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Awareness Through the Senses: A Multisensory Approach to Improvisation

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Awareness Through the Senses:
A Multisensory Approach to Improvisation
by
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Submitted in partial completion of the Master of Science Degree in

Dance/Movement Therapy at Sarah Lawrence College

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Abstract

This paper will discuss some of the artistic practices of dance improvisers which can be utilized to enhance sensory awareness. Similarities to witnessing internal experience derived from Authentic Movement practice are utilized to connect the artistic to the clinical experience. Artistic practices related to as well as neuro biological function of several sensory systems of the body are discussed to present some of the benefits and challenges to increasing awareness of these various senses. Clinical application of the material for select populations is also discussed.

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Awareness Through the Senses:

A Multisensory Approach to Improvisation

When I return home after a long day, one of my favorite things to do is to turn a knob on the front of my stove to heat up some soup made the day before. This soup, Ribollita, is a combination of beans that I had let soak for a day, *soffritto*, or carrots, onion, and celery softened in olive oil, shredded kale, potatoes, peeled tomatoes, and 4 slices of stale bread. What does a description of my dinner have to do with Dance/Movement Therapy? For me, the soup is not just fuel, not just nutrients that keep my body from dying; when I cook, I am connecting to the Earth. I am using carefully selected raw ingredients grown with love and transforming them into a new product that I can savor with more of my senses than just taste. The preparation involved chopping, peeling, stirring, and watching the pot, mixed with periods of waiting which filled the room with a fragrant aroma and bubbling sounds as the mixture of vegetables and water transformed into my creamy soup, creating an environment of anticipation. When I sit down to eat the soup, even a day removed from the labor of preparation, I am able to appreciate the soup's flavors and textures each spoonful at a time, feeling satisfied by my labors. The act of eating becomes a ritual and full of enjoyment.

In the same way, when I decide to make a dance, I am involved in a creative process. Much like when I cook, there is a sense of ritual and connecting to something else, whether that be the Earth, my Spirit, another human being, or an emotion or other type of sensation that is emerging within me. Sometimes this process is planned out, but other times I start to make something without even knowing what will emerge. Engaging in the act of preparation is an important ingredient to this process; it creates a sense of ritual and meaning. External and internal conditions may not always be perfect, but if I start with breathing deeply, my

nervous system starts to calm as I oxygenate the cells of my body and I start to expand my movement range and repertoire. As I start to move, my perception changes, as my weight shifts and I am opened up to new possibilities. As I become aware of the space within my body I am able to feel more confident. This confidence comes from an increase in mobility and a sense of space within myself, which help me to feel expansive outside of myself; I feel like I have an infinite number of possibilities. When I start to move, I discover new possibilities, which surprise me and bring me joy.

There is a creative process inherent in various improvisational movement forms and practices which utilizes sensory information to create movement. This sensory information is used to train the body/mind to focus its attention on one particular aspect of the experience of the mover, resulting in more awareness of self and the environment. Engaging in the act of preparation is an important ingredient to this process; it creates a sense of ritual and meaning. External and internal conditions may not always be perfect, but starting an experience with breathing deeply gradually calms the nervous system as it oxygenates the blood, carrying nutrients to each cell in the body. As this happens, the mover's connective tissue relaxes as the mover's body starts to feel safer, allowing for more expansive, less inhibited movement. Physical movement inherently shifts the perception of the mover as s/he moves in space, challenging the vestibular system to constantly re-orient the mover in space. When this movement is not consciously planned ahead of time, this process also includes a surrendering of the conscious to the unknown; a voluntary loss of control and surrendering to sensation. A simple shift of weight opens up to new possibilities as one anchored body part gives freedom of movement to another. As the mover becomes aware of the space within the body, more confidence emerges; as proprioception increases, the ability

to move with more awareness in space also increases. This confidence relates to the relationship the mover has to the self as well as to the environment. It comes from an increase in mobility and a sense of space within the body, allowing the mover to feel expansive outside of the self. As the mover starts to move, new possibilities are discovered, which can be surprising and allow the mover to experience pleasure or joy during a movement experience.

The senses are a gateway to understanding the body and experience in the body. They shape both implicit and explicit memory, making them powerful tools for reflection, increased self-awareness, and re-patterning or shaping new experiences. Each sense relates to functions of the brain in different ways, therefore shaping experience in their own unique way. For example, smell goes straight to the emotional brain or limbic system. Other senses are filtered through thought, such as sight which is filtered through the visual cortex to not only perceive depth, but also to make meaning out of visual stimuli, making use of memory. These memories help us make sense of our world, using previous experience to help us make sense of current experience. Some reactions to stimuli are biological but many are shaped by our own unique relationship to the world.

On one level there are implicit memories that are formed prior to the acquisition of speech, shaped by interactions with our caregivers. On another level, there are explicit memories that are formed from processing information in a more cognitive manner. In this way, each person has a unique body image that is informed by experience through sensation, body schema, as well as cognitive processing, always in relationship to another person, environment, or cultural system.

Attention in Improvisation

Improvisational dance encompasses a wide variety of dance forms that are both social and performative. While there may be differences in where the content and form come from; whether it is from internal sensation, or relating to people or objects in the dance environment, there is a heightened sense of presence and self-awareness that improvisation requires as the participant is required to make decisions in the moment. This ability of being present and aware of internal stimuli and/or external surroundings is a skill set that can be developed through practice and can be transferred out of the performance and practice realm into other areas of life.

Many improvisers have a practice or way of approaching the space and time in which they are about to move; a preparation. For example, in the Underscore, a dance score created for Contact Improvisation (CI) by Nancy Stark Smith, the first two phases are “Arriving Energetically” (Koteen & Stark Smith, 2008, p. 91) and “Arriving Physically” (Koteen & Stark Smith, 2008, p. 91). In this way, the mover¹ is present with his/her focus and attention, as well as aware of sensation within the body. This sort of preparation is not about doing specific tasks to prepare the body to move as some people may do in a dance class, but it is an approach to movement that is about being in the moment; present to what is happening in the body and in the room. Stark Smith describes this process as a frame that allows space for “people who work with their own bodies” (DeSpain, 2014, p. 154) while also providing some choices for people to work with. In an interview with Kent DeSpain (2014) she described

¹ To maintain continuity, the term mover will be used throughout this paper to describe the person engaging in movement and sensing.

