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Dance Movement Therapy and Sensory Integration:

An Integrated Approach to Working With Children

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by

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Dedication

To my wonderful new husband who told me I didn't have to write this thesis, which is the same way he got me to fall in love with him. Thank you.

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Unending thanks to Emily Sellergren, a true friend who helped me when I didn't want help, and did so with a loving heart and an open calendar.

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Abstract

Title: Dance Movement Therapy and Sensory Integration: An integrated approach to working with children

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This thesis addresses a therapeutic approach to working with children in dance movement therapy settings. During these sessions, the dance therapists were asked to incorporate sensory integration techniques within dance therapy sessions. The research question asked: how does increased awareness and utilization of occupational therapy-based interventions with elementary aged children exhibiting possible sensory integration symptoms effect dance therapists reported effectiveness of dance therapy sessions?

The author of this thesis created a manual to be utilized by a dance therapist in her sessions with elementary aged children who display symptoms of sensory integration disorder. The dance therapist was asked to apply movement interventions designed to address both sensory integration issues and body-based psychotherapy concerns. The subject filled out a pre-study questionnaire and journalled after each session. Her post-study interview was tape recorded and analyzed afterward to find general themes of her reported experience working with the manual.

The results of this case study indicated that utilizing sensory integration techniques in conjunction with dance therapy can facilitate beneficial changes in behavior, which in turn can support accomplishment of therapeutic goals.

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Introduction

Personal Statement

Children have found their own precious ways from vulnerable, helpless infants to effective, functioning adults with amazing regularity since we first started the process of aging millions of years ago. For each individual person this metamorphosis is typically both miraculous and ancient. Each child actively seeks and chooses activities which provide the fullest, most complete growth and development possible within his or her own internal and external environments. Each new experience deposits new information in his or her broadening understanding of the world, and thus affects the beliefs about his or her relationship to it. I have always enjoyed watching children learn about their world, and I respect their creative choices about how they choose to do so.

For one year I worked with elementary aged children in a day treatment program. The children in this program generally had very painful and difficult histories. Many of them experienced some type of emotional or physical abuse, had alcoholic caretakers, and many have been in foster placements. All were open cases with Social Services, Boulder County Mental Health, and were identified as having special educational needs within the school system. The environment from which most of these children came typically did not offer experiences encouraging healthy emotional development. In many it was impeded. Life was made even more difficult for some of these children due to a specific type of neurological difficulty called sensory integration disorder.

One day I accompanied some of the children into their occupational therapy session specifically addressing their sensory integration problems. I was intrigued to find that their occupational therapist encouraged them to do exercises which were similar to

interventions some dance movement therapists might encourage **their** clients to try. The main difference between the occupational therapy and dance therapy interventions was that the occupational therapy was mainly working from a physiological perspective while a dance therapist works more from a psychological viewpoint. While the two therapies have different areas of expertise, they both seem to be positively affecting both the emotional and physical health and integration of their clients. The same occupational therapist gave a presentation to our day treatment team about sensory integration disorder, how to recognize it, and which exercises promote particular emotional/sensory states. I suddenly saw these children in a whole new light, and began to recognize how the children's sensory integration issues could manifest themselves in ways that look like psychological and behavior dysfunction. It seems that some of the children's symptoms probably contributed to their placement into Day Treatment in the first place. This inspired me to begin educating myself about the disorder and the interventions occupational therapists utilize with children who have sensory integration disorder.

Statement of the Problem

During my initial investigations I found that occupational therapy had explained and quantified reasons that particular movement interventions were of value. While much of the literature I had read of dance therapy often explained reasons for why a particular movement is of value emotionally, I had not seen any quantification as to what they did physiologically to illicit valuable emotional states. Occupational therapy literature did note that sensory integration difficulties could result in behavior problems with children, and that occupational therapy could increase their sense of self-esteem. It did not

mention, however, much about the developmental nature of the movements, or their emotional underpinnings.

Both occupational therapy and dance therapy seem to be tackling similar problems, and coming up with similar movement-based solutions to them. They each have their own abundance of knowledge, yet neither as yet have looked to each other to support and augment each other's field of expertise. I feel that both fields of therapy could benefit from a cross pollination of information between the two. Coming from a dance therapy background, I feel dance therapy could especially use pieces of occupational therapy's expertise to integrate an outside perspective validating its own theories, as well as expanding them.

Purpose of Study

As I cannot push the dance therapy model onto the field of occupational therapy about how it should adopt aspects of dance therapy, I will instead try to discover if adoption of some of occupational therapy's field of knowledge aids the practice of dance therapy. My hope is that occupational therapy will be able to contribute to dance therapy knowledge and expertise about the physiological results of some interventions with sensory integration children, as well as enhance sensory integration challenged children's ability to integrate dance therapy sessions.

This manual is intended to educate and encourage dance therapists to recognize sensory integration issues and to consciously choose interventions naturally addressing both their clients' psychological and sensory integration symptoms. The hope is that when dance therapists can address their clients' sensory integration symptoms, their

clients may be more receptive to the dance therapy process, and will present fewer emotional and behavior problems. A more rounded, multi-modal approach to working with our dance therapy/sensory integration clients will hopefully allow them to become increasingly able to process sensory stimuli, and thus better able to process psychological issues though dance therapy.

Research Question

How does increased awareness and utilization of occupational therapy-based interventions with elementary aged children exhibiting possible sensory integration symptoms via a manual effect dance therapists reported effectiveness of dance therapy sessions?

Operational Definitions

Adaptive Response. An appropriate action in which the individual responds successfully to some environmental demand. They require good sensory integration, and they also further the sensory integrative process.

Apraxia. The lack or praxis or motor planning. In children, a sensory integrative dysfunction that interferes with planning and performing an unfamiliar task (Ayers, 1979).

Body Image. The perception of one's own body. This consists of sensory pictures, or "maps". May also be called body percept, or body scheme (Ayers, 1979).

Dance Therapy. American Dance Therapy Association (1974) defines dance movement therapy as the psychotherapeutic use of movement as a process which furthers the emotional, physical and social integration of the individual.

Dyspraxia. Poor praxis or motor planning. A less severe, but more common dysfunction than apraxia.

Lateralization. The propensity for particular neural processes to be executed most effectively in a particular cerebral hemisphere. Generally, the right hemisphere is more efficient in processing spatial patterns, while the left hemisphere specializes in verbal and logical processes (Ayers, 1979).

Learning Disorder. Diagnosed when a child's reading, mathematical, or writing skills are substantially below that expected of age, schooling, and level of intelligence. This disorder should not be attributed to impaired sight or hearing, mental retardation, or lack of learning opportunities (Ayers, 1979).

Locomotion. Movement of the body through space (Ayers, 1979).

Modulation. The brain's regulation of its own activity. Modulation involves facilitating some neural messages to produce more of a perception or response, and inhibiting other messages to reduce excess or extraneous activity.

Motor Planning. The ability of the brain to conceive of, organize, and carry out a sequence of unfamiliar actions. Also known as praxis.

Occupational Therapy. A health and rehabilitation profession that helps people regain, develop, and build skills that are important for independent functioning, health, well-being, security, and happiness. Occupational therapy practitioners work with people

of all ages who, because of illness, injury, or developmental or psychological impairment, need specialized assistance in learning skills to enable them to lead independent, productive, and satisfying lives (The American Occupational Therapy Association, 2002).

Proprioception. From the Latin word for "one's own." The sensations from the muscles and joints. Proprioceptive input tells the brain when and how the muscles are contracting or stretching, and when and how the joints are bending, extending, or being pulled or compressed. This information enables the brain to know where each part of the body is and how it is moving.

Sensory Input. The streams of electrical impulses flowing from the sense receptors in the body to the spinal cord and brain.

Sensory Integration. The organization of sensory input for use. Uses may be: perceptions of the body or environment, adaptive responses, learning processes, or the development of particular neural functions. With efficient sensory integration, all aspects of the nervous system cooperate so people can interact with their environment effectively and experience appropriate satisfaction (Ayers, 1979).

Sensory Integrative Therapy. Treatment involving sensory stimulation and adaptive responses to it according to the child's neurological needs. Therapy usually involves full body movements that provide vestibular, proprioceptive, and tactile stimulation. The goal is to improve the way the brain processes and organizes sensations.

Tactile. Pertaining to the sense of touch on the skin.

Vestibular System. The sensory system that responds to the position of the head in relation to gravity and accelerated or decelerated movement.

Research Methodology

A qualitative case study of one dance therapist examined her perception of the effectiveness of a manual written for dance therapists about sensory integration disorder, some possible indicators of it, and some movement interventions intended to facilitate the neurological as well as emotional and physical integration of elementary aged children. The therapist implemented the manual's movement interventions with two different clients, twice each. Assessment of the case study included a pre-study questionnaire and post-session journaling. Finally a recorded, qualitative post-study interview was completed, including protocol questions as well as emergent questions following the content of the interview.

Limitations

One limitation of this study is that there is very little literature or studies on this topic. Thus this study will be a very early attempt at exploring this subject. This study was case study with only one subject, which does not allow for any generalization about the larger population of dance therapists. This therapist utilized the manual and it's movement interventions with two clients in two individual sessions over a couple of days. This time span does not allow a clear understanding of the effects of these interventions over time (occupational therapy would generally recommend treatment once a week over

at least six to twelve months). Another limitation may be that the researcher is not a trained or experienced interviewer.

Review of Literature

Sensory Integration

The term "sensory integration" refers to both a neurological process and a theory of the relationship between behavior, academic performance and neural functioning (in particular sensory processing or integration). The term sensory integration disorder does not refer to only one type of problem. It is more indicative of a group of disorders that are often interrelated. These groups include sensory modulation problems, sensory registration problems, sensory defensiveness (tactile, gravitational, auditory, visual, gustatory, and olfactory), sensory discrimination and perception problems, tactile discrimination and perception problems, proprioception problems, visual perceptual problems, vestibular processing disorders, and dyspraxia. All of these problems exist on a continuum and are not necessarily mutually exclusive.

People often have related problems in a variety of areas including psychosocial, motor, and learning skills (Fisher, Murray & Bundy, 1991). A. Jean Ayers, who developed the theory, originally defined the sensory integration process as " the ability to organize sensory information for use" (Ayres, 1972b, p.1). After much more research and publications she elaborated her definition as such:

> Sensory integration is the neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment. The spatial and temporal aspects of inputs from different sensory modalities are interpreted, associated, and unified. Sensory integration is information processing... The brain must select, enhance, inhibit, compare, and

> associate the sensory information in a flexible, constantly changing pattern; in other words, the brain must integrate it (Ayres, 1989, p. 11).

Occupational therapists hold two broad goals for the children they work with, "to improve the child's functional performance and to enhance the child's ability to interact within his or her physical and social environments (Case-Smith, Allen, and Pratt, 1996, p.4). They observe children's performance in areas of their lives such as self-care, play, school, and work activities. According to Gilfoyle, Grady, and Moore (1990), to successfully adapt to the environment, a child must assimilate sensory information and accommodate to it with a motor response. Movement is the first way that a child interacts with their environment, and motor skills evolve as a direct response to sensory input from that environment.

History

A. Jean Ayers, an occupational therapist, began looking at the field of sensory integration in the late 1960's and early 1970's. She claimed that the body-centered, proximal senses are foundations on which more complex applications are built. The proximal senses include the vestibular, tactile, and proprioceptive senses. These senses are primary and primitive, and they encompass nearly every interaction with the world early in life. While the distal senses of vision and hearing are critical, and become increasingly dominant over time, Ayres believed that the body-centered senses are a foundation on which complex occupations are built. This was a fairly new concept because the proximal senses were nearly ignored by scholars and clinicians interested in child development (Parham & Mailloux, 1996).

Ayres wanted to describe and predict these relationships between the central nervous system (CNS) and the environment, and to identify particular subtypes or patterns of sensory integration dysfunction in children with sensorimotor or learning problems. She felt the need to identify and explain the causes of these problems specifically in order to find the best mode of treatment for them (Fisher, Murray & Bundy, 1991).

