips, while the area devoted he back is much smaller. Rachel's *Mysterious Expression*, a pair of large lips de out of clay (Figure 8.2), intuits this neurobiological phenomenon. as the manipulation of the clay may provide implicit access to nonverbal owledge. This speaks to the mind-body bridge afforded by art therapy, ich can contribute to the profession's effectiveness.

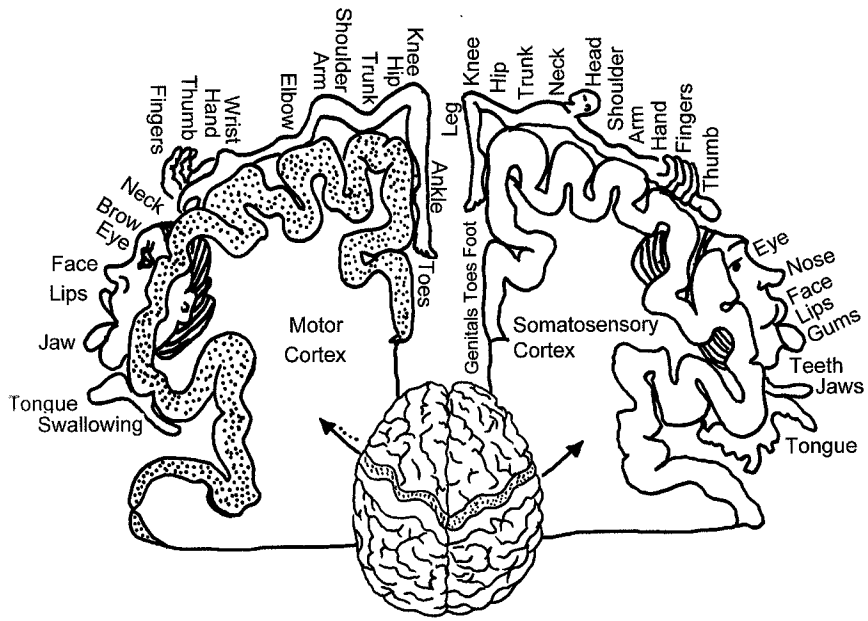


Figure 8.8 *The Brain Represented as a Homunculus.*

Curiously, Rachel's art process reveals how we are primed to access and represent the proportionally larger areas of the somatosensory homunculus. It is as if pressing and touching the clay stimulates ancient dispositions that explain the artist's yearning to draw, paint, and sculpt hands and facial elements as fine art objects. This priming also explains why, as art viewers, we are drawn to portraits and depictions of hands and facial elements. Most evocatively, it offers insight into the fascination that classic images have for viewers, such as Mary holding Jesus and Mona Lisa's smile. Both actual sensory experiences and somatosensory mental representations inform the brain.

Somatosensory cortex activation is foundational for the awareness and processing of sensory information. However, it seems to be an insufficient condition for the mental awareness of touch. It is likely that the reciprocal interactions between the entire somatosensory cortex and other cortical brain areas create awareness, processing, and storage of tactile information (Berry & Hansen, 1996; Gallace & Spence, 2010). Thus, sensations are transmitted from the skin through various afferent neural pathways to the thalamus, which distributes them to the limbic area and specifically the AMY. They are then transmitted onward to areas involving S1 and S2 as well as the parietal and frontal areas of the cerebral cortex.

The Parietal Lobe

Parietal areas interpret touch sensations and forward this information to cognitive areas thus informing us of where we are spatially. Parietal processing integrates touch, vision, and audition (Kalat, 2012). Interestingly, visual information from the occipital lobe of the cerebral cortex has a strong influence on our awareness of the intensity of tactile information. This influence is due to the ongoing repetitive association between visual and tactile stimuli. Thus, the somatosensory neurons respond to visual stimuli associated with tactile stimuli received from the posterior parietal cortex, where both tactile and visual information are processed. The parietal lobe also associates tactile sensations with bodily positions. As we proceed through space, our journey is regulated so that we can choose to touch gently, forcibly, or not at all. This makes personal space around us a felt experience similar to actually touching an object. Positions in space are related to physical touch, which can be environmental, interpersonal, or both. For example, although we cannot see our backs, we can know what is behind us based on tactile information. We know without seeing that when we are seated, there is a chair back behind us. Another example involves negotiating space in a crowded city subway or bus. This requires both maintaining a sense of the space so that one does not fall on another person, and avoiding skin-to-skin contact. The involvement of both subcortical and cortical areas is necessary for tactile consciousness, meaning that managing physical and interpersonal space may become conscious to us only during frontal lobe processes or when necessary. Cognitive, cortical association of tactile information is similar to association of visual stimuli, where the integration of projections from the occipital lobe to the frontal lobes comprises the phenomenon we call seeing (Hass-Cohen & Loya, 2008). This integration of cortical and subcortical functions may explain why we normally experience touch as a unitary sense. Another conclusion from the reviewed neuroscience is that the brain areas involved in the memory for tactile stimuli (anterior and ventrolateral prefrontal cortex, OFC, posterior parietal cortex, putamen, perirhinal cortex, the insula, and the lateral occipital complex) are also most likely involved in the remembered social aspects of touch (Gallace & Spence, 2010). For example, observing professionals as they come into a conference reveals similar nonverbal negotiation. First, they pause, scanning the space and seating options. Then, depending on whether they have come alone or with other colleagues, they will strive to leave an empty seat between them and the next person, or secure seats close to their colleagues. Seeking or avoiding touch is thus part and parcel of interpersonal socialized space.