“three major areas of resource” (p. 154) that she directs participants in her workshops to explore during this arrival time:

...one of them is the sensations in your body right now that’s telling you “oh it would be nice to stretch this” or “I need this” or “I want this.” And another is your memory or your history of things...everything you’ve ever done and that you know how to do that could maybe meet your needs, or that you might want to do. And the third is the environment and the things that you’re stimulated to do by what you hear, what you see, including what other people are doing. So that’s available to you. That level of memory is there. (p. 154)

While Stark Smith offers both internal and external stimuli as options for “arriving physically,” she starts with bringing attention to the sensations the body feels in the present moment and encourages an indulgent use of time. There is a specificity to this type of attention that is sequential, at times including the location and texture of sensation in the body, an observational awareness of the breath, both inhalation and exhalation, the sensation of muscles stretching, the movement inside a joint, the tactile sensation of the body in contact with a surface such as the floor and the sensation of weight. This type of specific attention creates a magnifying effect of sensation and is, as Steve Paxton states like “using the mind as a lens into the body” (Koteen & Stark Smith, 2008, p. 91). *Arriving physically* operates on its own time; “body time” (Koteen & Stark Smith, 2008, p. 91) allowing sufficient time to recognize sensations and then take in information from them. This is different from performing a specific task; it creates space for the mover to become more present in the body.

Another principle that Stark Smith uses in the Underscore is the “Idiot button” (Koteen & Stark Smith, 2008, p. 96). When the mover becomes over-stimulated because of an awareness of too many things at once, the “idiot button” (Koteen & Stark Smith, 2008, p. 96) can be used to begin to focus on the basics of moving, “presence, breath, sensation” (Koteen & Stark Smith, 2008, p. 96). There is so much to be gained by bringing awareness to these three things. This idea also frees up the mover to not judge the need to simplify focus while also learning to self-regulate; knowing when the mind or the nervous system is overtaxed and letting it rest. Stark Smith acknowledges an important reason for simplifying what the mover is tracking is for safety. In addition to safety, it increases the somatic intelligence of the movers (De Spain, 2014). This aspect of the Underscore is rooted in the CI paradigm that prioritizes the movers’ attention to the point of contact; the negotiation of weight sharing, the use of momentum and the quality of touch, over a focus on generating movement or creating interesting movement. Kent DeSpain (2014) describes this as a focus on *effective* movement over *interesting* movement. This shift focuses on the human relational aspects of dance and prioritizes them over visibly aesthetically pleasing movement. This also relates to Stark-Smith’s “Telescoping Awareness” (Koteen & Stark Smith, 2008, p. 96) that lets the mover shift awareness or focus, either from one tiny sensation in the body to a broader sense of where the mover is in the space, or in reverse; going from global to very specific.

The improviser’s relationship to the space or the other movers is a cultivated relationship that varies from practitioner to practitioner, but there are some connections. For example, in Contact Improvisation, there is a relationship that is maintained between two people. Each mover attunes to the shifting weight of the other mover, initiating, responding,

and mutually deciding to move. This focus on weight and the center of gravity shifts the exploration from an external focus to an internal focus. The space in which the movers are moving is spherical and the skin is sensitized in a way that is unique to being physically in contact (Buckwalter, 2010).

Some dance improvisers, who do not use physical contact in their dancing, consciously build receptivity to the environment, including developing intentionality toward the other movers with whom they are dancing. For example, Katie Duck's work explores perspective of space. In traditional dance choreography the dance is made with an audience as a spatial reference. Duck changes this perspective to be improviser centered. When dancing choreographed dances, frequently there are entrances and exits. During the exit dancers often drop all of their energy and go into a passive physical state, losing attention. Duck proposes the idea that the improviser is always onstage, whether physically onstage or offstage. Her perspective on exiting a physical space is that it creates space for movement, much like a musical rest creates space for a new musical phrase (Corbet, 1999). Duck uses "flow/pause/exit" (Buckwalter, 2010, p. 87) to develop an awareness of how being still, in and out of the space can create room for movement. Her perspective is that the improviser does not need to make interesting movement, but allow space for something to happen. While Duck's approach to developing an awareness of time in space comes from her collaboration with musicians, the paradigm that she operates under, allowing space for a movement to happen instead of focusing on invention relates to the Japanese concept of *Ma*. Akaji Maro explains that:

In Japanese *ma* refers to the space between, an interval, spatial, or temporal. People wonder, “What is this *ma* trying to ask? What is it trying to do?” It is here in this space between that spirits and gods dwell. (cited in Blackwood, 2002)

Ma poetically describes how creating space draws the audience into the presence of the performer, inviting the viewer into the experience of the performer instead of creating an experience for the viewer to passively follow as is the custom in traditional western theatrical dance. In this invitation, the imagination and experience of the viewer becomes a part of the performance.

Nina Martin’s *Ensemble Thinking* training enables performers to develop conscious, intentional compositional skills. This training has various components and was developed in reaction to typical slow speed, “amorphous” (Martin N. , 2007, p. 12) use of space and overly complex movement that frequently occurs in group improvisation. There are a few structures that are utilized: “One Idea,” (Martin N. , 2007, p. 13) “Status work-taking focus” (Martin N. , 2007, p. 15) and “Status work-giving focus” (Martin N. , 2007, p. 14). Martin (2007) begins by teaching “One Idea” (p. 13). This structure calls upon one mover to initiate a movement idea that the rest of the group sequentially finished, creating one unified idea. This work forces the participating movers to become comfortable with conformity, prioritizing the group composition over individual expression. After this work is able to be executed with greater ease, the movers move onto Status Work. The Status Work is “adapted from Johnstone’s ‘status work’ for actors” (Martin N. , 2007, p. 14). Initiating with giving focus, 5-7 volunteers organize themselves in relationship to one person in a way that gives “high status” (Martin N. , 2007, p. 14) to that mover; essentially learning how to draw attention toward another person. “Taking Focus,” (Martin N. , 2007, p. 15) the second aspect of Status

Work works in the opposite order; when a name is called, that mover moves into a place of high status, or the “hot spot” (Martin N. , 2007, p.15), the place where the eye is drawn when watching a performance. This is a bold action that may take some time for shy individuals who will often hesitate to place themselves. While the movers are organizing themselves with an audience in mind, they develop a sense of ensemble, understanding how to support each other to achieve their goal. In this way, each mover learns how to be in the spotlight and how to support other movers both spatially and energetically (Buckwalter, 2010). This is a skill that translates outside of performing and into life. At times it is necessary to lead or take the initiative to start something, while at other times it is necessary to support other people, whether in a job, a community project, or as a parent or guardian. Different people have different comfort levels being the center of attention or being in the periphery, but life requires a balance of these two functions in relationships. By embodying a role that is not a person’s preference, the person may start to become more comfortable in that role when it is translated to other aspects of life.