The theory of sensory integration is strongly rooted in neuroscience, as Ayres did her postdoctoral work at the Brain Research Institute of the University of California. Her work with children with cerebral palsy, and later observations of learning disabled children, inspired her to explore the perceptual and motor roles in learning. In order to diagnose a child with Sensory Integration Disorder, Ayres developed highly structured, test-like, observations. These typically involve a set of specific tasks, reflexes, and signs of nervous system integrity associated with sensory integration functioning. These include the Southern California Sensory Integration Tests (Ayers, 1972c, 1980) (which measure visual, tactile, and kinesthetic perception, as well as perceptual-motor function), as well as others which measure vestibular function (Ayres, 1975b). In her assessment of clients and subjects, Ayres also observed and noted neuromotor maturation, such as muscle tone, balance, and the ability to extend or flex the body against gravity (prone extension and supine flexion) (Fischer, Murray & Bundy, 1991). These tests were later revised and standardized to better delineate the sensory integration and related deficits in children with learning or behavioral problems. This new battery of tests is called the Sensory Integration and Praxis Tests (SIPT) (Ayres, 1989). Despite the use of many standardized tests, the motor functions being measured are often strongly affected by

conditions and circumstances other than sensory integration issues, and occupational therapists must be well trained to account for any possible differential diagnosis.

Sensory integration theory has three important postulates. First, normally functioning individuals naturally take in sensory information from their environment and from their own bodies. Their central nervous systems process and integrate the information and use it to plan and organize their behavior. Second, abnormalities in integrating sensory inputs result in conceptual and motor learning difficulties. Third, sensory integration can be enhanced by providing sensory experiences in the context of a meaningful activity, and by the planning and production of an adaptive behavior. Moreover, improvements in sensory integration can enhance learning (Fischer, Murray & Bundy, 1991).

Neurobiologically Based Concepts

The neural and behavioral aspects of sensory integration theory are supported by a number of neurobiologically based concepts and assumptions.

Developmental Sequence. The sensory integration process is assumed to occur in a developmental sequence. In typical development, early development of simple behaviors enables increasingly complex behaviors in later development. Behaviors present at each developmental stage serve to enable even more complex behaviors later. Ayres called this a circular process of sensory integration (Figure 1-1).

> Sensory integration theory assumes that the brain is immature at birth and also is immature [or dysfunctional] in some individuals with learning problems. Treatment for these individuals is aimed at recapitulating normal neuromotor development by

> providing therapeutic sensory and motor experiences. The goal of sensory integration therapy is to provide stimulation that will address certain brain levels (primarily subcortical), enabling them to mature [or function more normally], and thereby assisting the brain to work as an integrated whole (Short-DeGraff, 1988, p. 200).

This concept is mirrored by Bonnie Bainbridge Cohen's Body Mind Centering work, which is further discussed in the Dance Therapy section of the review of literature.

Central Nervous System Organization. Ayres (1972b) believed that critical aspects of sensory integration are seated in the lower levels of the CNS, particularly in the brainstem and thalamus. Most of our vestibular information processing takes place in the brainstem, and somatosensory processing takes place there and in the thalamus. A basic tenet of Ayres's theory is that because of the dependence of higher CNS structures on lower ones, increased efficiency at the levels of the brainstem and thalamus enhance higher-order functioning (Ayres, 1972b).

Ayres' also assumed that the CNS develops hierarchically from bottom to top, with spinal and brainstem structures maturing before higher-level centers. This view was recently proved correct by PET research (Chugani & Phelps, 1986). The hierarchic approach to CNS functioning and development influenced Ayres to emphasize the more "primitive" vestibular and somatosensory systems in her work with young children. As these systems mature early and are housed in the lower CNS centers, Ayres reasoned that the refinement of primitive functions such as postural control, balance, and tactile perception provides a sensorimotor foundation for higher-order functions like academic ability, behavioral self-regulation, and complex motor skills like those required in sports.

Parham and Mailloux (1996) explained that Ayres viewed the developmental process as one in which

> primitive body-centered functions serve as building blocks on which complex cognitive and social skills can be scaffolded. This view undergirds a basic premise of the therapy approach that she developed: that by enhancing lower-level functions related to the proximal senses, one might have a positive influence on higher-level functions (Parham & Mailloux, 1996).

Sensory integration theory has been criticized because of its inclusion of hierarchical concepts (Ottenbacher & Short, 1985; Short-DeGraff, 1988). While Ayres initially used these concepts to aid in the communication of the theory and to guide treatment, it lead to some overemphasizing linear thinking when describing SI theory and practice. Greater emphasis has since been placed on a systems view of the nervous system. As recognized by Pribram (1996), "the essence of biological... hierarchies is that higher levels of organization take control over, as well as being controlled by lower levels. Such reciprocal causation exists throughout brain structures (Pribram, 1996, p. 507). Fisher, Murray & Bundy recommend that children with SI processing problems be viewed as having one or more systems not functioning optimally. This view recognizes that systems interact, and that both cortical and subcortical structures contribute to sensory integration. It also recognizes that both the person and the nervous system are open systems which are organized into a coherent whole, capable of self-regulating, self-organizing, and changing itself through the circular process shown in Figure 1-1. In this circular process, the action of the system (adaptive behavior, output, or interaction with the environment)

becomes the cause (feedback and intake) of system change (Fisher, Murray & Bundy, 1991).

Adaptive Response. Children naturally and actively select sensations most useful for a given activity, and which facilitate the accomplishment of their goals. Having successfully accomplished their goal, children can repeat the organized action and build on it for the next challenge. That is called an adaptive response. It is a purposeful, goal-directed response to sensory experience. Adaptive responses are possible because the brain has efficiently organized incoming sensory information, which then provides a basis for action.

As new and more complex movements are learned, new forms of feedback are produced. We learn movements from past experience only if we recognize that the prior movements were successful according to physical sensations. These sensations are organized in the brain, and provide the memories of " how it feels" to move. When compared to memories of "what is achieved," an individual can use that experience to plan more complex movements. "Learning from previous experience thus depends on sensing and moving, not just on sensing" (Brooks, 1986, p. 14).

Adaptive responses help children drive their own development. Each time a more complex response is executed the brain attains a more organized state, and thus it's capacity for more efficient sensory integration is increased. Efficient sensory processing leads to adaptive responses, which result in more efficient sensory integration. One example of this is learning to ride a bicycle. Senses must quickly and accurately register when the child begins to fall. After enough practice, the child integrates sensory information efficiently enough to make the appropriate shifts of weight over the bike

when needed to maintain balance. Once a successful, adaptive response is made, the child is more able to repeat it on subsequent attempts. The child's nervous system changes to make each subsequent bike riding session less effort.

Making active responses requires the child to be an active "doer", not a passive recipient. While no child can be forced to respond adaptively, situations can be set up to elicit a desired response, which once performed will be recognized by the child's nervous system as adaptive. For typically developing children, and even for many with disabilities, there is an innate drive to develop sensory integration through adaptive responses. Ayres (1979) called this inner drive. She designed therapeutic activities and environments to engage the child's inner drive, elicit adaptive responses, and in doing so, advance their sensory integration development.

Neural Plasticity. When a child makes an adaptive response, a change is thought to have been made at a neuronal synaptic level. This is a function of the brain's plasticity. Plasticity is the ability of a structure and it's function to be changed gradually by its own ongoing activity (Ayres, 1972b). It is well established that when organisms are permitted to explore interesting environments, significant increases in dendritic branching, synaptic connections, synaptic efficiency, and even size of brain tissue result (Rosenzweig, Bennett, & Diamond, 1972). These changes are most dramatic in the young. Ayers (1989) believed,

> The brain, especially the young brain, is naturally malleable; structure and function become more firm and set with age. The formative capacity allows person-environment interaction to promote and enhance neurointegration efficiency. A deficiency in the individual's ability to engage effectively in this transaction at critical

> periods interferes with optimal brain development and consequent overall ability. Identifying the deficient areas at a young age and addressing them therapeutically can enhance the individual's opportunity for normal development (Ayres, 1989, p. 12).

It seems that somehow, adaptive response stimulates the brain's neuroplastic capabilities. Furthermore, the brain's plasticity makes it possible for an adaptive response to increase the efficiency of sensory integration on a neuronal level. Returning to the bike-riding example, once the child has practiced long enough on flat straight terrain to solidify the necessary neural pathways, they are again challenged to accommodate curbs, hills, and turns.

Fisher, Murray, and Bundy were careful to point out, however, that there is a difference between neural plasticity and behavioral change. Changes in behavior do not necessarily mean a change in neural structure.

Inner Drive. Ayers assumed that people have an inner drive to develop sensory integration through participation in sensorimotor activities (Ayres, 1979). She believed that inner drive can be seen in the excitement, confidence, and effort that a child brings to an activity. While Ayres did stress the importance of inner drive, she did not explicitly link it to self-direction and self-actualization. Fischer, Murray and Bundy (1991) addressed this hole in Ayres' theory by providing a conceptual model called the Spiral Process of Self-Actualization.

Sensory Nourishment. Sensory input is necessary for optimal brain function. The brain is designed to constantly take in sensory information, and it malfunctions when deprived of it. Hubel and Wiesel's study of blindfolded kittens demonstrated that

inadequate inflow of sensation during critical periods in development result in brain abnormalities and behavioral disorders. Ayres (1979) considered sensory input as nourishing for the brain as food is for the body. Wilbarger (1984), a colleague of Ayres, further developed Ayres' concept of the sensory diet.

The therapeutic sensory diet provides the optimal combination of sensations at the appropriate intensities for an individual child. Typically developing children rarely need their sensory diet monitored. The environment naturally provides them with a nourishing variety of sensations. Those with sensory integration disorder, however, need enough sensory stimulation to redress the imbalance in their systems, while not over-stimulating them, which will actually be detrimental to development. To produce an optimal effect, they must actively use sensory input to act on the environment.

Children must be active participants in their sensory diet. They actively select those sensations most useful at the time. These sensations then help to organize them in a way that facilitates the child's accomplishment of their goals (such as how a child must integrate vestibular and proprioceptive system to learn how to balance on a bike). When a child makes an adaptive response (like successfully balancing the bike), change occurs at a neuronal synaptic level. In fact, when an organism is allowed to explore interesting environments, significant increases are seen in dendritic branching, synaptic connections, synaptic efficiency, and even in brain tissue size (Rosenzweig, Bennett, and Diamond, 1972). The sensory integration model posits that active rather than passive sensory input is the most therapeutic for these children. Thus, they experience a greater degree of integration when actively pumping themselves on a swing than have someone push them.

Ontogeny of Sensory Integration

Ayres (1979) theorized that sensory integration develops primarily in the first seven years of life. She believed that once children reach the age of seven or eight their sensory integration capabilities are almost as mature as in adults. Despite their mature sensory system, occupational therapists do continue to work with children as old as thirteen or fourteen years of age. They have found that providing therapeutic stimulation to sensory systems that were somehow unsuccessful in completing maturation, children can increase their sensory integration capabilities. Thus, an occupational therapist may have a nine year old child doing movements that are more typical of a two year old in order to build a stronger sensory integration foundation.

As the development of sensory integration builds a foundation on which to support increasing degrees of complexity, children are better able to attach meaning to the stream of sensations they experience. They become increasingly proficient at turning their attention to what they perceive as meaningful, and can tune out what is unrelated to their present needs. The result is that they can organize play behavior for increasing lengths of time and improve their regulation of emotions.

Inner drive motivates children to seek out available "just right challenges" in their environments. "Just right challenges" are movement challenges that are not so difficult to lead failure or overwhelm, but also are not so simple that they are uninteresting or routine. These challenges require effort but are achievable and encourage adaptive responses, and also lead to a sense of mastery and self-efficacy.

In typically developing children inner drive can be observed in their ability to acquire basic developmental skills such as manipulating objects, crawling, sitting,

walking, and climbing with very little adult guidance. Their active and well-balanced nervous systems can also learn daily occupations such as self dressing and feeding, drawing, painting, and climbing on playground equipment simply by seeking out "just right challenges." There is only a small amount of variation in their attaining normal early child developmental benchmarks because development is so genetically programmed. As they progress past the first year of life, variations increase due to differing genetic, environmental, familial, cultural, and personal experiences (Parham & Mailloux, 1996).

