

The Dancing Brain: Attention, Cognition, and Somatic Movement

Hiie Saumaa, PhD

For a decade since 2008, I was teaching academic writing and literature courses at Columbia University in New York City. My first-year students, most of them away from their homes and families for an extended period for the first time in their lives, were getting used to their weekly schedule of going from one lecture and seminar to the next. In most of these courses, the students were asked to perform similar kinds of cognitive tasks for hours—listening, paying attention, comprehending written and spoken materials, writing, and discussing texts. Not surprisingly, their attention and energy would start to lag at some point during the two-hour sessions.

I decided to experiment with bringing movement into my academic classes, to help the students feel more energized and able to pay attention after prolonged periods of listening and reading. Since I teach dance, mindfulness, and conditioning classes, incorporating embodied activities felt natural. I started to include activities in which the students had to stand up and move about in the space. For example, as we were reading Aeschylus' *Oresteia* and discussing the role of the chorus in ancient Greek tragedies, I divided the students into two groups and asked each group to prepare and perform a section where the chorus speaks. I asked them to not just recite the text, but to put the words and the intention behind the words into movement. "How would the chorus move on the stage?" I asked.

At other times, I would include movement for movement's sake: the energy in the classroom always felt different after 30 squats! In some sessions, I would demonstrate a couple of gentle stretches or invited the student athletes in the group to lead a few minutes of stretching. In other classes, we would stand up and shake the arms, the torso, and the legs for a few minutes. Immediately there was more energy coursing through the body. Sometimes we would massage our head for a couple of minutes. These brief rituals of movement and self-care added liveliness and a sense of community and helped the students, and me, destress and refocus.

What happens in the brain when we move? Does movement affect mental abilities? How? How does movement, such as dancing, impact how we sense and describe our thoughts? What kinds of cognitive abilities do we employ and enhance in

movement and dance classes? These questions are gaining the attention of scholars and movement practitioners alike. In what follows, I discuss how the physical practices of dance and somatic movement engage mental awareness. By somatics and somatic movement, I refer to bodily awareness practices that teach practitioners how to notice subtle physical sensations, connect to the inner realm through movement, and make physical adjustments that give space for more ease, expansion, release, pleasure, and alignment in the body.^{1,2} In somatic movement practices, the mind's eye is active and connected to the embodied experience: it travels inside the body and notices or "reads" physical sensations and attends to images, insights, and words that might surface while we dance or move. I end by discussing a philosophical approach that brings ideas from yoga and acupuncture to bear upon understanding how we think.

Movement and the Mind

The impact of movement on the brain and cognitive functioning has received considerable attention.³⁻⁵ Clinical neuropsychologist Paul D. Nussbaum has noted, "Humans need to move, and research has underscored the general negative health outcomes of sedentary behavior. This is also true for the human brain (remember, the brain demands 25 percent of blood from each heartbeat), where research suggests a causal effect of movement to enhanced cognition and volumetric changes in the hippocampus."⁶ Nussbaum underlines five behaviors that foster brain health: "Walk a mile daily at a brisk pace; engage in aerobic exercise several times a week; dance more regularly; reduce time spent sitting and in sedentary behavior; stretch, consider yoga, and engage in healthy weight lifting."

Marcus Conyers and Donna Wilson, authors and experts in brain-based teaching, emphasize that exercise strengthens brain areas associated with executive functions that support higher order thinking, memory, and learning. They argue that the active body and improved cognitive abilities are interlinked: "Interactions of thinking, feeling, and physicality can

enhance the development of new knowledge and skills.”⁷ They note, “Exercise has been shown to enhance both neurogenesis (the creation of new brain cells in regions of the brain associated with higher-order thinking and recall) and experience-dependent synaptogenesis (the formation of synaptic connections between neurons in response to learning and sensory input from the environment).”