Dana Reitz’s solo work is informed by her study of calligraphy. The calligrapher prepares all his or her materials ahead of time. The preparation involves purposeful selection, creation and preparation of materials not limited to selection of a well-lit space, the work surface, the paper, brushes, and hand ground and mixed ink. The calligraphy is the spontaneous result of all these preparations coming together in the moment. When Reitz is going to dance a solo, she prepares ahead of time by drawing or photographing the space to get to know the architecture. She will come with some movement material, but believes that the mover is not responsible for what happens in the space, but for the attention s/he brings. In this way, she “listens” to the space, responding with the entire body. In this way a

partnership with the architecture of the space is created that is full of attention (Buckwalter, 2010).

Nancy Stark Smith also uses the metaphor of “listening” (Koteen & Stark Smith, 2008, p. 96) to describe “keeping your ears and the other senses open. Noticing the sounds and its connection and coexistence with what you’re doing and what’s happening in the room” (p. 96). This form of attention is relational and contextual in the present moment. Allowing the senses to stay open to environmental input allows for relationship to form. An emphasis is placed on responding and intentionally relating to what is happening around the mover.

It is often necessary to begin the process of becoming aware of movement and sensation at a slow pace. In this way, the mover starts to draw their attention to what is happening inside the body in stillness, or to the shifting weight or the subtle changes in sensation during movement. After this awareness is developed, more complex movement patterns or awareness at a faster pace can occur. This may be a factor in why many meditation practices happen in stillness or slow motion, as well as a justification for why many post-modern dance and somatic practices start out with slow movement that enables the mover to sense their body in space as opposed to movements that warm-up muscle groups like an athlete may warm up before a game or training.

While the work of these improvisors is mostly for artistic expression, the creative process can have healing qualities. All corporeal memory that corresponds with both implicit and explicit memory is part of right hemispheric brain processing that relies mostly on intuition. It is not as valued in most Western societies that favor the cognitive and intellectual control of left hemisphere processing. A balance between the two hemispheres allows for the

conscious brain to be aware of feelings and sensations and ascribe meaning to them. Otherwise, unconscious behaviors that do not serve a person well can repeat in her or his life. Movement that has a meditative quality can be a good way to integrate the two hemispheres of the brain as it incorporates both cognition and bodily sensation. By slowing down the speed of movement, the mover can become more aware of what is happening in the moment and then ascribe meaning or significance to it. In this way, aspects of improvisational dance techniques can be utilized to increase sensorial awareness and integrate the two hemispheres of the brain. As Cozolino suggests, lateral integration is most likely experience dependent as the therapeutic process involves co-constructing narratives that identifies feelings and integrates them into experience (2010).

Authentic Movement

Mary Stark Whitehouse, the originator of Authentic Movement, originally called it Movement in Depth, reflecting her own influence from the study of Jungian psychology (Whitehouse, 1979). This approach to movement happens in a dyad, much like the development of a child. The child develops the ability to perceive the world through all of the senses when seen by the good enough mother; the mover is seen by a witness (Stromsted & Haze, 2007). The mover moves with the eyes closed in order to detach from external stimuli and connect to internal sensation. However, before any movement happens, the witness makes sure that the space is secure and provides the “holding environment” for the mover to move in; just as a mother contains a complete range of expression of emotion for the developing child, the witness provides a container for the mover to feel safe enough to move freely in (Stromsted & Haze, 2007). Mary Stark Whitehouse described how increased

awareness can occur even for only a moment while the mover in an Authentic Movement experience is moving:

The core of the movement experience is the sensation of moving and being moved.

There are many implications in putting it like this. Ideally, both are present in the same instant, and it may be literally an instant. It is a moment of total awareness, the coming together of what I am doing and what is happening to me. It cannot be anticipated, explained, specifically worked for, nor repeated exactly.

In order that it may happen, one must have a bodily awareness of movement.

(Whitehouse, 1999, p.43)

Using the Senses to Increase Body Awareness

Delimitation is the process of selecting to place limits on a process in order to fully develop the selected aspect. This is used as an artistic tool to help the development of a certain capacity. For example, in order to develop a strong sense of the spatial relationship between dancers, Nina Martin asks dancers to whom she is teaching her *Ensemble Thinking*, to delimit their movement vocabulary to just “pedestrian” movement such as walking, sitting, or standing (Martin N. , 2007). By delimiting the movement vocabulary the emphasis is on the spatial relationship, not the movement itself. In Authentic Movement, the mover closes the eyes, which in turn quiets the mind and heightens the sensory experience of other senses such as touch, sound and smell. By closing the eyes, attention is drawn inward, creating space for unconscious material to arise as the mover waits for an internal impulse to move (Stromsted & Haze, 2007).

Interoception

As the practices of some of the aforementioned improvisers focused on attending to an internal sensation or impulse such as a shift of weight, or the sensation of breath or muscles stretching allows the mover to acclimate to the dancing environment and informs decision making. These practices can all be described as interoception. While interoception was initially defined as the sense of the viscera, Craig (2002) suggests that it should “be redefined as the sense of the physiological condition of the entire body, not just the viscera” (p. 655). This shift is due to recent study of the lamina I spinothalamocortical system, which, “is a homeostatic afferent pathway” (2002, p. 655) that transports signals from all body tissues to the spinal cord and brainstem, complementing the “efferent autonomic system” (2002, p. 655) in order to maintain homeostasis. This afferent function “generates a direct thalamocortical representation of the state of the body in primates that is crucial for temperature, pain, itch and other somatic feelings” (2002, p. 655)

Equilibrioception

The vestibular system is primarily located in the inner ear in the vestibule which contains both the organs for hearing, the cochlea and for balance, the semicircular canals and the otolith. The semicircular canals detect turning of the head and the otolith detects motion in a linear pathway, tilting of the head and the orientation of the body in respect to gravity. One of the first senses to develop in utero, the vestibular system plays an important role in how humans interact with their environment and provides a sense of well-being or distress depending upon how it is stimulated. However, development of this system is slow, as myelination of certain pathways continue to develop until puberty. Additionally, as it is connected to the brain stem, the function of equilibrioception is below consciousness and

cannot be directly manipulated like the eyes or the musculoskeletal system. It is indirectly accessed through motion of the body (Eliot, 1999).

Exteroception

Vision

Vision affects perception. The eyes can be used in both a receptive and projective way; allowing information to come in and reaching out to bring information in. Focusing the eyes on a specific point or task has the effect of channeling focus, not allowing other input in. The opposite of this type of focus is often called a soft focus and uses peripheral vision. A fundamental difference between these two types of eye focus is the amount of effort used. While channeling focus there is effort used to block out extraneous areas in order to focus. Using a soft gaze requires a relaxation of the eyes in order to allow input to be received by the eyes. For people who have grown up in a setting where hard work and concentration were highly valued learning how to use a soft gaze at times may be a challenge as the eyes have been accustomed to using a high amount of effort or at times strain (Quackenbush, 1997).