Finally, tactile processing is strongly influenced by verbal processing

(Tanaka, Fukushina, Okanoya, & Myowa-Uamakoshi, 2014). The conglomerate of touch, vision, and auditory information forms the sensory backbone of verbalized social memories.

> *The sensory memory of my mother sitting on her stairs and stroking my hair, brushing it again and again, in a valiant yet critical effort to keep those curls in check, gives me goose bumps. The close quarters of the cool marble stairs, shielded from the blazing heat, which led out from her kitchen to the back yard, are now long gone. But the daily strokes of my hairbrush going in and out and the memory of marble on the soles of my feet and the stories that I tell myself about her are here with me as I paint long and tangly strips of brown paint.* Noah Hass-Cohen

The Insula

Insula function is another example of the connection to bodily sensations. Considered the fifth lobe of the cerebral cortex, it is responsible for processing stimuli that arise within the body. The insula also notices ongoing bodily conditions in others, contributing to our ability to understand and to empathize with others. Furthermore, its cortex plays a part in regulating extreme emotions, awareness, and expressions of bodily states, such as disgust and pain (Carlson, 2013).

Body image is composed of primarily visual characteristics, whereas the body schema has proprioceptive, tactile, and kinetic aspects. The two are intertwined and usually inseparable, yet each contributes differently to the awareness of bodily and interpersonal touch. Researchers studying the neural correlates of the affective aspects of tactile processing implicated the insular cortex in our emotional and hormonal responses to tactile contact (Wessberg, Olausson, Fernstrom, & Vallbo, 2003).

Neurotransmitters

Breast-feeding, social grooming, and other occurrences of nurturing interpersonal touch can activate a number of neurotransmitters, including norepinephrine and serotonin, as well as oxytocin, known as the bonding hormone (Kravits, 2008b). Lack of touch has been linked to a cycle of reduction in serotonin circulation and maladaptive outcomes, such as feelings of depression. Norepinephrine depletion may mean that high levels of dopamine and the accompanying impulsive behavior will not be checked or inhibited, a result often linked to aggression in children. Field (2004), a primary researcher

rea of touch for children, suggests that massage therapy can increase
ephrine and serotonin levels, which in turn may inhibit such exces-
amine release.

CREATE PRINCIPLES AND CLINICAL APPLICATIONS

mary focus of the studio art therapy activities in this chapter is the
'E principle of Expressive Communicating of pleasant, unpleasant, or
r-based experiences. In this context, group members sculpted a series
nal representations, making large, medium, and small objects, with
fferent clays. We also discussed the different types of touch and
sized on the therapeutic advantages and neuroscience of AMITS.
n the very beginning, clients experience different types of art therapy
rs to touch, which engage a variety of relational and emotional
s. For example, the rise of unconscious emotional reactions may be
by even the simple presentation of materials. Opening a package of
a or Sculpey may be experienced as a gift, something special, either
ement or something not to be touched. The block of wet clay may
pproachable, or too dirty, or with a definite odor. These internal
ions predispose the clients' emotional senses and, at times, may also
ings of safety or danger, depending on the associated memories.
postulate that engaging limbic structures, such as the AMY, in the
stimulation of working with clays provides access to basic emotions.
tely working with clay stimulates the rich interaction of limbic, cor-
l bodily sensorial pathways, permitting access to implicit emotional
s. Handling the different clays can trigger a wealth of emotional
n through physical contact and movements, including tearing,
punching, slapping, and piercing wet clay, as well as rolling, flatten-
eling, and sculpting finer clays. These expressions can also be accom-
y a variety of smells. The vividness of colored clays, such as the
clays, stimulates further emotional reactions and processing.
ensory stimulation of working with clay models also engages motor
ills, bodily awareness, and motivation, which are Creative Embodi-
antages. The different qualities of the three kinds of clay require
use a variety of motor skills, ranging from large gestures needed for
p and kneading the earth clay to fine motor manipulation for the
modeling of polymer clay. Experimenting with the object sizes also
he practice of a variety of motor skills that contribute to emotional
itive familiarity, and a sense of empowerment and accomplishment.
or movements involved in handling clay promote sensory haptic
es that access clients' memories associated with interpersonal touch

and space. As discussed, beholding the art and the art making initiates movement and organizes how group members move around within the space. In addition, as clients navigate the shared space of the studio, moving among the tables that hold clay, the toaster oven that bakes the polymer clay, and areas such as cabinets where the earth clay dries, they begin to accommodate everyone's personal space and needs. Similarly, at each table, the sharing of materials calls forth gestures and motions supporting real or symbolic touching of each other's productions. Opportunities spontaneously arise through this movement for accidental and instrumental touch, which shape the interpersonal space. Symbolically, the playful manipulation, touching, and placing of the self-made Human Figurines can invite clients to experiment with sharing and controlling interpersonal space. Modulation of interpersonal space via mirrored touching, gesturing, sitting close or far, and turning toward or away from others further complements the attuned therapist's ATR-N microskill set.