In a special issue on dance and neuroscience, Dee Reynolds, Corinne Jola, and Frank E. Pollick show how research on dance can enhance knowledge on cognition, memory, and attention. They point out that cognitive neuroscience can address on a neuronal level some questions that are central to research on the arts: “Scholars have long been fascinated by the thought processes of artists and also by questions of how we respond to art in its different forms [...]. It is now possible to explore the neuronal processes in the brains of those who create, perform, and watch dance, and also to identify neuronal evidence for dancers’ expertise.”⁸ Conducting research on what happens in people’s brains as they watch dance can offer insights into the functioning of mirror neurons and kinesthetic empathy. Kinesthetic empathy refers to the idea that people who watch dance and movement can feel in their own body the effects of the movements that the performers are executing. As scholar Susan Pashman has put it, there is a “felt resonance between internal processes of both dancer and dance watcher.”⁹ This resonance or felt bodily empathy is stronger if the observer is able to imagine performing the movements of the dancer him/herself or has had previous experience with similar movements.

Scholars have explored how dance can help people recover after surviving a central nervous system injury, such as stroke, spinal cord injury, Parkinson’s disease, multiple sclerosis, cerebral palsy, traumatic brain injury, or acquired or genetic conditions. Studies show that dance can stimulate neuromotor plasticity in people who have undergone a central nervous system injury or have difficulties in moving. Sara Houston has argued that dancing can have rehabilitative effects on people who have mobility problems, such as people with Parkinson’s disease.¹⁰ Lise C. Worthen-Chaudhari has claimed that exploring creative movement in a rehabilitation setting can “potentially shift attentional focus in positive ways for people coping with recent, life-changing injuries.”¹¹ She notes that “therapy protocols employing creative process, imagery analogies and gaming paradigms have the potential to deliver knowledge implicitly, meaning that the learner is guided to learn for him or herself without following explicitly directions from another person. For movement recovery among people living with neurologic injury [...] implicit training models sometimes result in greater learning effects than explicit learning models and appear to be vitally important in particular for training of movement skill.”

The Attentive Mind in Somatics Classes

Following choreographic sequences, finding the rhythm, moving in different directions, and coordinating the body parts

are not easy tasks. Professional dancers and students of dance techniques have to pay close attention to comprehend the choreographic material, embody it in their own physicality, memorize long movement sequences, and add their own expressivity. Cynthia Meyers, professor, author, and a former dancer, states:

I was a bookish, verbally advanced child with no apparent athletic skills—could never swim across the pool or run a lap. But at age 15 I discovered dance as one of the most cognitively challenging things I had ever tried. Watching a movement and then trying to replicate it required a lot of cognitive processing: where was the arm, to the side or the front? How fast did it move? In what rhythm? How many times? In what relation to the torso? With what shape and line? With what relationship to the music? Because dance uses both space and time, it is cognitively challenging—a dancer must take in lots of information and sort it and then translate it into her own body. Because of the cognitive challenges, dance is intellectually stimulating too.

Somatic dance reduces some of these challenges. In somatic dance, the focus is on the individual’s personal sensations of being in movement and on connecting to the body. Figuring out precisely how the instructor moves, mastering choreographic patterns, and preparing for stage performance are not essential. Somatic dance practices often rely on movement improvisations, and participants are encouraged to adjust movements and move in the way that makes them feel good. However, cognitive abilities are activated in somatic dance practices as well. Some somatic dance methods such as Nia dance or SuryaSoul Soma© employ simple choreographic sequences and add free dance: even relatively simple steps—given by an instructor or self-generated—are asking for coordination, an inner organization of movement, and the ability to move through the space with awareness of other moving bodies.

One important way in which we engage the mind in somatics classes is through the use of what I call the “mind’s eye.” Employing the mind’s eye means to direct awareness to a certain body part from the inside. We use the mind’s eye when we do a “body scan,” widely practiced in meditative, mindful, and somatic methods. Lying down on a mat or in a seated position, practitioners move the attention to different parts of the body. “Become aware of your toes, the soles of the feet, the heels, the ankles, the shins, the calves, the thighs. What do you notice in these parts of the body? Move the attention to the belly, the low back, the chest, the middle back ...,” I might tell the practitioners. All areas of the body can be evoked in a body scan. By going through different parts of the body, we learn to notice sensations—such as tightness, ease, comfort, weight, and heat, among others—and learn to release tension and undo muscular holding patterns.