The following paragraphs outline the process of sensory integration development. These are known as Basic Neurological Actions in the Body-Mind Centering field, which was developed by occupational therapist Bonnie Bainbridge Cohen (discussed in more detail on page 35). They have great significance to the field of dance therapy because they serve not only as tags to indicate the developmental age of movement, but also to the emotional states which often accompany the reflexes and actions.

Prenatal Period. Response to sensory stimuli is first observed at approximately 5.5 weeks after conception (Short-DeGraff, 1988). The first responses are only avoidance reactions to tactile stimuli. Later, at nine weeks, approach responses occur. The first responses to vestibular input also occur at nine weeks in the form of the Moro reflex. By the time of birth, the fetus has developed a repertoire of reflexes including rooting, sucking, Babkin, grasp, flexor withdrawal, Galant, and neck righting. The newborn is well equipped with reflexes that facilitate a strong connection with the caregiver, as well as protecting its own physical integrity. These are the rudimentary aspects of sensory integration (Case-Smith, Allen & Pratt, 1996).

Neonatal Period. Touch, smell, and movement are sensations that are especially important to newborns, who use them to maintain contact with the caregiver. Tactile sensations are especially important in establishing the mother-infant bond, and thus key in developing feelings of security in the infant. The tactile system is thus terribly important in that it is the first sense that serves as a medium for physical, social contact. It facilitates the caretaker-infant bond because it allows the infant to mold its body to the caretakers, making the experience "cuddly." Eventually this will aid the infant's development of body scheme (the brain's map of the body and how its parts interrelate). Proprioceptive input is important for feelings of security, as reflected in the calming effect seen in most babies resulting from being tightly swaddled and firm pats on the back.

The vestibular system is fully developed at birth, as it is the first of all the sensory systems to develop. Caregivers naturally utilize the effect of the vestibular system on the infant's arousal level by using rocking, bouncing, and carrying to calm the infant. These movements stimulate, and thus help to organize and calm, the infant. This is because vestibular and proprioceptive input tend to organize and integrate the nervous system (Ayres, 1979). Being propped upright against the shoulder of a caregiver, however, organizes the nervous system to increase alertness and visual pursuit. Once upright, the pull of gravity stimulates the neck muscles to raise the head off the shoulder. Of course the infant will not be able to achieve stable head righting until sometime in the sixth month, but the initial reflex is present and becomes increasingly established as the baby assumes different positions. The visual and auditory systems are quite immature at birth. The newborn will orient to some visual and auditory inputs, but both systems will

dramatically increase their acuity during the first few months (Case-Smith, Allen & Pratt, 1996).

First Six Months. By the forth to sixth months, the infant's sensory systems have matured to accommodate greater interest and awareness in the world. Vestibular-proprioceptive-visual connections initiate the beginning of postural control. The infant increasingly shows an inner desire to resist gravity. Typical body positions include the prone position where the infant increases its ability to extend its neck and then trunk, while the arms gradually bear more weight to push the chest off the floor. By six months the infant has full prone extension, and some are able to sit with support from their own hands. These advances demonstrate a maturing vestibulospinal tract. Head control is also well developed which allows for a stable base for eye muscles. All of these demonstrate the growing integration of vestibular, proprioceptive, and visual systems, all of which support a stable visual field as the baby becomes more mobile (Case-Smith et al, 1996).

Somatosensory achievements are particularly evident in infant's use of hands. The infant uses tactile and proprioceptive sensations to grasp objects. Touch and visual systems are integrated as the baby reaches for, waves and bangs objects. There is a strong inner drive to play with the hands while bringing them to the midline, and connections between the visual and tactile systems are paving the way for later eye-hand coordination skills. Midline hand play is a significant milestone in the integration of the two side of the body.

Neonatal reflexes are now no longer dominating the infant's behavior. Rolling from prone to supine positions demonstrates their budding motor planning abilities. They are also reflected in their increased their ability to handle and manipulate objects. While

reflexes may play a role in these activities, they are goal directed responses to the changing characteristics of the environment (Case-Smith et al., 1996).

Second Six Months. During the second half of their first year, infants undergo a major transition. They become mobile in their environments. By the first year they can volitionally move from one place to another, whether by creeping, crawling, or walking thanks to increased integration of the sensory systems. As the infant explores the environment, they are presented with increased opportunity for integrating a variety of complex sensations, especially those responsible for developing body scheme and spatial perception.

Tactile perception is further refined during the second six months. Precise tactile feedback is needed while the infant develops greater hand control (a pincer grip). Babies also rely on proprioceptive information in developing the ability to satisfactorily manipulate objects. Transferring objects from one hand to another across the midline indicates further development of the proprioceptive system as well (Case-Smith et al.,1996).

Second Year. In the second year of life, vestibular, proprioceptive, and visual connections utilized in the first year are further refined resulting in more polished postural control and balance. Tactile discrimination and localization also allows for more refinement of fine motor skills.

Ayres (1972b) hypothesized that as body image becomes more sophisticated, so does motor planning ability. The child draws on knowledge of how the body works to plan, execute, and program new actions. During the second year the child experiments with novel body movements, and also imitates other's actions to increase her movement

vocabulary and generate new sensory experiences, which serve as a base to plan new actions.

During the second year of life a new phenomena of ideation begins to flourish. Ideation is the ability to conceptualize what to do in a given situation. It is made possible by the use of symbols, originally expressed with gestures, then vocally (Bretherton et all., 1982). Symbolic functioning allows the child to use pretend play to execute pretend actions (driving a car, shooting a gun), even if they have never actually done them before. By the end of year two children can link several pretend actions into a full play sequence. He also exhibits that he is planning certain actions by announcing them verbally or by searching for an object needed before starting. This demonstration of praxis plays a key role in developing the child's self-concept. Daniel Stern (1985) suggested that the sense of an integrated core self, beginning in infancy, was an outcome of the volition and the proprioceptive feedback involved in motor planning. As the child executes voluntary, planned actions on the world, he develops a sense of self as an agent of power. He feels in control of his own life when sensory integration allows him to move freely and effectively through the world (Ayres, 1979).

Third through Seventh Years. Ayres considered the third through sevenths years to be a critical period of maturation and sensory integration because of the brain's receptivity to sensations and its capacity to organize them during this time. Children have strong motivation to produce adaptive responses not only to meet complicated sensorimotor demands, but also to interact socially with their peers in games and activities. Visual-motor sophistication is developed as children work with crafts, blocks, drawing, and painting. Playground explorations encourage proprioception and vestibular

processing by swinging, sliding, climbing, jumping, riding, pushing, pulling, and pumping. Motor planning is developed and children attempt to master complicated activities such as jump rope, jacks, and hopscotch. Children's bodies are challenged to maintain balance during dynamic changes in body position in activities such as soccer, karate, gymnastics, and ballet. They must learn to anticipate movement in relation to the changing environment and to respond to other's unexpected movements. Most children have feelings of satisfaction and self-esteem as they master those occupations that are heavily dependant on sensory integration (Case-Smith et al., 1996).

When Problems Occur

When aspects of sensory integration don't function normally, the child will notice that daily activities such as dressing or balancing in a chair are much more difficult to execute than for peers. This leads to frustration and frequent failure, which in turn will result in a tendency to avoid such activities and sensory experiences with refusal or tantrums. If such avoidance continues for an extended amount of time the child may miss important sensory, social, and emotional experience.

Often these problems come from their central nervous system's inability to modulate the incoming sensory stimuli. Either their nervous systems fail to register enough sensation for them to use the sensory information, or they are overwhelmed by a flood of stimulation which makes attending to other, more important parts of their life nearly impossible (Case-Smith et al., 1996).

Sensory Modulation Problems

Modulation refers to the central nervous system's regulation of its own activity (Ayres, 1979). This means that the central nervous system responds to incoming stimuli in a manor matching the stimuli's intensity. The individual thus responds in a way that best matches the demands of the environment. When the CNS is not regulating its responses in an adaptive manor, this leaves the individual somewhere other than in the center of sensory responsivity continuum. While during the course of the day we may experience fluctuations across the continuum, most people tend to fall in the midrange area of optimal arousal. Dysfunction exists when fluctuations are extreme, or an individual tends to function primarily at one extreme end of the continuum or the other.

Those who tend to function at the hyporesponsive end of the spectrum have diminished sensory registration, and are extremely underresponsive to stimuli in that they fail to notice sensory stimuli which would get the attention of most people. This is of concern because children who fail to attend to relevant environmental stimuli are in danger of harming themselves. For example, they may not recognize or correctly interpret the danger of hot stoves or sirens and flashing lights. Individuals with sensory defensiveness are at the other end of the spectrum. They are overwhelmed and overstressed by ordinary sensory stimuli (Fischer et al., 1991).

Conclusion

By increasing our awareness of sensory integration and its treatment methods, dance therapists may be able to better serve their child clients. Dance therapists already understand the concepts of childhood development and developmental sequences. They

understand the power of the lower brain structures on our emotions and behaviors. They recognize that when we are able to match our behavior to our environmental and emotional needs, it feels good (or adaptive), and we are more likely to repeat the behavior. Dance therapists understand that their clients have an inner drive towards emotional health. Finally, dance therapists also understand that we need to undergo a variety of life experiences in order to respond appropriately to all situations in an organized and self-empowered manor.

While dance therapists understand these concepts, it is important that those working with children understand them in the sensory integration context. They will be better positioned to recognize the children's nervous system needs. In doing so, they can further support their emotional, social, and academic needs as well.

Dance/Movement Therapy

Dance therapy uses dance/movement as a psychotherapeutic tool. One of the main tenants of dance therapy is that the mind and body are connected, and that body movement reflects inner emotional states. Changes in movement behavior can also reflect and affect changes in the psyche. These changes can be facilitated by dance therapists to aid clients in the integration of their social, emotional, and physical lives.

History

In primitive societies, dance was as much a part of everyday life as eating and sleeping. Dance rituals were used to recognize life events, thus intimately integrating individuals with their life status, as well as with their communities. Meerloo (1960)

stated, “At the dawn of civilization dancing, religion, music and medicine were inseparable.” Modern Western living has lost the ritual of movement, and has even embraced dualism, which emphasizes the separation of mind and body. Even though the arts are supposed to elicit emotional responses, classical dance in the 19th and 20th centuries paid little attention to the emotional response of the dancers themselves (Levy, 1988).

The field of dance/movement therapy was developed by modern dancers who noticed psychological benefits of theirs and other’s dance/movement practices. They recognized that modern dance positively impacted people’s emotional and mental health. Modern dance is different from other forms of dance in that it appreciates and encourages individual expression in its performers. This was a new approach to dance, rebelling against the rigid, formulaic dance forms of ballet and show dancing of the late 1800s and early 1900s (Levy, 1988).

The founders of modern dance strove for authentic physical expression of emotional content in order to create a deeper connection and understanding between the dancers, the choreography, and the audience. In order to achieve this goal, they trained their dancers to personally tap into the emotional experience of the material and use their own experience of it to reflect in their dancing. Because every person and every body experiences the world differently, the resulting movement of the individual dancers was both unique and emotionally rich. Imgard Bartenieff (1975, p. 246) said,

> Modern dance replaced the fading content of Western dance with certain key notions: spontaneity, authenticity of individual expression, awareness of the body, themes that stressed a whole range of feelings and relationships. The great pioneers of its early

> years personified themes of human conflict, despair, frustration, and social crisis. Frequently the choreographer of the modern dancer crystallized into the age-old form of ritual. Such key innovations led directly to the essence of dance therapy.

John Martin (1972) was a dance critic who wrote about Mary Wigman, one of the pioneers of modern dance. He said,

> At its highest point of development we find the so-called expressionistic dancing with Mary Wigman as an outstanding practitioner. This class is in effect the modern dance in its purist manifestation. The basis of each composition… lies in a vision of something in human experience which touches the sublime. Its externalization… comes not by intellectual planning but by feeling through with a sensitive body. The … result… is the appearance of entirely authentic movements which are as closely allied to the emotional experience as an instinctive recoil is to an experience of fear (pp. 56-60).