Vision is also affected by desire and anxiety. Early in development infants often learn to move their bodies by changing their gaze (Tortora, 2006). Looking toward a desired object or a sound will trigger a roll or a push and then reach (Tortora, 2006; Cohen, 2012). These purposeful and accidental movements provide feedback to the infant, providing information about the physical and visual relationship to the world. This exploration is fueled by the infant's curiosity and increases self-awareness. Much in the same way that the 3-12 month old infant uses curiosity to motivate attention through the eyes and then curiosity and desire to explore space by purposefully reaching out, the improviser brings a curiosity to

her/his exploration, which can also be activated through the use of the eyes to initiate movement and create relationship in the space and with other people.

How the eyes are used can affect the resultant movement in an improvisation or the emotional quality of the mover. For example, Barbara Dilley uses what she termed the Five Eye practices: *closed eyes*, *peripheral seeing*, *infant eyes*, *looking between things*, and *direct looking*, to expand the dance improviser's use of the eyes while improvising. *Closed Eyes* provide for introspective exploration as visual stimuli is eliminated from the sensory experience causing the mover to "look inward" and rely more on other senses. *Peripheral seeing* allows the mover to see what is to either side, allowing for a more expansive field of vision, allowing the improviser to become more aware of people and objects in the periphery and therefore dance in relationship to his/her surroundings. *Infant eyes*, as the name suggests, relates to how infants gaze at their surroundings to take in the environment in what Dilley perceives to be a non-analytical way; freely scanning without any need to name anything. *Looking between things* provides a source of inspiration for directional movement as it gives the improviser directional focus and spatial intension. Lastly, *direct looking* asks improvisers to look directly at another person, not necessarily in the eyes, but to find something specific to look at, feeling the intention and focus without the cultural and social pressures of eye contact (Dilley, 2005).

Many dance improvisers created their approach to using the eyes in an intentional way because dancers used to doing choreography develop certain patterns of using their eyes (Buckwalter, 2010; Brodie & Lobel, 2008). Just as dancers develop patterns, any person can develop a tendency to stay with a certain preference for seeing. Katie Duck divided eyesight into categories based on distance: close or short-range gaze, mid-range gaze and a longer

gaze. The use of these ranges influences the experience of the improviser. For example, the short range allows for awareness of the person moving, seeing one's own body or a person nearby. Mid-range gaze allows for a more social interaction; seeing another person in space and connecting to them in some way. Long-range gaze allows for large movements and locomotion as it allows the improviser to see the whole space; the periphery (Buckwalter, 2010). In this simple orientation to a space, the mover starts to use his/her gaze in a way that can inspire different kinds of intentions and movements, internal, social or expressive.

While the practices that I have described so far enlist a range of foci for the eyes, a practice that develops one particular kind of focus is Contact Improvisation(CI). In CI, movers use predominately a soft, peripheral focus. This type of focus allows for greater awareness of peripheral kinesthetic sensing as the body is moving in a 360 degree orientation to space with a partner, requiring a peripheral use of touch and sight to create proprioception of oneself and a sense of self-orientation in a practice that is disorienting spatially. This use of peripheral vision allows for the spatial disorientation process to happen. If the improviser tries to fix his/her eyesight on specific points in order to orient in space s/he will not be able to move as freely, be as sensitive and responsive to the sensation of touch from her/his partner or open to the gravitational or momentum based options of movement. A soft peripheral gaze allows for awareness of internal sensation and enough of the environment to remain safe without impeding the flow of movement or the inherent disorientation that follows (Paxton, 1975, 1986, 2003).

Audition

Sound is created by the reverberations that travel into the ear canal where they are transformed into mechanical energy. In the inner ear at the cochlea fibers of the cochlea

nerve detect individual frequencies and convert those frequencies into electrical signals that are then sent to the cochlear nucleus located in the medulla, a part of the brainstem. There are several functions that happen rapidly via neural pathways from the ear. One important and initial function happens when the impulses are synapsed to the cochlear nucleus and the superior olive where the location of the sound is located using intensity and lateralization of sound frequencies. When the impulse reaches the inferior colliculus, a known reflex center of the brain, the localization information is sent to the visual system, causing the eyes and head to turn toward the stimuli (Soderquist, 2002). Listening is not just hearing, it involves the ability to filter, analyze, and respond to sound. Therefore listening requires more attention than just hearing or passively receiving auditory input from the environment. Listening is an active activity that can be practiced and improved through practice (Jensen, 2000).

Sound can have an impact on how the individual experiencing it feels. Due to the fact that every tissue in the body has its own frequency of vibration, just as movement stimulates the vestibular system, sound can also have a calming or exciting effect on the nervous system of the listener (Jensen, 2000). For example, the tone of voice used to communicate with someone can alter how the receiver of sound feels about hearing it. Music, a highly organized sound can affect different people based on their cultural background and individual taste. Hearing a song that was played at a memorable moment in a person's life can trigger memories of the original experience or similar feelings to what was experienced in the original event due to the activation of the amygdala, which mediates strong emotional episodes in conjunction with the hippocampus, which mediates semantic and episodic memory, the temporal lobes of the cortex, which facilitate semantic retrieval,

with the procedural and reflexive learning and conditioned responses of the Cerebellum (Jensen, 2000).

One approach to sound that allows for the development greater awareness is to practice noticing sounds in the environment without categorizing them or ascribing meaning to them. In this way, the listener is aware of what is in the environment without allowing it to affect how s/he feels. This approach to listening is informed by certain meditation practices (Zajonc, 2009).

Olfaction

Smell utilizes the olfactory epithelium, which interpret aromas that enter from the nose or up the back of the throat from the mouth. The olfactory epithelium contains millions of neurons which trigger an electrical signal to olfactory bulb and then to the cortex and the limbic system at the same time, allowing the brain to both recognize and ascribe meaning to while also archiving an emotion related memory. There are 350 types of receptors in the human being, which can detect over 10,000 different odors when stimulated. Some odors like lemon and mint are made up of just one molecule, while others like an apple or coffee contain a combination of molecules (Laska, Genzel, & Wieser, 2005; Soderquist, 2002 ; Kolb & Whishaw, 2003).

The reward system of the brain is activated when a person who is pre-disposed genetically to addictive behaviors smells a substance that is desirable such as sweet or fatty food or alcohol (Martin, G. N., 2013). Developing an awareness of feelings and sensations that are aroused due to smell can be important for the treatment of people with addictive behaviors such as substance abuse and obesity.