The CREATE principle of Relational Resonating is deeply embedded in the experientials' focus on touch. The request to represent Personal Objects and Human Figurines creates a contagious social environment that is infused with personal meaning, mentalizing and reflection. Therapists can aid this therapeutic and creative expression by anticipating and structuring the process by thinking ahead, foreseeing the pitfalls of unfamiliar media, and attuning to technical mishaps. The art therapist's microskills can promote a strong sense of safety and emotional comfort for clients. To illustrate, we advocate advising clients to start by taking hold of portions of clay that feel just the right size in the palm. The manageable size combined with the direct sensory experience can aid in the self-regulation of comfort. We offer soft pieces of cloth to work on, which contain dry fallout from the clay and permit easy handling and removal of the work from a surface. Propping up a delicate piece of clay work with foil gives it support, while painting white carpenter's glue or acrylic paint on wet clay assists the drying process, prevents cracking, and gives color and sheen. Explicitly referencing and verbalizing the type of touch, such as, "May I hold and support your clay sculpture?" brings awareness of the dyadic nature of the client-therapist-client relationships. Thus, awareness of interpersonal touch and space becomes an experience of symbolic and concrete relational connectivity. Salient emotional meaning may then be instilled into activities, such as placing Plastilina in a cool place where it will not fade or melt, wrapping ceramic objects so that they dry as slowly as they need to, and talking through an ambitious construction.

The ATR-N therapist's microskills described in this chapter are much more than the skills of a craftsman. They have critical therapeutic meaning as they embody the maker's "third hand" and "third eye," and perhaps even a

"second mind." The third hand represents the task, and the third eye leads to intuiting what kinds of supportive touching are needed, whereas the "second mind," a term that we came up with, is the social mind that knows what the other intends to represent. It is a practical application of theory-of-mind constructs (Frith & Frith, 1999; 2003; 2006).

Working with clay can also readily access attachment IWM and memories. Affect based autobiographical memories are seated in the limbic system and linked to the OFC brain region, an area that has a key role in the regulation of affect and attunement. Such linked areas are also appraisal centers for visual and sensory-haptic inputs. Instrumental and task-oriented touch, as in the handling and exchange of materials, provides a way for the therapist to touch subcortical and cortical-symbolic levels of representation, connect emotionally, and reach implicit affect regulation states with the client while deliberately developing intentional relational attunement. The therapist is intimately present, touching the self of the client via her or his self-objects, and providing a container for emotional and sensory experiences.

Working with the variety of different clays can be a challenge. Each kind of clay requires different handling and skills that are often demanding, eliciting the CREATE principle of Adaptive Responding. The challenge of making complex clay sculptures, or having one's work witnessed by others, stimulates discussions about fear and performance anxiety. Offering a variety of different clay types is an ATR-N clinical skill, providing the opportunity to practice coping skills. A range of structured to less structured safe art therapy media provides contexts where modeling highly controllable plastic-based clay can calm and focus. In contrast, messy water-based clay may excite or stimulate uncertainty and fearfulness (Malchiodi, 1998a). Stimulation from touching as well as exchanging the media may engage sympathetic nervous system responses that are alarming or excitatory, or inhibitory parasympathetic coping responses. The therapist's guidance and task-oriented touching support coping and the building of increased tolerance for affect, whereas incidental or controlling touches may create the opposite effect. The Imagined Loved Landscape environment provides opportunities to revisit sensory-based memories of times and places where support was available or experienced.

The opportunities for supporting the CREATE principle of Transformative Integrating are present within the relational context of working with clay along with others or a therapist. Within a safe therapeutic relationship, the kinesthetic, emotional, and meta-higher-cognitive processing involved in working with clay supports integrated meaning making and elaboration of coherent narratives of self and other.

Experiences of felt and anticipated aid support the emergence of Empathizing and Compassion. The therapist, who is the "third hand," "third eye,"

and "second mind," overtly and symbolically empathizes with the client's needs. In addition, mirroring, echoing, and imitating clients' hand gestures form a language that conveys understanding and empathy. Different types of touching, such as reference to features and appearance and pointing, as well as talking about the art, convey relational interest and caring. In essence, these microskills model compassion building. Instrumental touch, the intent of which is to help convey prosocial meanings, is augmented by task-supportive touch. Furthermore, mindful attention to types of touch supports mutual empathy, insight, and compassion. The client also has the opportunity to mimic the therapist's hand gestures and work, forming a language that conveys understanding and empathy. Such reciprocal dialogue moves the client toward experiences of felt and anticipated aid and the CREATE principle of Empathizing and Compassion. We expand on these last ideas in Chapter 13.