During the 1940s modern dancers began to recognize the emotional and mental therapeutic benefits of creative movement. Without the awareness of others doing the same, they individually began to bring movement into the back wards of mental institutions. Since there were no educational institutions teaching this entirely new medium of therapeutic expression, inexperienced but willing dance therapists to-be would apprentice themselves to practicing dance therapists in the field to learn more about the trade.

The women starting dance therapy were definitely influenced by the field of psychology. During that time, the focus of psychology was on verbalization as a medium

of expression for the unconscious. Despite the fact that none of the psychological theorists ever discussed nonverbal therapies, some of their concepts and techniques helped to organize a foundation for dance therapy pioneers (Levy, 1988). Some of these theorists included Sigmund Freud, Carl Jung, and Harry Stack Sullivan.

Freud didn't emphasize nonverbal communication, but he did recognize the connection between the body and emotions. He believed that conflict is the responsibility of the ego, which is "…first and foremost a body-ego" (Freud, 1923, p.31). He also recognized that the client's nonverbal communication could be used as a tool in psychoanalysis…

> He that has eyes to see and ears to hear may convince himself that no mortal can keep a secret. If the lips are silent, he chatters with his finger tips; betrayal oozes out of him at every pore. And thus the task of making conscious the most hidden recesses of mind is one which it is quite possible to accomplish (Freud, 1905, pp. 77-78).

Carl Jung advocated the theory of active imagination, which gave credence to therapeutic act of creativity. He believed that primitive unconscious material can manifest in artistic experiences symbolically, and can be evoked through active imagination. Mary Whitehouse was a pioneer of dance movement therapy. She integrated Jung's concepts into her own work, which encourages creative expression through improvisational movement to evoke the unconscious (Levy, 1988).

Harry Stack Sullivan has also greatly influenced the field of dance therapy by focusing on accepting schizophrenics at their own developmental level and interacting with them at this level. This reverberated with Marian Chace, another pioneer of dance

therapy. She mimicked his acceptance of clients as equal human beings who could benefit from genuine communications with others (Levy, 1988). Although there are many other theorists who have impacted the approaches of dance therapy pioneers and their disciples, the author will focus on Mary Whitehouse and Marian Chace.

As the pioneering dance therapists refined their theories and approaches, they began to offer trainings and private apprenticeships, but there were no standardized requirements for professional training. As different action-oriented therapies were becoming more widely accepted, dance therapists began to recognize that they needed to professionalize the field. The American Dance Therapy Association (ADTA) was founded in 1966, headed by Marian Chace. The ADTA then began to clarify education requirements, and standardize the definition of dance therapy (Levy, 1988).

Present Dance Therapy

The ADTA's definition of dance therapy is "the psychotherapeutic use of movement as a process which furthers the emotional, cognitive, social and physical integration of the individual." It is used in private practice, hospitals, or as part of multi-disciplinary teams. Dance therapists work with individuals and groups, using many different approaches and techniques. Sometimes therapists move with clients, while other times will maintain a more observatory orientation. A wide range of client populations can be treated with DMT, such as the mentally handicapped, emotionally disturbed children and adolescents, psychiatric patients, families, addicts, and the elderly (Payne, 1992).

The Standing Committee for the Arts Therapies Professions in the UK created another definition of dance therapy. It states that,

> Dance Movement Therapy is the use of expressive movement and dance as a vehicle through which an individual can engage in the process of personal integration and growth. It is founded on the principle that there is a relationship between motion and emotion and that by exploring a more varied vocabulary of movement people experience the possibility of becoming more securely balanced yet increasingly spontaneous and adaptable. Through movement and dance each person's inner world becomes tangible, individuals share much of their personal symbolism and in dancing together relationships become visible. The dance movement therapist creates a holding environment in which such feelings can be safely expressed, acknowledged and communicated (Payne, 1992, p.4).

Generally dance movement therapy (DMT) sessions have an introductory warm-up time which prepares the body for potentially vigorous action, and releases pent-up energy or constriction in the body which can block recognition of emotional material. It is followed by a period of moving in a deeper exploration of themes arising spontaneously, or by suggestion of the therapist. Finally there is a cool-down stage, which further integrates the emotional and physical material for the client, and prepares for the closure of the session and reentry to everyday life (Payne, 1992).

Dance Therapy Pioneers

Marion Chace. Marion Chace began to bring her work as a dance therapist into the back wards of east coast mental hospitals in the 1940's. Her work with the non-verbal

population proved to be effective. Preceding her work as a dance therapist, however, she originally trained, and eventually taught, at the Denishawn modern dance school and company. While there she recognized the greater implications for dance in its relation to personal expression. She felt that dance was a valid therapeutic modality because it is a universally human vehicle for communication.

A fundamental tenant of Chace's theory was that dance is communication and this fulfills a basic human need (Chaiklin & Schmais, 1979). Her theory was very much influenced by Harry Stack Sullivan who stressed the importance of respecting the schizophrenic patient as a unique individual, deserving of genuine interpersonal interactions and rapport. Chace felt that clients who were non-verbal would be unable to participate in genuine interactions verbally, and thus utilized her movement training to do so physically.

Chaiklin and Schmais, both students of Chace, worked together to elucidate the central concepts of Chace's theoretical methodology. The four concepts they identified were a) body action, b) symbolism, c) therapeutic movement relationship, and d) rhythmic group activity (Levy, 1988).

Body action, as Chace believed, enabled clients to release emotional expression, and provide therapists with information about how to facilitate each session.

> Through dance action, the patient gains motility of the skeletal musculature. Recognizing the body parts, breathing patterns or tension levels which block emotional expression provides the therapist with clues to the sequence of physical actions that can develop readiness for emotional responsiveness (Chaiklin & Schmais, 1979, p. 17).

A perceptive eye can notice physical and emotional blocks/tension. The therapist can provide opportunities for clients to move their bodies based on their observation of clients, which increases the relationship between motility, dance, and emotional expression.

Symbolism describes Marian Chace's uses of imagery, fantasy, recollection and enactment elicited through a combination of visualization, verbalization and dance action. She felt that all problems needed to be worked out through interpretation and analysis. By utilizing concepts less charged than repressed and frightening emotions, clients could more easily express their needs, feelings and desires. Once the clients experience support of the empathic therapist, they experience a deeper sense of trust and acceptance of their own expressive process. This in turn supports continued movement explorations, and allows the content behind the symbolic forms and images to continue emerging into consciousness (Levy, 1988).

Therapeutic Movement Relationship is the third central concept of Chace's work. By using "mirroring" and "reflection", the therapist engages in a physical and emotional relationship with clients to reflect deep acceptance and understanding. By empathizing with clients non-verbally the therapist is essentially telling them that they are understood, and validates their present experience of themselves. Giving clients the full value of Chace's attention allowed them to feel accepted, and thus more open to her encouragement to explore a broader range of movement repertoire and emotional resources (Levy, 1988).

Chace used Group Rhythmic Movement Relationship to facilitate and support the expression of thoughts and feelings in an organized and contained manner. It also

encourages all participants, even the more severely withdrawn, to join the community of movers. The contagious rhythm and simple movements entice reticent clients to step up their engagement, while providing a moderating structure for those with more extreme behaviors. By using clients own movements during the group activity, and suggesting their related symbolism and content, Chace would enhance the clients awareness of their body language and its meaning. They were gradually more able to modify their behavior and even verbalize some of the underlying conflicts (Levy, 1988).

There are three stages to her methodology: warm-up, theme development, and closure. Warm-up consists of three elements; A) Initial contacts gauged the general tenor of the group while greeting each client. B) Group development established trust and openness in the group by building individual and group rapport. This required a careful sense of timing. Imposing structure too soon or too late would decrease participation. C) Initiated simple rhythmic movement of the chest, abdomen and pelvic areas. These three elements allowed clients to move their bodies in a pleasurable way, releasing tension that could otherwise dampen their expression of emotional content. (Levy, 1988).

The theme development stage addressed emotional themes that surfaced during warm-up. Because the group tends to be more cohesive after warm-up, Chace could focus on deeper emotional themes through imagery, verbalization, leading questions, and movement. For example, having noticed movement suggesting a “get off my back” theme, Chace would draw the group more deeply into that theme with various techniques: mimicking the suggestive movement, embellishing it with corresponding sounds or

phrases, or asking questions such as “Who’s on your back? What’s on your back? How does it feel to have it on your back?” (Levy, 1988).

The closure stage grounded each individual’s experience and exploration of the emotional themes within the supportive context of the group. Chace would “conclude the session by utilizing repetitive communal movements that would provide the group with a feeling of connection, support, solidarity, and well-being” (Levy, 1988, p. 31). Sessions often ended with members “spontaneously sharing feelings, memories, and experiences verbally. Through this sharing, emotions were organized into meaningful verbal communication” (Levy, 1988, p.31).

Mary Whitehouse. A west coast pioneer of dance therapy, Mary Whitehouse began her work called “movement in depth” in the 1950’s. Unlike Marian Chace’s population, however, Whitehouse worked with dance students who she regarded as highly functioning.

> Whitehouse believed that with students, a greater emphasis could be put on uncovering unconscious material’ whereas with hospitalized patients, due to a more fragile ego structure, greater stress needed to be placed on emotional support and providing patients with more structured forms of expressive movement (Levy, 1988).

Many of her clients were already in verbal therapy as well as already being skilled movers. This allowed her to facilitate deeper emotional and movement explorations (Levy, 1988).

Based on her dance training with Mary Wigman, and her own personal experiences in Jungian psychoanalysis, she developed “movement in depth” with five

major issues relevant to its process. They are 1) Kinesthetic Awareness, 2) Polarity, 3) Active Imagination, 4) Authentic Movement, and 5) Therapeutic Relationship/Intuition.

Internal awareness of one's physical self describes Whitehouse's Kinesthetic Awareness. She believed that for those who had less kinesthetic sense than others, it could be developed and expanded through increased attention and awareness. Through this practice, clients have a more intimate knowledge of how movement can elicit unique subjective feelings.

The concept of polarity dovetails with Whitehouse's experience with Jungian psychology's work with "shadow" material. She emphasized that our lives are not "cut and dried" as we might think. That is, "while we may be forced to choose one path in life over another, or one form of expression over another, the one not chosen for conscious expression does not go away, it simply goes unrecognized" (Levy, 1988). In movement, while one muscle is contracting the other is necessarily doing the polar opposite by stretching. Because it is virtually impossible to do one without the other, she felt dance was an important vehicle to encourage the recognition, and expression of, opposing drives.

Active Imagination is another concept Whitehouse gleaned from Jungian method. It is used to bring to the surface unconscious material which she felt was imbedded in the body. It is important, however, for the conscious self to relinquish control over self-expression. "While consciousness looks on, participating but not directing, cooperating but no choosing, the unconscious is allowed to speak whatever and however it likes" Whitehouse, 1979, p. 58).

Authentic Movement is required in order to allow Active Imagination to flourish. It is movement which is entirely generated from the depth of one's emotional experience, and which is not at all censored by the ego. Whitehouse used the term "I am moved" to describe the inevitability of Authentic Movement verses the ego-controlled and monitored "I move."

> The core of the movement experience is the sensation of moving and being moved… 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 (Whitehouse, 1963, p. 4).

In this manor Authentic Movement seems to include the concept of Polarity because both the conscious and unconscious are present, although the ego is encouraged to support instead of interfere with expression of emotional content.

Finally, Whitehouse stressed that Therapeutic Relationship/Intuition was the avenue through which the therapist must trust her own intuition, and then help the clients to trust theirs. This requires that the therapist put aside assumptions of what clients should do, and allow them to direct flow of the session. At the same time, therapists need to intervene when it feels appropriate and be open to the clients' acceptance or rejection of their intervention. This supports their expression of needs, and thus supports trust in themselves to deepen their exploration.