A study (Bragulat et al., 2010) that utilized fMRI to compare the response of lean and obese individuals who had fasted for 24 hours to food and non-food odors revealed that blood flow increased in all participants more for food odors than for other odors. Blood flow increased particularly in the orbitofrontal cortex responsible for conscious perception and identification of a smell, bilateral insula, operculum, anterior/posterior cingulate and ventral striatum, which are involved in reward prediction and anticipation (Haber, 2011). There were some differences in blood flow between obese and lean participants. In the obese participants, there was greater bilateral activation in the hippocampus and parahippocampal gyrus, areas of the brain located in the limbic system and associated with object recognition and memory consolidation. However, in the lean participants, there was more activation in the posterior insula, suggesting an ability to have more conscious awareness of desire. Bragulat et al. (2010) noted that activation in the hippocampus and parahippocampal gyrus was similar to activation resultant from addictive substances, showing similarities in obesity to addictive behaviors. The dopamine system projects dopamine cells into the hippocampus when cues such as smell in the environment which are similar to cues associated with previous experience with drugs and food respectively. This produces the subjective experience of want or desire (Bragulat et al, 2010; Martin G. N., 2013; Kolb & Whishaw, 2003).

Gustation

Taste utilizes both the taste buds and the olfactory receptors in the nose. While chewing, the tongue and the nose work together to distinguish flavor. Taste receptors in the mouth in conjunction distinguish generic characteristics while aromas travel in the air to the olfactory receptors where the nose distinguishes more specific scent characteristics. This is

why taste is less intense when the nasal passages are congested. Taste buds are located on the papillae of the tongue. In the back of the tongue are groupings of cells which act as receptors for every taste. When the receptors unite with corresponding food molecules it triggers an electrical response to the brain, where it recognizes the taste. To date there are five tastes: sweet, bitter, sour, salty and umami. There are other sensations other than taste in the mouth, such as spiciness and astringency. Spiciness is not experienced by everyone with the same intensity. When pepper is eaten, capsaicin molecules are dissolved by saliva. These molecules join with receptors in the trigeminal nerve which detects temperature. Menthol also reacts with receptors in the trigeminal nerve to give the sensation of coldness in the mouth. Another mouth sensation is triggered by foods such as artichoke and unripe fruit and drinks such as tea and red wine. These substances contain tannins which reduces the capacity of saliva to lubricate the mouth, creating a sensation of dryness. These molecules are responsible for what is called astringency (He, Tian, Luo, Qi, & Chen, 2015; Martin, G.N., 2013).

Tactile sensations are also used when eating. For example some foods can feel rubbery or soft, while others can feel hard or crunchy, and still other feel creamy and more still smooth and/or sticky. These sensations stimulate nerve endings in the oral cavity, creating an electrical connection to the brain so that it can distinguish texture. This sensation is augmented by the sensation of sound, which aids in detecting whether a food is crunchy, crumbly, or creamy for example (Essick & Trulsson, 2009).

Each of these specific sensations that are utilized while eating, taste, trigeminal, touch, smell, and hearing are first localized in specific regions of the brain, but are then later

combined in the frontal cortex to create a mental image which is called flavor (Soderquist, 2002 , Kolb & Whishaw, 2003).

Thus experience has an important constructive effect. It can create, reinforce or weaken synapses and neural circuits, impacting profoundly on the generation and regeneration of the neural networks which, in turn, construct individuality, choices and tastes. The circuits created are unique, irreplaceable and highly personal. So perceptions represent first of all a subjective phenomenon, and serve as confirmation that nature favors diversity. However, the environment in which we live creates common pathways which determine affinity and the possibility of sharing.

The more experiences and stimuli are abundant and differentiated, the greater seems to be the possibility of developing a balanced personality which can orient itself with equilibrium in the complex world of social relationships and consumption. (Barzanò & Fossi, 2010, p. 4)

The Slow Food Movement, a movement to preserve traditional food production methods also advocates for the indulging in the sensual pleasure of the act of eating. The organization organizes sensorial didactic experiences for children in elementary school in order to teach them to savor food. In this process an appreciation for subtlety increases and the child learns to appreciate where the food came from, how it was grown, and how it can be enjoyed. This experience relates to the three basic principles of Slow Food: good, clean and fair. By eating with a sensual attention to food, an appreciation for subtly is created. This way of eating is also seasonal and therefore increases the diversity of the diet. An appreciation for diverse food offerings can spill into an increased acceptance and tolerance for diversity in other aspects of life (Petrini, 2001).

Tactility

Having an awareness of the skin can be helpful to feel a sense of containment in the body. The skin is the permeable barrier with the external world and is filled with many nerve endings, making it highly sensitive. Touch also informs how a person feels about him or herself. Infants develop and form their first relationships in relationship to caregivers who physically hold them. During that period of time how the caregiver holds the infant informs how s/he feels about him/herself. For example, a secure hold develops feelings of security, while a caregiver who has a loose hold that allows the infant to slide down and needs constant readjustment may develop feelings of insecurity (Tortora, 2006). In this way the corporeal memory creates an imprint in the person who experienced it, shaping how s/he feels about him/herself. These sensations become feelings, often times below the level of consciousness. These body memories, or the body image (collection of beliefs and thoughts about the body) are informed by experience and are slower to change than the body schema or the map of the body contained in the brain.

When utilized with sensitivity to the experience of the person receiving touch, touch can have a powerful impact on the person experiencing it. An awareness to touch can also be accessed through self-touch and touching surfaces and objects, not just between people, empowering the person experiencing the touch to have greater control over the experience. After a person feels safe within their own body, s/he can start to experience touch in a non-threatening way with a trusted individual in small doses. Experiencing something new in the body can start to change the mover's associations with touch and help her to experience a new sensation and build a healthier body image.

Developing the awareness of the boundary of the skin and allowing that to inform the body of the support from the ground, or later on in the practice of CI, from another person can enable the mover to increase awareness of the amount of support given and received as well as the boundaries between the mover and environment or other person. Another aspect Stark Smith uses is the concept of *skinesphere*, which “refers to the movement arena inside the boundary of your skin—that is, sensation of movement and change inside your body” (Koteen & Stark Smith, 2008, p.92). While this definition relates more to interoception than tactile sensation, it is usually initiated by a grounding exercise referred to as “Bonding with the Earth” (Koteen & Stark Smith, 2008, p. 92). This involves yielding to the support of the ground, often starting out in a lying down position, allowing the body to release tension and receive the sensation of support from the floor (Koteen & Stark Smith, 2008). From a psychological perspective, this can provide more internal support for the mover inside the CI duet, allowing the mover to be able to support as well as provide support, without either excess tension, or passively giving weight. This can extend into other areas of life, allowing for the capacity to support oneself and seek support in healthy ways when needed.