A similar body scan can be performed in movement. In somatic dance practices such as Nia dance—a method that combines easy-to-follow choreography and dance improvisation—participants are guided to move their attention to different

areas of the body and notice, nonjudgmentally, what sensations are present as they dance at different speeds and planes of movement and with varying degrees of intensity. Allowing mental awareness to move around in the body helps us stay in the present moment and notice the continuous unfolding effects of movement on the body, emotions, and the imagination.

In my somatic strength training and stretching classes, employing mental capacities is an integral part of the class: out of the plethora of cognitive tasks that the mind is capable of performing, I call on the capacities of paying attention, observing, noticing, and imagining. Executing biceps curls with a TheraBand® or dumbbells, I invite the participants to imagine the position of their bones. The humerus bone is staying static while the ulna and the radius and the bones of the hand are in movement; the biceps muscles glide and contract over the humerus, upward toward the shoulder. Lying on the ground with the back on the mat and the knees bent, heels relaxed, thighs softening toward the torso, I ask the participants to imagine the shape of the sacrum, to feel the sturdy dense nature of this bony area, and the softness of the muscles over it. We then contract the lower abdominal muscles and drag the weight of the sacrum and the bones and the muscles of the legs closer to the torso, relaxing and widening the low back muscles. We then place the pelvis gently back on the ground and repeat the exercise. I might ask the participants to notice what the contraction feels like, and where they sense ease, comfort, and pleasure, while doing this exercise. Maybe they notice tightness or ease in parts of the body that are not actively contracting or releasing in this exercise? How do their neck and the upper back feel; what is happening around the shoulder blades? Is it possible to relax into the support of the earth through the back of the skull and the upper back and torso while they are performing the lower abdominal crunches?

Somatic dance and movement classes have the potential to enhance practitioners' imagination. We might explore an image, a feeling, a dream, a desire, or a traumatic experience that arises from the embodied experience. Doing side lateral lifts with a TheraBand or dumbbells—lifting slightly bent arms to the sides of the body in a standing or a seated position—I ask participants to notice that moving the arms to the side is a horizontal movement. In this movement, we are tracing the horizon. I might add, “Feel free to close your eyes if you'd like. Imagine that your sight can expand from this present moment to the future. What do you see on the horizon? What is ‘almost here,’ beckoning?” In the Tamalpa Life/Art practice, dancers might be exploring the question of “if my spine could speak, what would it say?” In a JourneyDance™ class, which includes elements of shamanic dances, participants might imagine throwing habits, behaviors, and patterns of thinking that no longer serve them into an imaginary fire. Afterward, they might sense what it would feel like to move about without the weight of these past habits or patterns of thinking. In a creative movement or an improvisation class, imagination could be the starting point for movement. “Imagine we are walking about in Luxembourg Gardens in Paris. What and who do you see? Have an imaginary interaction with some element of nature or the people you see,” I might tell the participants.

In a somatic, mindful movement class, the mind is not inactive during the exercises, nor is it multitasking and combining movement with an activity that does not pertain to the movement experience, such as watching a movie or a YouTube clip or reading or planning a work assignment. Rather, we invite the mind to stay *with* the body, to notice what is happening in the body in the present moment as we move or lie or stand still. We learn to “see” or “read” inwardly the parts and layers of the body that we cannot necessarily see or touch with ease such as the bones or the muscles in the middle of the back or the inner organs. In the words of Lynn Matluck Brooks, a participant in my somatic strength training classes, “I do feel that I understand my body from the inside when I take your class. I'm putting together my body's picture (how muscles/bones connect up), its feeling-state, its capacities at this point in my life, its connections to my mental condition.” We learn what it feels like to distinguish between the bones and the muscles, or notice where in the body we feel lightness, expansion, and release. We notice what images or words spring up in our consciousness as we move, what new insights arrive, how our mental states might shift throughout the movement experience. These explorations help us move more freely and make adjustments for a better alignment, better posture, and as a consequence, may help us release aches and discomfort that result from the compromised posture or unbalanced use of the skeletal muscles.