Body-Mind Centering

Body-Mind Centering was developed by occupational therapist Bonnie Bainbridge-Cohen. It is an experiential approach to anatomy, kinesiology, and physiology and a study of the balance between inner awareness and personal movement through space. Body-Mind Centering is based on the interrelationship between the body systems and the developmental movement patterns.

In particular, the developmental movement patterns (called basic neurological actions) are based on the sensory motor development of the human infant through the first year of life. They are the foundation for gaining and maintaining balance, spatial awareness, and unified muscle tone. If an infant has incomplete patterns or gaps in this sensory-motor sequence, these gaps can be reflected later in movement difficulties, emotional challenges and learning disorders.

The individual can, by re-learning the developmental sequence, fill in the gaps in development and re-pattern sensory and motor organization. The movements infants use first are pushes, then reaches, and finally pulls. These movements are each used in homologous, homolateral, and contralateral sequences. Therefore, these developmental movements are important to revisit because they primarily determine our current patterns of alignment coordination and perception (Bainbridge-Cohen, 1993).

Laban Movement Analysis

Rudolf Laban created a system of movement observation and analysis, brought to the United States by Irmgard Bartenieff in the 1930's. Laban recognized that humans have unique ways of moving, but that these unique qualities could be broken down into

four pairs of "effort qualities." He believed that people have certain preferences for different effort qualities, but they do have the option of expanding their movement capacities. He believed that the more these personal preferences were identified, the more an individual could consciously chose to expand their movement repertoire via the efforts.

The efforts include: (a) space - bound/free, (b) time - sudden/sustained, (c) weight – strong/light, and (d) flow – bound/free. Laban also described the different planes of movement through which people can travel through space. The first plane is the sagittal (or wheel) plane (forward, down, back and up). The second plane is the vertical plane (up, right, down, left). The third is the horizontal plane (front, right, back, left).

Kestenberg Movement Profile

Dr. Judith Kestenberg, a psychiatrist and psychoanalyst, developed her movement profile by borrowing concepts from Rudolf Laban and Warren Lamb. She expanded Laban Movement Analysis by adding subsystems of movement patterns to Laban's Effort and Shape patterns. She also integrated concepts of Laban Movement Analysis with psychoanalytic theory. By anchoring psychoanalytic developmental theory in the study of the body and its movement patterns, the Kestenberg Movement Profile supports the practice of dance therapy. It can help dance therapists to focus on functional and adaptive behavior versus dysfunctional and maladaptive behavior (Kennedy, 2000).

One aspect of Kestenberg Movement Profile to be utilized later in the manual are the tension-flow rhythms. These are the developmental precursors to the effort actions of Laban Movement Analysis. The rhythms exist in two contrasting categories, indulging

and fighting. The psychodynamic expression within these rhythms concerns the satisfaction of one's biological needs, psychological drives, and the differences between safety and danger.

The psychoanalytic developmental progression of these rhythms start with oral, then anal, urethral, inner genital and outer genital. In the indulging category, corresponding rhythms are sucking, twisting, running/drifting, swaying, and jumping. The corresponding fighting rhythms are biting, strain/release, stop/start, surging/birthing, and spurting/ramming.

Another aspect of Kestenberg Movement Profile is the shape-flow notation. Bipolar shape-flow is the first expression of pleasure and displeasure to the environment. Bipolar refers to symmetrical movement (head and tail, front and back, side to side). Like the tension-flow rhythms, bipolar shape-flow includes two contrasting categories, growing and shrinking. In the growing category there are bipolar widening, lengthening and bulging. In the shrinking category there are bipolar narrowing, shortening, and hollowing. Advancing developmentally, unipolar shape-flow is more directionally selective, and not symmetrical at all. Thus the individual has the choice to lengthen or shorten up or down, bulge or hollow forward, etc. Refer to figures twelve through fifteen to review the tension-flow and shape-flow information in more depth.

Combining Occupational Therapy and Dance Therapy

Combining with Dance Therapy

Both dance therapy and occupational therapy theories strive to help their clients increase adaptive behaviors, achieving balance and integration in their lives. They both contribute to the behavioral and emotional well being of their clients. Sensory integration theory does this by carefully examining of the nervous system to find the reasons behind children's academic, motor, and emotional difficulties. Dance therapy does this by studying the effects of movement on people's ability to expand their personal awareness and expression of thoughts and emotions. While both fields are independently valid and autonomous, there is much they can learn from each other.

Comparing and Contrasting

While sensory integration theory recognizes that deficits in sensory processing can eventually result in loss of self-esteem, self-efficacy, and in behavior problems, it has not deeply investigated the emotional content embodied in its movement interventions. Dance therapy is in a similar boat. Despite its recognition of emotional content in movement and physical expression, and dance therapy hasn't explained the physiological reasons that particular types of movement interventions affect our emotional health. Tapping into occupational therapy's knowledge can further explain the biological basis of developmental psychology, and the reasons that movement therapy can be so useful working with children. Dance therapy and sensory integration therapy can serve to increase the child's mental, emotional, and physical integration, especially if used in combination.

The two therapies are both body-based. They both use the body to ascertain levels of health or deficiency. Both types of therapists are trained in anatomy, physiology, and kinesiology. From this body-based framework they both implement treatment in the goal of greater integration and functioning.

There are, however, some important differences between the two fields. While dance therapy studies the nervous system and its role in our emotional states, it recognizes it as only a discreet part in a larger domain of information to be analyzed in regard to our emotional make-up. Sensory integration is mostly concerned with the nervous system, and sees emotional well-being as an important positive side effect of better sensory integration.

Sensory integration therapy also uses a battery of seventeen sensory integration tests called the SIPT (Sensory Integration and Praxis Tests). They measure tactile, vestibular-proprioceptive, and visual processing, as well as motor planning capability. Occupational therapists must be well trained to administer these tests. Dance therapy assessment tends to be less formal and more intuitive. They tend to utilize assessment tools that notate movement qualities. Laban Movement Analysis and Kestenberg Movement Profile are two assessment tools dance therapists tend to use. They both provide a language with which to describe movement. They also can provide opposing movements to balance a client's limited movement vocabulary. Body-Mind Centering is another framework which many dance therapists use to describe movement quality. Because it was developed by an occupational therapist it is a resource bridging physiological exploration and perception with emotional embodiment.

There is some initial research linking dance therapy with sensory integration therapy. Brenda Lucero (1998) studied the effects of combining sensory integration with dance therapy in adolescents. In that case study adolescents in a residential treatment facility were randomly chosen to participate in "Sensory Movement" groups once a week prior to group dance therapy sessions to see if they were better able to process psychotherapeutic content within the context of dance therapy. The results suggested that subjects' ability to focus and attend to the therapeutic process during dance therapy sessions increased, but it could not be determined if there was an increased integration of the therapeutic process itself.

Lucero's study did not focus on the inclusion of sensory movement interventions within dance therapy, however. In order to do so, occupational movement interventions must be examined not only for their effect on the nervous system, but also translated into language dance therapists can understand and explored for their socio-emotional impact. The following occupational therapy session will be described using terminology form both Body-Mind Centering and Kestenberg Movement Profile.

OT Session Described in DMT Language

Elaine B. Wilson (1998), a student of A. Jean Ayres, describes a typical occupational therapy session she would structure for elementary aged children with sensory integration challenges. She begins with "linear movement" (see figure 1), which demands the children utilize the spinal pushes and reaches first utilized by newborns. The children lie vertically on a bolster swing and try to make it swing back and forth. This movement stimulates the vestibular system. She then encourages them to try it sitting, which incorporates sagittal bulging and hollowing, and further uses spinal pushes from

the pelvic floor (figure 2). Both represent the expression of pleasure and displeasure in dance therapy. She finally brings them to a contralateral kneeling position, requiring fine and gross motor adjustments to remain balanced in this "higher" basic neurological action (figure 3). Contralateral actions are about accepting some things while simultaneously rejecting others. To increase muscle tone and balance while also stimulating the vestibular and proprioceptive systems, Wilson will also have children bounce around an inflated inner tube on their feet and bottoms (homologous push from the feet, spinal push from the pelvic floor, and activated balance) (figures 4 + 5).

Next Wilson has the children lie on scooter boards to encourage prone extension, supine flexion, and balance (figures 6 + 7). This movement also stimulates the vestibular system. In KMP terms, these require growing and shrinking movements described by shape-flow/shaping notation, especially the most basic bipolar ones. They also give the children a chance to use their homologous reaches from both the upper and lower body. Homologous reaching is about wholehearted desire, which taken to the extreme can be destabilizing. This type of organization asks children to organize themselves in order to express basic reactions to their environment (I want that, I don't want that). Parachute use also encourages children to assume that fully extended posture. This entails lifting the parachute from the floor with both hands and raising it to the ceiling as high as possible, which requires dorsal flexion and results in unipolar lengthening upwards. Swinging in nets can encourage the same types of movement (figure 8), but can also encourage homologous pushes ("I don't want that") from the arms (figure 9).

When completely enclosed in the net and swung in circles, children will experience rotary movement to encourage them to fully yield into the containment of the

net (figure 10). The child is actually quite passive, and will experience a feeling of indirect space, free flow, and light use of weight (spell drive). When children experience too much of this type of sensory input they often feel nauseous. More recent sensory integration thinking, however, now rarely encourages imposed rotation on children.

To counteract the experience to too much swaying rhythm (an indulging quality) Wilson has the children play "push o'war" (figure 11). This taps into the more fighting elements of bound flow, direct space and strong weight. The emotional tone should switch from one of releasing into and indulging container, to an assertion of one's rights and a sense of self-sufficiency

In general, the above sensory integration session was mostly about stimulating the vestibular and proprioceptive systems. By describing it in dance therapy terminology we can deduce what the client might be experiencing emotionally in reaction to executing those particular movements. There are many similarities between types of somatic interventions between occupational therapy and dance therapy. It is simply important for dance therapists to examine the movement interventions not only for their nervous system reverberations but also for their emotional impacts. Because the following manual focuses on the vestibular and proprioceptive systems, more attentions should be focused on those two senses to explore their sensory integrative and emotional implications.

Impacts of Vestibular Stimulation

Vestibular system stimulation most typically exists within the Indulging side of the Kestenberg Movement Profile's Tension-Flow rhythms. Tension-Flow rhythms are about attaining satisfaction of our biological needs, and about the psychological drives of

safety and danger. The indulging qualities (as opposed to fighting) tend to be less assertive and more soothing and rhythmic. In particular, you should try to use sucking, swaying, or jumping rhythms (their opposites are biting, surging, and ramming rhythms). Spinning and rolling movements naturally spreads the body out in horizontal space due to centrifugal force. This could be described as releasing some of one's ego outward, which is similar to spiritual expression (Sufi dancing often utilizes circular spinning). It is important to remember our natural tendency to "hold ourselves together" at these times, however. Your clients may be experiencing some combination of these two experiences.

In Body-Mind Centering terms, these vestibular stimulation movements tend to be more focused on the earlier Basic Neurological Actions. Some examples are spinal pushes and reaches from the head and pelvic floor, and homologous pushes and reaches of the arms and legs. Similar to the KMP tension-flow rhythms, these first basic actions are about reaching for what you want and pushing away what you don't. While doing these exercises, remember that your client's head (and thus inner ear) must be moving through space and changing directions to trigger a vestibular sensory response.

Impacts of Proprioceptive Stimulation

Activities for proprioceptive stimulation are assembled on the fighting side of Kestenberg Movement Profiles tension-flow rhythms. Most often these movement activities will be in the strain/release, surging/birthing, and spurting/ramming rhythms. They often require extremely strong, direct efforts.

In Body-Mind Centering theory these movements require very strong pushes initiating from all of the endpoints (hands, feet, head, pelvic floor). It doesn't really

matter if you encourage homologous, homolateral, or contralateral movement, as long as the movements are strong.