Proprioception

Proprioception is the body’s ability to locate itself in space as well as the relationship of some parts of the body to other parts. There is both conscious and unconscious proprioception. Conscious proprioception signifies an awareness of where the body is in space. Unconscious proprioception is the ability of the brain to utilize sensory information to organize movement of the body without conscious decision making. This sensation is made possible by specialized sensory nerves spread throughout the body that record muscle elasticity, tension on the tendons, joint compression, and the position of the head in

relationship to gravity. Sensation is felt after receptors interact with the external environment and send a nerve impulse to a region of the spinal cord or the brain. The somatosensory cortex in the cerebrum maps the entire body and works with the brainstem and cerebellum to maintain a map of the body in space. The cerebellum not only works to map the current position of the body, but also utilizes past information and current information to predict future movement, adjusting posture, movement and tonality of the body to adjust to the new position.

Steve Paxton, the originator of Contact Improvisation experimented with the ability of the body to organize itself based on intentions and reflexes. He developed a way to help people experience the “image-action connection” (Paxton, 2003, p. 176) in CI. He asked people to stand and “imagine, but don’t do it, imagine that you are about to take a step forward with your left foot. What is the difference? As you were. Imagine...(repeat). Imagine that you are about to take a step with your right foot. Your left. Right. Left. Standing” (Paxton, 2003, p.176). People started to smile because they could feel shifts that happened inside their bodies when they imagined that they were about to move in space. Bringing intention to conscious proprioception can be useful not just for understanding how the body organizes, but also how the body feels. Fascia, or the connective tissue structure that is constantly regenerating and shaping itself according to use, contains a high concentration of sensory nerve endings, especially mechanoreceptors and nociceptors, making it “our most important organ for proprioception and for our ‘sense of embodiment’” (Schleip, 2009, p. vi). An awareness of pain or discomfort can be clinically helpful for patients who self-medicate as it allows them to become more aware of their actions and subsequently to make healthier choices.

Clinical Implications for the Development of Multisensory Awareness

The senses inform the individual of current physical and emotional feelings and sensations, both internal and external. Developing sensory awareness enables the individual to gain better self awareness of sensations. From this awareness the individual has choices about how to respond to a sensation. Without the awareness, patterns are repeated that may not serve an individual well in life. For example, patients who abuse substances frequently are responding to undesired feelings or sensations either within themselves or in the environment. Feelings of emotional hurt, physical pain, or withdrawal and/or craving sensations can trigger the individual with a history of substance use to use a drug to escape these uncomfortable feelings. When an individual seeks treatment for substance abuse, that individual is faced with having to feel whatever was masked or escaped in the past and to learn new ways of coping with that feeling. At times, when there is a long history of abuse, an individual is not even aware of sensations and cannot imagine alternatives to using drugs. Increasing sensory awareness empowers the individual to be able to name a sensation, feel it, and choose how to cope with it.

This process parallels the mover's experience in Authentic Movement. As the mover develops an inner witness in the presence of an external witness, consciousness is gained (Adler, 2007). Mary Whitehouse considered body awareness as the initial phase of Authentic Movement:

The kinesthetic sense can be awakened and developed in using any and all kinds of movement, but I believe it becomes *conscious* only when the inner—that is the subjective—connection is found, the sensation of what it feels like to the individual,

whether it is swinging, stretching, bending, turning, twisting, or whatever.

(Whitehouse, 1958, p.46)

Teaching patients who abuse substances to learn to witness the experience within their own bodies and of their external environment allows for more options and new ways of coping with sensation. Patients learn to recognize what they can and cannot control and learn ways of coping that utilizes non-judgmental witnessing of the internal and external sensory experience.

Becoming more aware of sensations can lead to becoming more aware of emotions. When a client is asked to draw attention to a particular sensation and start to verbalize how it feels, the client can start to assign meaning to. Additionally, once attention is drawn to a sensation such as muscle tension, the client experiencing it can start to develop a healthy way to cope and possibly ameliorate the sensation of tension through breathing or gentle movement. This is especially important for patients who abuse substances, as it allows them to start to tolerate emotions that are difficult to cope with that would have led to them using their substance of choice in another environment. This is also relevant for patients with other psychiatric or neurotic issues such as depression and anxiety. Patients with depression often feel heavy and experience generalized pain as symptoms. When a patient experiencing depression is given the opportunity to sense and then empowered to utilize breath or movement to ameliorate the pain, the client can reduce tension, sending signals through the nervous system to reduce tension, release higher levels of serotonin and providing experiential memory, creating a shift in the body schema as a new possibility is discovered. Patients with anxiety can learn how to cope with the sensations of hyper arousal by learning to start to calm the nervous system with oxygenation from deep-breathing when sensations of

arousal are noticed. Before a client with anxiety can start to initiate change, the client must learn to recognize what the sensations feel like so that when a situation triggers the sensation the individual is enabled to respond.

Hindi describes the process that she proposes for integrating attention to interoception to DMT:

There is reason to believe that informed attention to interoception may correlate with increased self-awareness and emotional regulation through both embodied and conceptual channels. Based on these assertions, dance/movement therapists could incorporate attention to interoception as a first step in preparing clients to work through personal challenges. Specific interventions for this purpose would involve a sequence of five tasks: (1) establishing curiosity, (2) identifying and tracking physical sensations, (3) translating into communicable language, (4) recognizing patterns, and (5) exercising new awareness. While these five tasks would employ a myriad of physiological and psychological processes and would not isolate a particular brain structure or particular function, the hope is that the five tasks would sequentially engage attention to interoception, mirroring the neural biological process of interoception. (Hindi, 2012, p. 136-137)

In this way, the process of increasing and acting upon sensory awareness engages bottom-up processing, allowing what is sensed in the environment to be cognitively processed and utilized to change the schema of the individual perceiving the sensation. Once there is schematic change, this sensory awareness can influence top-down processing, acting upon newly formed awareness to create new possibilities for behavior in similar environments. Utilizing an improvisatory approach to sensory awareness building allows the mover to

initiate the construction of cognition, on a body schematic level, as new experiences form new possibilities, as well as on a cognitive level, engaging higher order cognitive processing as the mover initiates a verbalization process on what was experienced.

Psychiatric Disorders

Attention to sensation is not only helpful for just substance use disorders as previously mentioned, but it can aid in the treatment of patients with psychiatric diagnoses. By utilizing the body and verbalization of what the body is experiencing, the psychiatric patient is able to organize and integrate material from the present “here and now” experience to increase sensory awareness and a more realistic understanding of the body and the environment. The patient with schizophrenia often has a faulty perception of boundaries, merging another person’s boundaries with their own. The process of increasing sensory awareness allows the patient with schizophrenia to start to differentiate the body from the environment, much in the same way as an infant forms a body image, through self-exploration and stimulation of various body parts. Directed exploration of interoception through the breath as well as increasing the tactile experience of the patient through self-touch allows the patient with schizophrenia to differentiate from the environment, forming a body boundary and therefore initiating the process of differentiation. This is particularly important for patients experiencing paranoid or persecutory delusions as the patient had been experiencing an “invasion of the body boundaries (i.e., being followed, poisoned food, being spied on, feelings of other “beings” inside the body)” (Capello, 2009, p. 81).