Yoga for the Mind[©]

Noticing physical sensations through body scans and by activating the mind's eye takes practice. It might be difficult to move from states of thinking to states of sensing—to “get out of the head and into the body,” as the saying goes. When we worry about getting the movements “right” in a dance class or are concerned about how we look in the mirror when we move or have a thought that constantly cycles around in the mind, it is challenging to feel what is happening in the body and to discern thoughts from sensations. Somatic introspection—noticing physical sensations and how we feel in the body—is often blocked by our mental activity. Inviting the mind away from thoughts and toward noticing what is happening in the body can be difficult or new. It is useful to stop and ask, “What do I think right now? What do I feel physically right now?”

Yoga for the Mind, a practice created by philosophers Michael Eskin and Kathrin Stengel, offers a unique approach that can help us discern between thoughts and sensations and understand how we use the mind.¹² This method, outlined in the book by the same title, combines elements from yoga, acupuncture, and philosophical thinking. When we dance or practice yoga, we learn to feel the body from within: doing Yoga for the Mind, the authors suggest, we learn to get to know the mind better and “feel” it from within. Once we understand how we use the mind—for example, we learn to recognize the moments when we start to worry or analyze or criticize

ourselves or others—we learn how to invite the mind to stay nonjudgmental and open to noticing our physical sensations and how we feel in the body.

The authors propose that “philosophical thinking is to the mind what yoga (as widely understood) is to the body.” When one practices this method, one takes the mind off of practical, everyday mental assignments such as thinking about goals and plans or engaging in conversations, analysis, and calculations for the future. “You put yourself in an observer mode. You become more aware of the linguistic construction that creates reality for you. You learn to distinguish between certain alignments of words and thoughts that are beneficial for you and alignments of words and thoughts that are misalignments, like bodily postures or habitual muscular holding patterns that create tightness, unease, and compromised posture,” Stengel explains.

Yogic practices often refer to the “monkey mind”—mental states where we feel like the mind is “running around” without our conscious direction. This “monkey mind” is often seen as something we need to “harness,” “regulate,” and “control,” for example, through meditation practices. Yoga for the Mind is similarly interested in developing our ability to focus and to experience the mind as balanced, healthy, and at peace. However, instead of “controlling” the mind, Eskin and Stengel highlight the idea that we can learn to understand how our mind works, with compassion. Just as somatic practices teach us a compassionate approach toward the body, this practice teaches us a compassionate, nonjudgmental approach toward the mind.¹³

The authors suggest that this type of healing can be practiced by anybody. According to Stengel, when we practice philosophical thinking, we see the undercurrents of our rationality. Particularly in light of the COVID-19 pandemic, Stengel opines that “uncertainty is our daily bread. We are more and more forced to practice balancing our own thinking.” “If I have a good connection to my mind, I’ll have a better experience in my body,” she notes. For example, understanding and alleviating anxiety involve understanding what thoughts underlie the subsequent emotions that one experiences during anxiety. “Thinking is as complex as the functioning of our body. The chain of thinking is as complex as what is happening in your body every single minute,” she observes.