Final Arguments

Although the intentions of the OT is simply to "improve the child's functional performances and to enhance the child's ability to interact within his or her physical and social environments" (Case-Smith, Allen, and Pratt, 1996, p.4), it would seem that they are also providing opportunities for their clients to experience very fundamental emotional states which correspond with the movement and posture interventions. Further investigation of dance therapy and occupational therapy similarities will hopefully reveal more about the physiology of dance therapy, as well as direct it to further aid clients who also have sensory integration issues.

Case Study Methodology

Method

Setting

A dance therapist's office in a public elementary school.

Subjects

The dance therapist working with elementary aged children was chosen because she was working with elementary aged children within the Denver Metro area.

Procedure

A manual was created for dance therapists that describes sensory integration disorder, and provides an assessment form that directs therapists to the appropriate sensory integration based interventions. A dance therapist selected clients in her practice whom she felt would benefit from movement interventions informed by sensory integration as recommended in the manual. She completed a qualitative pre-test questionnaire, and met with two clients, both individually for two sessions. She then recorded her experiences in a journal after each session. Finally, she was interviewed and tape-recorded to explore her experience of the occupational movement interventions, and her observations of her clients.

Sensory Integration Movement Manual for Dance Therapists

Introduction

This manual was developed as a thesis project. It should be used by trained dance therapists who have clients displaying symptoms of sensory integration disorder. It is not a recipe book for how to do sensory integration therapy, nor is it an appropriate assessment tool for diagnosing sensory integration disorder. Rather, it offers movement interventions recommended by the field of occupational therapy as appropriate for children who might have certain sensory integration issues. Dance therapists are encouraged to seek further education and support by registered occupational therapists if they want to further explore sensory integration theory and treatment.

The manual is designed for dance therapists working with elementary aged children. Sensory integration theory is based in the belief that the central nervous system has more plasticity, and thus a higher capability of correction during the earlier years. By the time children begin entering junior high school their nervous system becomes more hard-wired. At that point sensory integration improvement becomes minimal.

This manual will enable dance therapists to synthesize their psychotherapeutic expertise with the awareness of neurological issues of sensory integration. Dance therapists will recognize many of the movement interventions in this manual, as these occupational therapy interventions are already in the dance therapist's repertoire. Dance therapy and sensory integration therapy can serve to increase the child's mental, emotional and physical integration, especially if used in combination.

Review of Sensory Integration

Sensory integration is generally defined as:

> The neurological process that organizes sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment. The spatial and temporal aspects of inputs from different sensory modalities are interpreted, associated, and unified. Sensory integration is information processing... The brain must select, enhance, inhibit, compare, and associate the sensory information in a flexible, constantly changing pattern; in other words, the brain must integrate it (Ayres, 1989, p. 11).

Sensory integration theory has three important postulates. First, normally functioning individuals naturally take in sensory information from their environment and from their own bodies. Their central nervous systems process and integrate the information and use it to plan and organize their behavior. Second, abnormalities in the integration of sensory input can result in conceptual and motor learning difficulties. Third, sensory integration can be enhanced by providing sensory experiences within the context of meaningful activity. Encouraging client's planning and production of adaptive behaviors can also enhance sensory integration. Moreover, improvements in sensory integration can enhance learning (Fischer, Murray & Bundy, 1991).

Sensory integration therapy works mostly with the proximal senses, which include the vestibular, tactile, and proprioceptive. The theory of sensory integration was developed upon the belief that these body-centered senses are a foundation on which complex occupations are scaffolded. A. Jean Ayres (1979), the occupational therapist

who developed the theory and treatment of sensory integration, theorized that sensory integration develops primarily in the first seven years of life.

As the development of sensory integration develops with increasing degrees of complexity, children begin to attach meaning to the stream of sensations experienced. They become increasingly proficient at turning their attention to what they perceive as meaningful, and can tune out what is unrelated to their present needs. The result is that they can organize play behavior for increasing lengths of time and increase their regulation of emotions. Inner drive motivates children to seek out available "just right challenges" in their environments. "Just right challenges" are not so difficult as to lead to failure or overwhelm, but also are not so simple that they are uninteresting or routine. The "just right challenge" requires effort but is achievable and encourages adaptive responses, and also leads to a sense of mastery and self-efficacy.

In typically developing children this can be observed in their ability to acquire basic developmental skills such as manipulating objects, sitting, walking, and climbing with very little adult guidance. By seeking out "just right challenges" their active and well-balanced nervous systems can also learn daily occupations such as dressing and feeding oneself, drawing, painting, and climbing on playground equipment. There is only a small amount of variation in the attainment of normal early child developmental benchmarks because development is so genetically programmed.

In Bonnie Bainbridge Cohen's theory of Body-Mind Centering, basic neurological actions describe the benchmarks of genetically programmed development. In particular, the developmental movement patterns are based on the sensory motor development of the human infant through the first year of life. They are the foundation

for gaining and maintaining balance, spatial awareness, and unified muscle tone. If an infant has incomplete patterns or gaps in this sensory-motor sequence, these gaps can be reflected later in movement difficulties, emotional challenges and learning disorders.

The individual can, by re-learning the developmental sequence, fill in the gaps in development and re-pattern sensory and motor organization. The movement infants use first are pushes, then reaches, and finally pulls. These movements are used in the sequences of homologous, homolateral, and contralateral movements. Therefore, these developmental movements are important to revisit because they primarily determine our current patterns of alignment coordination and perception (Bainbridge-Cohen, 1993). Refer to figure fifteen to see the actions drawn in detail.

The sensory integration process is assumed to occur in a developmental sequence. Generally, the early development of simple behaviors enables children to learn increasingly complex behaviors in later development. This manual addresses the vestibular and proprioceptive systems because the typical dance therapy session already stimulates those systems without most dance therapists' knowledge. Dance therapists are also likely to have the props to aid in the stimulation those systems.

Although the sense of touch is extremely important to children's sensory integration health, very important in caretaker-infant social bonding, and in the development of a working body image, it will not be addressed in this manual. Many children in therapy have experienced some form of trauma around issues of touch. While touch may be an appropriate occupational therapy intervention, it may be re-traumatizing in a psychotherapeutic setting. Dance therapists are also less likely to have appropriate tactile stimulation props at hand.

Proprioceptive System

Muscular, tendon, and joint movement are involved in the sensory feedback known as proprioception. Thanks to this sense we are able to check the orientation of our bodies (and body parts) in space, register the rate and timing of our movements, and note the speed and intensity with which our muscles are being stretched and contracted. Pushing, pulling, lifting, and carrying heavy items allow the brain to use proprioceptive input effectively through muscle and joint sensation. Because the proprioceptive system measures the amount a muscle moves itself, it is especially important that the client be an active mover instead of a passive recipient of bodily movement. This will create a neuronal memory of how it feels to move in a particular way, and what it achieves.

Proprioception travels up the spinal cord to the brain stem and cerebellum, and a small amount of the information reaches the cerebral hemispheres. Most of this input is processed in regions that don't typically promote conscious awareness, and it takes effort to be aware of even a small percentage of proprioceptive information. When proprioception is impeded, we must rely much more heavily on visual cues. This makes buttoning a shirt, typing, and climbing stairs extremely difficult. Children with poorly organized proprioception usually have trouble doing activities they cannot see with their eyes.

Vestibular System

The vestibular system is involved in three major functions: subjective awareness of body position and movement in space; postural tone and equilibrium; and stabilization

of the eyes in space during movement. The two different vestibular receptors are housed in the inner ear.

One detects the force of gravity by measuring the direction of its pull on tiny hairs weighted with calcium carbonate crystals in the inner ear. Because gravity is always present on this planet, the gravity receptors send a perpetual stream of vestibular messages. The sensory information changes depending on the direction of the head's movement.

The second vestibular receptor lies in the three fluid filled semicircular canals within the inner ear. These canals lie in 90 degree angles from each other, assessing the three dimensions of movement (forward and back, left and right, up and down). As the head moves in any direction, the fluid backs up in the opposite direction, allowing the receptors to note the direction and speed of acceleration.

The combination of both types of vestibular reception can tells us precisely where our heads are in relationship to gravity, whether we are moving, in what direction, and at what speed. This system begins working in the tenth week of pregnancy, and is fully developed by the fifth month of pregnancy. The mother's movement continually stimulates the fetus's own vestibular receptors. Caregivers naturally utilize the effect of the vestibular system on the infant's arousal level by using rocking, bouncing, and carrying to calm the infant. These movements stimulate, and thus organize and calm the infant. This is because they tend to organize and integrate the nervous system. Because vestibular sensation is ever present, about the only time we normally notice it is when it is disrupted, such as after spinning in circles.

The reticular core of the brain sends impulses throughout the entire brain to awaken and alert the person. The vestibular system feeds sensory impulses into this reticular arousal system. When the vestibular system is under-active, there is not enough stimulation to the reticular arousal system to modulate alertness. The result is hyperactivity and distractibility. As the developer of sensory integration theory and therapy said, "in sensory integrative therapy vestibular stimulation is used to either quiet, stimulate, or organize a child's activity level" (Ayres, 1979, p. 4).

Sensory Modulation

Modulation refers to the central nervous system's regulation of its own activity. This means that the central nervous system responds to incoming stimuli in a manor matching the stimuli's intensity. The individual thus responds in a way best matching the demands of the environment. When the central nervous system is not regulating its responses in an adaptive manor, this leaves the individual somewhere other than in the center of sensory responsivity continuum. While during the course of the day we may experience fluctuations across the continuum, most people tend to fall in the midrange area of optimal arousal. Dysfunction exists when fluctuations are extreme, or an individual tends to function primarily at one extreme end of the continuum or the other.

Those who tend to function at the hyporesponsive end of the spectrum have diminished sensory registration, and are extremely underresponsive to stimuli in that they fail to notice sensory stimuli which would get the attention of most people. This is of concern because children who fail to attend to relevant environmental stimuli are in danger of harming themselves. For example, they may not recognize or correctly interpret the danger of hot stoves or sirens and flashing lights. Individuals with sensory

defensiveness are at the other end of the spectrum. They are overwhelmed and overstressed by ordinary sensory stimuli.

Assessment

It must be stressed again that this is not a sensory integration assessment. There is a highly extensive amount of information needed for that, as well as a battery of tests one must be highly trained to administer. The battery supplies numerical data on how well a child is integrating sensory information. This assessment form is merely to aid dance therapists in recognizing and encouraging certain types of movement that may address a child's particular sensory integration issues.

Symptoms of sensory integration disorder often include hyperactivity and distractibility. These are often the first symptoms noticed by parents and teachers. It is often difficult for these children to organize and slow themselves long enough to accomplish tasks, especially as they get more complex. Distractibility makes it difficult for them to pay attention in school because they are less able to ignore less important sensory information (cars outside, the second hand on the clock, other children's movement).

Behavior problems are also common to children with sensory integration disorder. Because their brains work differently, they often react differently than other children in the same circumstance. These children are generally less happy as things never go "right" for them. They may be especially fussy or have difficulty enjoying themselves with friends and family. Because others do not like such behavior, children with sensory integration disorder are often disliked and rejected.

This leads to downward spiral of rejection, poor self-concept, more negative behavior and thus more rejection. These children must live with not only the uncomfortable knowledge that they aren't "normal," but also with parents and peers rejection of them. Because of this rejection they are often trying to make themselves feel successful and important. In order to do so they often need to ignore the needs of others, which serves to further isolate them. It is important to remember, however, that children with motor planning problems often do not have behavior problems.

Muscle tone and coordination are also affected by poor sensory integration. Sensations from vestibular and proprioceptive systems provide impetus for muscle tone that keeps the body energetic and upright. Without proper integration, these sensations are often lost, leaving children with low muscle tone. A lot of effort is needed to keep the head upright, and children often have to prop their heads up on their hands. They will also often lean against walls or other children. Poor coordination is another symptom of poor sensory processing. Loss of balance and stumbling is a common sight, and children can even fall out of their seats. Clumsy movements are often caused by poor body and gravity sensation processing. In school, children will often mask embarrassment by being clownish, which has the added benefit of peer approval for being funny.