Geriatric Patients

Inherent in the process of aging is a decrease in sensory perception. By offering opportunities to stimulate sensory experience, geriatric patients are engaged in a process that

promotes increased self-esteem, as opportunities to prevent loss (of mobility, memory, sensory perception) and reconcile it with reality. Stimulation of kinesthetic memory can initiate the process of reminiscence and therefore cognitive reorganization, as physical movement stimulates recall of previous similar experiences (Sandel & Scott Hollander, 1995).

Early Childhood

As previously discussed, sensory experience is integral in the formation of self-concept, a process which happens in relationship to caregivers. When a child has the experience of being raised in an environment that is somewhat impaired due to either physical illness of the child or mental illness or emotional disturbance of the caregiver, it affects the social and emotional development of the child. When the child is given the opportunity to interact with a healthy adult, or engaged in more sensorial rich environment, the child can develop a healthier body concept. The therapist can work directly with the child as well as engage the caregiver in the therapeutic process, creating an opportunity to repair attunement miss-matching. Tortora (2009) developed a unique way of working that incorporates self observation of the therapist while observing children. This process is inspired by Authentic Movement practice and incorporates witnessing, or “mapping the details of the mover’s actions” (Tortora, 2009, p. 163), awareness and reflection of the witness/therapist’s sensorial reactions, “kinesthetic seeing,” (Tortora, 2009, p.163) and awareness and reflection of emotional experience when witnessing, including physically “trying on” (Tortora, 2009, p. 163) the actions of the mover to kinesthetically empathize. This process allows the therapist to understand the child’s relationship to the world and then respond with an appropriate intervention that address the emotional and sensorial need of the

child. Additionally, observation of the caretaker with the child allows the therapist to interact with the dyad to form relationships where the child feels met, or attuned to. When working with infant and very-early childhood, touch is vital in this process, because how the infant experiences being met when held, affects how s/he feels.

Eating Disorders

People diagnosed with eating disorders experience impairment in the relationship between their body image and body schema. Similar to the experience of people who abuse substances, the person with an eating disorder attempts to numb or control feelings in an unhealthy way. This is augmented by obsessive worry, rigid thinking, and fixation on a distorted image of the body resulting from this attempt to control or numb feelings (Kleinman, 2009). A focus on interoception, proprioception, and tactile sensation can assist the individual with an eating disorder to start to become more aware of the internal feeling state of the body, allowing the individual to develop more realistic body image. In this process, focusing on the felt state of the body, gradually introduced improvisational exploration allows the individual to expand creativity, thereby relaxing the fixated body construct which previously included codified exercise movement. Self-touch and grounding exercises such as the aforementioned “Bonding to the Earth” exercise can allow the individual with an eating disorder to become more in contact with the physical body and its relationship to the Earth, promoting experiencing life over the rigid patterns and behaviors previously experienced. Additionally, pleasure is not a valued experience for the rigid person with an eating disorder. A complementary treatment to the nutritional therapy that patients with eating disorders receive while in treatment, the Dance/Movement Therapist can help facilitate the re-structuring of the patient’s relationship to food through awareness

building of olfaction and taste. Asking the patient to take in the smell of a food and describe how it makes them feel and allowing all aspects of taste to be consciously experienced, allows the individual with an eating disorder to bring conscious awareness to the act of eating and increase pleasure. Increasing pleasurable experiences with food is important, as the individual with an eating disorder has developed restrictions and de-emphasized taste and pleasure over control in relationship to food.

Conclusions

As I stand in the middle of the room full of dancers, I feel my weight shift inside my body, little twitches in my thighs, as the muscles adjust to maintain balance as I breath in and out. I feel my feet widening into the floor, allowing me to feel more connected to the Earth; I am more balanced, more ready to make contact as I feel more grounded and centered. My gaze shifts upward and I see the dancer I will dance with moving in a spiraling manner, gradually shifting her weight as she spirals around herself. I also start to mobilize my body. I relate to her movement, but don't allow myself to fixate on what she does, just allowing momentary glimpses to sink into my eyes. I allow my body to tilt in a direction and respond by rotating my body to shift into the direction of movement or reach out in space to make contact with the floor with my hand, allowing my new relationship to gravity to excite and surprise me as I start to allow momentum to take over and allow myself to become slightly disoriented. I feel my back touch my partner. We are in contact. We move in spirals around each other, moving from proximal contact to distal contact and back again. I allow myself to give more and more weight as I start to become more familiar with my partner's movement, and there is a mutual increase of weight sharing. My partner bends forward, knees bent. In an instant I slide my arm diagonally across her back and reach out my legs in

opposition to my arms; I am momentarily suspended in the air. I feel the point of shared weight shift within my body from my pelvis to my shoulder. I shift back in the other direction by lowering my leg. I move away from my partner. I feel content; I do not feel a need to remain in contact. I feel satisfied by the encounter and continue to explore momentum and the shift of weight inside my body. We make contact again. This time our speed has increased. I find myself in the air more frequently as well as supporting my partner. We connect and separate, connect and separate, ending our duet as two individuals related in space, facing opposite directions.

This ability to feel content in relationship as I approached and separated from my partner has developed over time. As I trusted myself more, and trusted my partner more, I allowed myself to give and receive more weight. I allowed myself to surrender control over the direction of my body at times when there was support from my partner and the floor, while also regaining control at times, adding tone when I briefly saw myself approaching an obstacle such as the piano in the room, as well as when I came to a place where I could support my partner with my body. This relationship was satisfying as I was able to utilize the sensation of touch, proprioception, and sight to orient myself and relate, while allowing myself to relax my need for control and orientation in my vestibular system.

References

- Adler, J. (2007). From Autism to the Discipline of Authentic Movement. In P. Pallaro (Ed.), *Authentic Movement: Moving the Body, Moving the Self, Being Moved* (pp. 24-31). Philadelphia, Pennsylvania: Jessica Kingsley Publishers.
- Barzanò, C., & Fossi, M. (2010). *In What Sense: A short guide to sensory education*. Retrieved from Slow Food Web site: <http://slowfood.com/filemanager/Education/InWhatSense.pdf>
- Blackwood, M. (Director). (2002). *Butoh: body on the edge of crisis* [Motion Picture].
- Bragulat, V., Dzemidzic, M., Bruno, C., Cox, C. A., Talavage, T., Considine, R. V. and Kareken, D. A. (2010), Food-Related Odor Probes of Brain Reward Circuits During Hunger: A Pilot fMRI Study. *Obesity*, 18: 1566–1571. doi: 10.1038/oby.2010.57
- Brodie, J. A., & Lobel, E. E. (2008). More Than Just a Mirror Image: The Visual System and other Modes of Learning. *Journal of Dance Education*, 8(1), pp. 23-31.
- Buckwalter, M. (2010). *Composing while dancing: An improviser's companion*. Madison, Wisconsin: University of Wisconsin Press.
- Capello, P. P. (2009). BASCICS: An Intra/Interactional Model of DMT with the Adult Psychiatric Patient. In S. Chaiklin, & H. Wengrower (Eds.), *The Art and Science of Dance/Movement Therapy: Life is Dance* (pp. 77-102). New York: Routledge.
- Cohen, B. B. (2012). *Sensing, Feeling, and Action: The Experimental Anatomy of Body-Mind Centering* (3rd ed.). Northampton, Massachusetts: Contact Editions.
- Corbet, D. (1999). Katie Duck: an interview. <Proximity>, 2. Retrieved March 5, 2015, from http://proximity.slightly.net/archive-old/v_two/v2e4a2.htm