As the first component, Yoga for the Mind outlines 14 poses or āsanas—not for the body, as in yoga, but for the mind. These mental poses include “slow pose,” “patient pose,” “stepping-back pose,” “suspension pose,” “attention pose,” and “listening pose,” among others. For example, the listening pose focuses the attention on the auditory dimension, such as the sounds, noises, and words coming our way. “It enjoins us, literally, to listen with care to every detail, sound bite, and noise issuing from ourselves and our environment, to tune into our interlocutors’ words, emotions, and needs, rather than hearing the perpetual rumblings of our own minds,” the authors state. We all realize the need to slow down and cultivate openness and the ability to dialogue: the novelty of Yoga for the Mind lies in the goal to cultivate these mental dispositions

as habits, “helping us to make those haphazard, unplanned, unreliable moments of patience, internal slowing down, dialogue, and openness that we all occasionally experience part of a continuous and reliable dispositional pattern, in helping us to translate them into a sustained mental posture that will not only not be at the mercy of the vagaries of mood and circumstance but that will sustain us and keep us on track even in those moments when we might be tempted to fall back on those rut behaviors.”

The second component of Yoga for the Mind looks at mental processes through the analogy of acupuncture, meridians, and acupuncture needles. The authors distinguish five meridians of thought: distinction, perspective, relation, movement, and sense. If one of these gets off balance, we begin to “wobble.” In Yoga for the Mind, along the meridians of thought are the thought points: “Like acupuncture points, through which our psycho-physical energy system can be affected using acupuncture needles, Thought Points are portals through which our mental energy system can be influenced using Thought Needles [pointed philosophical questions].” Stengel recommends taking one “Thought Needle,” a question such as “What is uncertainty?” and start “sketching” your thoughts by writing them down, talking out loud, or speaking to a friend. “What makes something uncertain? What makes something a judgment? What is the difference between a neutral sentence and a sentence that feels like a judgment?”

Yoga for the Mind is an attempt to bring therapeutic philosophical thinking to people from all walks of life. “I feel like Yoga for the Mind makes me feel more awake, alive, more relaxed,” Stengel describes, “You come into a state of contemplative being. You experience your own being in the presence of the ‘now.’ We learn to connect to what is at stake right now—we do not get hooked in the cycles of past memories or emotions about the future that hasn’t even happened yet. When we practice Yoga for the Mind, we learn to release things: it is about the suspension of judgment. We learn to see things as they are: not right, not wrong. We learn to align with what is now,” she adds. This method teaches the practitioners how to observe their thinking in a detached way so that they can see how they think and what their unique being is. “There is light and happiness about being alive. One with life and universe, completely unique,” Stengel describes her feelings after spending time with this practice.

Conclusion

Dance and movement lift the mood, boost confidence, and make us more divergent and creative in our thinking. Engaging in somatic movement practices, participants not only attend to the body, but their cognitive abilities as well. Deep slow breathing, often practiced in somatic movement classes, helps to calm down the onrush of thoughts and reduces stress, overwhelm, and anxiety. Employing the mind to notice what is taking place in the body anchors the mind in the present moment rather than the past or the future. Images and insights that might visit us while we move can refresh the mind and add

another dimension—playful, rejuvenating, or reflective—to the embodied practice. Bringing cognitive awareness to our physical experiences and noticing how movement makes us feel mentally, we can learn how to make adjustments for greater well-being, health, and alignment, in the physical body and in our mindset and thoughts as well. ■

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Hie Saumaa, PhD, is a dance writer, scholar, and somatic movement educator. She is a certified instructor of Nia dance, The BodyLogos Technique, and JourneyDance, and teaches classes and workshops in sensory-based dance modalities, creative movement, expressive arts, mindful strength training, and somatic awareness. Her work explores interconnections between dance, somatics, embodied knowledge, health, creativity, and imagination. In 2018–2019, she was an inaugural fellow at Columbia University's Institute for Ideas and Imagination in Paris, France, and in 2017, she was a fellow at the Dance Division of the New York Public Library for the Performing Arts. She has taught at Columbia University, New York University, the University of Tennessee, Paris College of Art, the Catholic University of Paris, Emlyon Business School, and l'Institut Mines-Télécom. She is currently teaching dance and writing at Columbia's Global Centers in Paris.

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