Conceptual learning in school relies on complex sensory integration abilities. Learning disorders are a very common sign of sensory integration disorder. This is because primitive body-centered functions serve as building blocks on which complex cognitive and social skills can be scaffolded. This view supports a basic premise of the sensory integration therapy: that by enhancing lower-level functions related to the

proximal senses, one might have a positive influence on higher-level conceptual organization.

On the next pages are checklists indicating some possible sensory integration problems. One is for the vestibular system, the other for the proprioceptive system. After assessing each child for both sensory systems, notice which, if either, your client tends have the most difficulty. Then assess which types of movement interventions will be most helpful within the context of a dance therapy session with that particular child.

Indicators of Possible Vestibular Sensory Integration Problems

____Becomes overly excited or anxious during movement play

____ Unconsciously rocks during other activities (meals, watching TV, in class)

____Craves movement activities

____Low muscle tone or sits with rigidity

____Becomes anxious or distressed when feet leave the ground

____Slouches in chairs, falls out of chairs

____Excessive movements or spins self frequently throughout day

____Poor balance or clumsiness; poorly coordinated movements

____Avoids movement such as climbing or jumping; plays alone on the playground equipment

____Under or overly active

____Short attention span

____Difficulty sequencing actions

____Gets car sick or is nauseated with movement

____Jumps without lifting feet from the floor/dislikes the swimming pool

____Dislikes activities when head is upside down (roughhousing, somersaults)

____Poor endurance; tires easily

(Compiled from Gibbons, C., Morroni, K., and Dunn, W.)

Indicators of Possible Proprioceptive Integration Problems

____Uses inadequate or excessive use of force (clapping, writing, playing with toys)

____Seems unaware of movements of the body

____Poor shoulder stability when writing or when on hands and knees

____Difficulty sitting still

____Seeks support externally from the environment, such as leaning on walls and people

____Watches hands and feet while moving

____Difficulty standing still in line

____Thinks best when moving around

____May not like to be left alone due to poor spatial awareness

____Squeezes crayon or pencil when writing

____Accidentally breaks toys

____Looks “lost in space”; crashes through other children’s games without noticing

____Doesn’t know what moved; blames the object after falling

____Tires easily, or tires before game is complete

(Compiled from Gibbons, C., Morroni, K., and Dunn, W.)

Reminders

Clients will naturally seek out the types movement their nervous systems need. After an initial assessment, watch what types of movements they tend to enjoy and see if you can gear sessions towards their sensory integration needs. The challenge is to make sure that they are not simply repeating the activity over and over without their nervous systems integrating and processing the sensory information. The goal is to help the child make adaptive responses to movement challenges.

An adaptive response is a purposeful, goal-directed response to a sensory experience. It allows for challenges to be mastered, after which the new information can be used to organize even more complex behaviors for more challenging goals

Remember that different children have different sensory integration needs; they can be as varied as our DNA. One type of activity may calm a hyperresponsive client and rev up a hyporesponsive one. You will need to observe how they react to these movement activities/interventions initially and tailor them to each individual client.

Be sure to modify the intensity and difficulty of movement to their historical and developmental age as well. Sometimes it may be helpful to encourage a hyperresponsive child to try something within his/her capabilities, but beyond his/ her comfort zone with regard to sensory integration. The movement should be challenging enough to be fun or satisfying for them, but it is important that your clients recognize that what they do "works". As your clients produce adaptive and integrated responses to physical challenges, their sensory integration capacities increase, allowing them to attempt more complex challenges.

Modify movement activities to accommodate thematic material arising naturally in sessions. Sensory stimulation is much easier for children to integrate if it is meaningful to them, and allows you to support the psychotherapeutic process. Bouncing on a therapy ball will stimulate the vestibular system regardless of whether you are "jumping to the moon" or "riding on a horse's back."

Because sensory integration tends to excite the nervous system, children need time to quiet it back down at the end of a session in order to better integrate their sensory experiences. Slower, perhaps more resistive movement can be helpful. Blankets or sleeping bags are good for containment, low lights, and maybe soft music. Pressing a therapy ball or big pillows down on their backs and legs while lying down on their stomachs might feel good to them, while at the same time organizing and quieting their nervous systems. The child should leave the session in a calm and alert state.

Vestibular System Stimulation

The vestibular system senses changes in direction, momentum, and gravity. Being one of the first senses to develop, the vestibular system is integral in laying a foundation for visual, auditory and motor skills. These in turn prepare children for self-care, play, social skills, and educational learning.

Be creative with your knowledge of movement and adjust activities to accommodate both your clients' psychological processes, as well as fulfilling their vestibular system needs. Vestibular system stimulation most typically exists within the Indulging side of the Kestenberg Movement Profile's (KMP) Tension-Flow rhythms. Tension-Flow rhythms are about attaining satisfaction of our biological needs, and about

the psychological drives of safety and danger. The indulging qualities (as opposed to fighting) tend to be less assertive and more soothing and rhythmic. In particular, you should try to use sucking, swaying, or jumping rhythms (their opposites are biting, surging, and ramming rhythms). Spinning and rolling movements naturally spreads the body out in horizontal space due to centrifugal force. This could be described as releasing some of one's ego outward, which is similar to spiritual expression (sufi dancing often utilizes circular spinning). It is important to remember our natural tendency to "hold ourselves together" at these times, however. Your clients may be experiencing some combination of these two experiences.

In Body-Mind Centering terms, these vestibular stimulation movements tend to be more focused on the earlier Basic Neurological Actions. Some examples are spinal pushes and reaches from the head and pelvic floor, and homologous pushes and reaches of the arms and legs. Similar to the KMP tension-flow rhythms, these first basic actions are about reaching for what you want and pushing away what you don't. While doing these exercises, remember that your client's head (and thus inner ear) must be moving through space and changing directions to trigger a vestibular sensory response.

While working on vestibular stimulation remember that high stimulation will sometimes trigger nausea and/or dizziness (especially in a hyperresponsive child). Be sure to watch for any changes in skin tone, respiration or behavior which indicate that they have had enough vestibular stimulation. Definitely stop when the child indicates verbally or otherwise that he or she has had enough. You may need to be the one to decide when they have had enough stimulation, as their nervous systems may not warn them of too much stimulation (especially with a hyporesponisive child). Never stay on

spinning activities for more than five minuets, and never maintain a high rate of speed. Not only can high speeds present a risk of injury, but it will also be more difficult for them to process and integrate. If a child becomes over stimulated, have him/her sit or lie down and do deep pressure or resistance (both proprioceptive) activities. Small sips of cold water can also be calming and reorganizing.

Vestibular Activities

- Bouncing on pillows or on a therapy ball
- Spinning in circles (perhaps with scarves or pinwheels)
- Rocking forward and back along the spine while curled up in a ball on the floor
- Roll across floor with hands over head or at sides
- Bounce up and down like popcorn while sitting on the floor or in a chair
- On hands and knees, rock back and forth (like a puppy)
- Swaying side to side in the vertical plane (like a tree in the wind)
- Play Ring Around the Rosie
- Playground activities: swings (regular or tire) or ride the merry-go-round
- Be an Airplane/Superman. Lying face down on the floor, extend arms, legs, trunk, and head into the air (don't forget to breathe!)
- Bounce on a trampoline
- Dance in any way that uses acceleration and deceleration (time), and changes of direction (space), or changes in level
- Do jumping jacks
- Play Red Light Green Light

Proprioceptive System Stimulation

The proprioceptive receptors are located in the muscles, tendons, and joints. They feed the proprioceptive system sensory information about how the body parts are in relationship to each other, and about the body's movement through space. Proprioceptive awareness promotes a more thorough body scheme, which allows for better motor planning and spatial relations.

While stimulating the proprioceptive system it helps to remember that weighted, heavy work provides a lot of feedback for the body about how, where, and at what speed its parts are working in relationship to each other. The more opposing muscles have to work, the more likely the proprioceptive system will register it. Hanging from bars and stretching also provides good proprioceptive stimulation.

Activities for proprioceptive stimulation are assembled on the fighting side of Kestenberg Movement Profile's tension-flow rhythms. Most often these movement activities will be in the strain/release, surging/birthing, and spurting/ramming rhythms. They often require extremely strong, direct efforts.

In Body-Mind Centering theory these movements require very strong pushes initiating from all of the endpoints (hands, feet, head, pelvic floor). It doesn't really matter if you encourage homologous, homolateral, or contralateral movement, as long as it is STRONG!

Proprioceptive Activities

- Shake out the "Wiggles" from each body part while the rest stays quiet
- Do the Wheelbarrow Walk
- Push on the walls to "make the room bigger" or "push down the walls" with hands, back, and feet
- Climb a "mountain" by securely attaching a piece of rope to a stationary place and pulling yourselves "up." Go forward, backwards, on your belly, sitting, etc
- Pull and push with stretchy cloth
- Lift heavy objects
- Do Chair or Floor Push-Ups by sitting in chair and raising your bottom off the seat by holding the edge of the seat and pushing down
- Row a Boat by sitting on the ground facing each other, feet on the floor, grasp wrists or elbows and rock back and forth. See how long you can go
- Get from point A to B while legs are on a therapy ball, hands on the ground
- Swing on the Monkey Bars
- Do the Bear Walk on hands and feet.

Findings and Discussion

Findings

This section reviews the qualitative content gathered by the pre-study questionnaire, the subject's post-session journal entries, and the post-study interview.

Pre-Study Questionnaire

The pre-study questionnaire collected some background information about the subject, as well as assessed her baseline knowledge of sensory integration. She graduated with a Master of Arts in Somatic Psychology: dance/movement therapy in 1998. She has worked as a school-based and out-patient therapist for elementary and adolescent children for the past four years. She includes experiential and play therapy, sand tray work in her dance therapy practice. Her approach is solution focused and "person centered."

She had been using a number of movement interventions before implementing the manual's suggestions for increased sensory integration. Many of them already appear to stimulate both proprioceptive and vestibular systems. These include: head-to-toe body part warm-ups, movement-plus-name check-ins, lead-and-follow games, red light green light, move-and-stop impulse control activities, mirroring activities, "slow races," boundary activities with hoola hoops, and progressive relaxation.

The subject expressed her satisfaction with using such movement interventions with clients who have ADD and ADHD. She remarked that their behavior is better when they are moving their bodies, and that school can be difficult for her clients with so much time spent sitting still at desks. She has other clients, however, who don't want to move.

They would rather play board games or use the sand-tray. She also noted that her office space is small for movement activities, and that her clients are easily distracted by games and toys so nearby. Finally, she stated that she hadn't had any exposure to sensory integration theory or practice before reading the Sensory Integration Movement Manual for Dance Therapist, and thus hadn't applied any of it in her sessions with clients.

Post-Session Journal Entries

The subject entered a review of each session utilizing the sensory integration movement interventions in a journal provided for her. Individual entries were about a page and a half each. They outlined the movement interventions she attempted, the movement interventions completed, her clients responses to them, along with the process and content in each session.

Qualitative Post-Study Interview

This one-hour interview took place in the researcher's home office where the session could be recorded on a computer. The subject read from her journal entries and expanded on some of them when she thought of additional relevant information. She answered the researcher's questions emerging from the content of the discussion, and also answered protocol questions not already covered in the journal or emergent questioning.

This subject felt the explanation of sensory integration was very good, and she shared some of it with one of her client's classroom teacher as a tool to relay the information. She felt there were ample movement interventions from which to choose in each group (vestibular and proprioceptive). She did state that she would like to re-read

the manual because she has to work hard to understand "scientific" material. Another reading would help her to more thoroughly understand why each movement intervention was helpful stimulation for a particular sensory system.

She selected two clients who she felt might have sensory integration problems based on the Indicators of Possible Sensory Integration Problems checklists. Both were male. Joe was seven years old, and Tony was nine. Joe had severe ADHD (not otherwise specified), including impulse control problems and difficulty appropriately expressing his feelings. Tony had Adjustment Disorder, (not otherwise specified), with impulse control problems and boundary issues.