- Cozolino, L. (2010). *The neuroscience of psychotherapy: Healing the social brain*. New York: W. W. Norton & Company.
- Craig, A. D. (2002). Opinion: How do you feel? Interoception: the sense of the physiological condition of the body. *Nature Reviews Neuroscience*, 3(8), 655-666.
doi:10.1038/nrn894
- Dilley, B. (2005). Two Streams: Many Ways. *Contact Quarterly*, 29(2), 39-41.
- Eliot, L. (1999). *What's Going On in There?* New York: Bantam Books.
- Essick, G. K., & Trulsson, M. (2009). Tactile Sensation in Oral Region. In M. D. Binder, N. Hirokawa, & U. Windhorst (Eds.), *Encyclopedia of Neuroscience* (pp. 3999-4005). Berlin, Germany: Springer Berlin Heidelberg. doi:10.1007/978-3-540-29678-2_5872
- De Spain, K. (2014). *Landscape of the now: A topography of movement improvisation*. New York: Oxford University Press.
- Haber, SN. (2011). Neuroanatomy of Reward: A View from the Ventral Striatum. In JA. Gottfried (Ed.). *Neurobiology of Sensation and Reward*. (Chapter 11) Boca Raton, FL: CRC Press. Available from: <http://www.ncbi.nlm.nih.gov/books/NBK92777/>
- He, M., Tian, H., Luo, X., Qi, X., & Chen, X. (2015). Molecular Progress in Research on Fruit Astringency. *Molecules*, 20(1), 1434-1451. doi:10.3390/molecules20011434
- Hindi, F. (2012). How Attention to Interoception Can Inform Dance/. *American Journal of Dance Therapy*, 34, 129-140.
- Jensen, E. P. (2000). *Music With the Brain in Mind*. San Diego: The Brain Store, Inc.
- Kolb, B., & Whishaw, I. (2003). *Fundamentals of Human Neuropsychology* (5th ed.). New York: Worth Publishers.

- Kleinman, S. (2009). *Becoming Whole Again: Dance/Movement Therapy for Those Who Suffer from Eating Disorders*. In S. Chaiklin, & H. Wengrower (Eds.), *The Art and Science of Dance/Movement Therapy* (pp. 125-143). New York: Routledge.
- Koteen, D., & Stark Smith, N. (2008). *Caught falling: The confluence of contact improvisation, Nancy Stark Smith, and other moving ideas*. Holyoke, MA: Marcus Printing.
- Laska, M., Genzel, D., & Wieser, A. (2005). The Number of Functional Olfactory Receptor Genes and the Relative Size of Olfactory Brain Structures Are Poor Predictors of Olfactory Discrimination Performance with Enantiomers. *Chemical Senses*, 30(2), 171-175.
- Martin, G. N. (2013). *The Neuropsychology of Smell and Taste*. East Sussex: Psychology Press.
- Martin, N. (2007). Ensemble Thinking: Compositional Strategies for Group Improvisation. *Contact Quarterly*, 32 (2), 10-15.
- Paxton, S. (1975). Contact Improvisation. *The Drama Review*, 19(1), 40-42.
- Paxton, S. (1986). The Small Dance, The Stand. *Contact Quarterly*, 11(1), 136.
- Paxton, S. (2003). Drafting Interior Techniques. In A. C. Albright, & G. David (Eds.), *Taken by Surprise: A Dance Improvisation Reader* (pp. 175-183). Middletown, Connecticut: Wesleyan University Press.
- Petrini, C. (2001). *Slow Food: The case for taste*. New York: Columbia University Press.
- Quackenbush, T. (1997). *Relearning to See: Improve Your Eyesight—Naturally!* Berkeley: Frog, Ltd.

- Sandel, S. L., & Scott Hollander, A. (1995). Dance/Movement Therapy with Aging Populations. In F. J. Levy, J. Pines Fried, & F. Leventhal (Eds.), *Dance and Other Expressive Art Therapies: When Words are Not Enough* (pp. 133-143). New York: Routledge.
- Schleip, R. (2009). Forward. In L. Stecco, & C. Stecco, *Fascial Manipulation: Practical Part* (pp. v-vii). Padova, Italy: Piccin Nuova Libreria S.p.A.
- Soderquist, D. R. (2002). *Sensory Processes*. Thousand Oaks, California: Sage Publications.
- Stromsted, T., & Haze, N. (2007). The Road I: Elements of the Study and Practice of Authentic Movement. In P. Pallaro (Ed.), *Authentic movement: Moving the Body, Moving the Self, Being Moved* (Vol. II, pp. 56-68). Philadelphia: Jessica Kingsley Publishers.
- Tortora, S. (2006). *The Dancing Dialogue: Using the Communicative Power of Movement with Young Children*. Baltimore, Maryland: Paul H. Brookes Publishing Co.
- Tortora, S. (2009). Dance/Movement Psychotherapy in Early Childhood Treatment. In S. Chaiklin, & H. Wengrower (Eds.), *The Art and Science of Dance/Movement Therapy: Life is Dance* (pp. 159-180). New York: Routledge.
- Whitehouse, M. S. (1979). C.G. Jung and Dance Therapy: Two Major Principles. In P. Pallaro (Ed.) (1999), *Authentic movement: Essays by Mary Starks Whitehouse, Janet Adler and Joan Chodorow* (Vol. I, pp. 73-101). Philadelphia: Jessica Kingsley Publishers.
- Whitehouse, M. S. (1958). The tao of the body. In P. Pallaro (Ed.) (1999), *Authentic movement: Essays by Mary Starks Whitehouse, Janet Adler and Joan Chodorow* (Vol. I, pp. 41-50). Philadelphia: Jessica Kingsley Publishers.

Zajonc, A. (2009). *Meditation as Contemplative Inquiry: When knowing becomes love*. Great Barrington, Massachusetts: Lindisfarne Books.