The therapist felt quite comfortable guiding the movement interventions. She was confident of her ability to modify the movement interventions to blend with the dance therapy process. "I'll change them as per session. If Tree in the Wind fits (the client's) exploration we'll do that. But if it becomes seaweed, or spaghetti noodles, then whatever needs to change I'll change for that child." She and her clients were already comfortable doing movement in their therapy sessions. Her clients liked trying the new movement challenges. According to her report they both felt comfortable choosing to discontinue movement interventions that didn't appeal to them, and to stick with the ones that did. Both clients persisted with movements stimulating the systems that had the most negative symptoms on their Indicators of Possible Sensory Integration Problems checklists.

Both clients had at least a third of the symptoms checked-off on the Possible Vestibular Sensory Integration Problems checklist. Neither, however, was interested in spinning, which is a common type of vestibular stimulation. The therapist reported that she'd presented the spinning activity by using scarves. She thought perhaps this was too

"girly" for them. During the interview she thought of some appropriate presentation alternatives to encourage spinning as a movement intervention which would be more appealing to them. It is possible, however, neither needed rotatory vestibular stimulation, or that due to poor vestibular stimulation processing both were uncomfortable with spinning.

The therapist introduced the movement interventions according to the structure of the dance therapy session. She organizes her sessions in three parts, beginning, middle, and ending. The beginning involves bringing clients from their school building out to a temporary office space near the school. While outside she typically used movement interventions requiring a large use of space, such as Red Light Green Light, or her adaptation of it, Move and Freeze. She also utilized the playground structures because they were on the way to her office. These included the Monkey Bars (proprioceptive stimulation) and Swings (vestibular stimulation). While they were on these structures she used the time to check in with them about how they were doing at home and in the classroom.

During the middle section of her sessions she allowed the clients to choose what they wanted to do. She observed their movement during this time. She either encouraged any movements resembling one of sensory activities, or just mentally noted movements resembling them if she felt she was going to interrupt the flow of the session by interfering.

The ending sections of session were used to try a few last sensory stimulation activities and get ready to return to the classroom. This often included Red Light Green Light on the way back in. This seemed to be especially stimulating to Joe, and she had to

do some breathing exercises and Wind in the Trees outside the classroom door to get him to calm down. She didn't follow the manual's recommendation of pointedly calming her clients back down, but she reported that they were generally calm and alert upon returning to class. Joe's Red Light Green Light trip back to class appeared to be the only exception of calmness at the end of the sessions.

The subject expressed her enthusiasm about using the movement interventions with children with impulse control issues and attention deficit problems. She was happy to see that many of the suggested interventions were similar to ones she had already been using. She felt the Monkey Bars and "Rowing the Boat" were the most helpful "new" interventions for her two clients. Below are descriptions of how some of the movement interventions were utilized with both clients.

Joe had seven vestibular symptoms and four proprioceptive symptoms. In the first session with Joe, the therapist did Red Light Green Light, and the Wiggles activity as warm-ups. He chose to play blocks for a while, and then moved on to the "Thinking, Feeling, and Doing Game." She remarked that he was unusually calm and focused during the length of the game. She attributed this to the sensory stimulation activities done prior to, and during, the game (she noticed him pressing on the floor with his hands, so they did Floor Push-Ups and Popcorn during game). After that they did they did "Rowing the Boat." Again she was impressed with the length of time he remained calm and focused during the activity. "His face relaxed. His eyes got calm. Usually he… wants to change activities right away, … but he stayed with the activity for a long time."

Tony had seven vestibular symptoms and eight proprioceptive symptoms. They started both sessions on the Monkey Bars. He was extremely enthusiastic about

them, and was motivated to go from one end of the structure to the other, with 3-5 different elements, without falling. Despite the fact that she was feeling cold, she allowed him to stay with the activity (for twenty minutes). “It felt like he was getting a lot out of it, so I let him stay with it.” Once inside he got in to the “stretch bags” (Lycra bags with a hole large enough to crawl into the bag), which provide proprioceptive stimulation as children press the cloth outward. He went into deep imaginary play (as a caterpillar turning into a great moth), which was apparently very satisfying for him as demonstrated by his statement “I’m not finished yet” when he was informed it was time to go. The subject hypothesized that the deep proprioceptive stimulation while on the Monkey Bars somehow supported his remarkable play in the stretch bags.

In general, the subject felt that positive changes of behavior resulted in both clients as a result of the sensory integration movement interventions. She felt Tony was able to maintain calm yet alert state, which facilitated his exploration of appropriate boundaries. Joe was able to sustain his attention on activities (both moving and still) for much longer than usual. One unexpected benefit of the manual for the subject was the idea of using the playground as a therapeutic environment. Because of typically sized offices, therapists often feel stilted in their ability to use large movement in therapy sessions. As the therapist said, “I’ve never thought of playground equipment activities as therapeutic, emotionally or physically. I always just thought of it as play. So that was really eye opening and exciting for me. There is so much freedom in those activities.”

Limitations

A number of limitations should be considered in the conclusions drawn in this case study. These include: interviewer skill, subject loyalty, length of study, and sample size.

The interview was the first qualitative interview conducted by the author. This may have resulted in incomplete data collection. Subject loyalty is also of concern. The subject chosen for this study graduated from Naropa some years ahead of the author. The fact that the author is a Naropa student may have favorably skewed the subject's responses due to school loyalty.

A lack of feedback from other adults in the children's daily lives was also a limitation. Input from teachers and parents would have provided richer information about whether the interventions were effective beyond the therapy sessions.

The study was completed in a very short period of time. It used only one subject, who was able to apply the manual to only two clients, in two sessions each. Due to these factors, study the results are not representative of the general dance therapist population. Different results could occur with a larger subject pool, and more time to apply the manual's movement interventions.

The subject felt it was important to try as many of the movement interventions with both of her clients as possible, so as to be able to report as much information for this study. She didn't feel she had enough time to attune to her clients process before blending in the movement interventions. Thus her sessions were somewhat atypical in that she was prescribing movement for them to try.

Normally this would be appropriate to ascertain the range of a client's movement preferences. Unfortunately, her reported sessions did not reflect her more typical sessions because she tried to fit so many into each session. She also wished she had felt less pressure so she could ask how each movement intervention felt to her clients, a question she would more normally ask.

Conclusion

Implications for Future Study

It would be interesting to study the effects of the implementation of this manual and its movement interventions with more subjects. Much could be learned about how different therapists tailor the interventions, and if they all feel it enhances their dance therapy sessions.

Studying its effects over an extended period of time would shed light on the effect of this manual on clients' sensory integration abilities. Occupational therapy emphasizes that sensory integration therapy should last at least six months to a years to reap any lasting benefit. The subject in this case study expressed a wish to observe her clients in the classroom after sessions involving sensory integration stimulation to see its effect on their attention span, impulse control, and movement quality immediately after sessions.

A comparative study might be interesting to explore the effects of the incorporation of sensory integration stimulation in dance therapy with children diagnosed with Sensory Integration Disorder as compared to those in dance therapy without the incorporation of sensory integration stimulation.

Conclusion

Dance therapy, like sensory integration therapy, is a relatively new field of study and practice. Both approaches offer new ways to consider and treat children who are having difficulties. Because both are body-centered modalities, they seem very well suited to inform and support each other's progress. Dance therapy can use sensory integration theory to support its own, as well as utilize some of its movement

interventions to better serve its child clients with a more well-rounded, multi-modal approach.

This doesn't demand that the dance therapist go back to school for an extended period of time. Much sensory integration stimulation already takes place in dance therapy sessions because their clients seek stimulation naturally. Dance therapists just don't recognize that their own dance therapy positively effects their clients' sensory integrative abilities.

This manual is an attempt to educate dance therapists about sensory integration, and in particular about the vestibular and proprioceptive sense systems. With increased awareness and understanding of sensory integration disorder, perhaps they will be able to further refine their own interventions, as well as increase their perspective about the needs of their clients.

This study's results suggested that utilizing sensory integration theory and techniques can aid dance therapists in supporting their clients towards meeting their treatment goals. This subject in particular was excited about the information and wanted to learn more. Increasing our knowledge of our capabilities as therapists can only increase our ability to support our clients to become more integrated, physically, socially, emotionally, and spiritually.

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Appendix

Pre-Test

What training have you had in dance therapy and elementary aged clients?

What kind of movement interventions have you been doing with your clients?

In what ways have you been pleased or disappointed with their use?

What do you know about sensory integration disorder?

How has that informed your approach to therapy?

What other approaches of therapy have you used?

Post-Study Protocol Questions

Which interventions did you utilize from the manual and why did you choose them?

How did you implement the interventions within the context of a dance therapy session?

In what ways, if any, did you modify the movement interventions to match the emotional content within sessions?

How did the clients respond to the interventions?

Would you use the interventions again? Why or why not?

How would you change them?

How well was the psychological content of the sessions maintained as you utilized the movement interventions?

How useful did you find the explanations of Sensory Integration Disorder?

How broad did you find the range of movement interventions from which to choose?

What, if anything, did you feel was especially helpful from this manual?

What, if anything, did you feel was unhelpful in this manual?

How confident did you feel in choosing movement interventions appropriate to your clients' sensory needs?

How confident did you feel in choosing movement interventions appropriate to the psychological content of each session?

How did your clients respond to the movement interventions?

How would you generally describe your clients' state as they left their session?

How would you anticipate your sessions going if you had more exposure/experience with this material?

How would your sessions have gone differently without your understanding of sensory integration and its related movement interventions?

What, if any, changes in behavior did you notice in your clients when using the movement interventions from this manual as compared to previous sessions.

Informed Consent for Participation

I, _____, hereby give consent to participate voluntarily in the sensory integration/dance therapy study as outlined below.

_____I understand that I will facilitate movement interventions to be used for educational purposes. These interventions will include occupational therapy techniques in conjunction with dance therapy techniques.

_____I understand that Sarah Cleary is a graduate student from Naropa University in Boulder, Colorado. I understand that this material will be presented in her master's thesis, and that I will be able to read this thesis upon completion if I desire to do so.

_____ I understand that this study will occur over two therapy sessions which will be 45 minuets in length with two different clients. It will include a pre-study questionnaire, post-session journaling, and a post-study interview.

_____I understand that the purpose of this study will be to learn how the combination of therapies can help me to support my clients' achievement of their treatment goals.

_____I understand that some movement interventions may increase some children's level of agitation or hyperresponsivity, which may increase physical safety concerns.

_____I understand that Ms. Cleary will take every precaution to ensure that my identity will be protected and confidentiality maintained.

_____ _____

Subject Date

		IndulgingElements		**Fighting Elements**	
Effort Factors					
Flow Effort		Free Flow		Bound Flow	
Space Effort		Indirect Space		Direct Space	
Weight Effort		Light Weight		Strong Weight	
Time Effort		Decelerating Time		Accelerating Time	
Tension-Flow Rhythms		**IndulgingElements**		**Fighting Elements**	
Satisfaction of	Oral	Sucking		Biting	
biological needs,	Anal	Twisting		Strain Release	
psychological	Urethral	Running/Drifting		Stop/Start	
drives,	Inner Genital	Swaying		Surging/Birthing	
safety and danger	Outer Genital	Jumping		Spurting/Ramming	
Shape-Flow		**Growing**		**Shrinking**	
Reaction to global	Bipolar	Widening		Narrowing	
environment,		Lengthening		Shortening	
pleasure/		Bulging		Hollowing	
displeasure					
Shape-Flow		**Growing**		**Shrinking**	
Reaction to specific	Unipolar	Widening Left		Widening Right	
stimuli,		Lengthening Up		Shortening Up	
Attraction and		Lengthening Down		Shortening Down	
repulsion,		Bulging Forward		Hollowing Forward	
		Bulging Backward		HollowingBackward	

Shaping in Planes		**Growing**		**Shrinking**	
Advanced level of	Space/Horizontal	Spreading		Enclosing	
interpersonal	Weight/Vertical	Ascending		Descending	
communication	Time/Sagittal	Advancing		Retreating	

Basic Neurological Actions

Bonnie Bainbridge Cohen, (1993), Sensing, feeling, and action. Pp. 101-107.

Figures for Combining Therapies

More figures