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The Spatial Ins and Outs of Proprioception

By Jane Swain

Why do classic dance studios have mirrors? In dance classes, students try to imitate the teacher's movements. Some students are able to accurately reproduce the teacher's movements, and some are not. The ones who are not, generally have no idea that they are inaccurate, often because they are not adequately sensing where their body parts are and what their body parts are doing. If these students are made aware that they are inaccurate, then they can check the position of their body parts by looking in the mirror. They can compensate visually.

These dance students are making conscious what is normally unconscious--the dynamic and resting positions of their arms, legs, and spines. For example, we aren't usually aware that we are bending our elbows, we simply bend them, and we aren't usually aware that our elbows are bent to a particular angle. Rudolf Steiner refers to this sense as the sense of self-movement. It is not the ability to move, but rather, the ability to sense our movements and positions of our forearms, fingers, shins, etc. Two medical terms for this sense are kinesthesia and proprioception. They are technically a little different but generally have the same meaning.

If children can't fully sense their movements and positions, they are likely to have poor coordination and move clumsily. They may have difficulty sensing how much force a muscle needs to generate for a particular task. These children tend to break Easter eggs when dying them, or hit a friend too hard and don't mean to, or wind up a ball of yarn too tightly. These children tend to seek out heavy work in which their muscles generate a lot of force, because then they can better feel what their limbs are doing (at an unconscious level).

Our bodies as spaces

The normally unconscious senses of proprioception, touch, and life combine to provide our overall body scheme or body map. Proprioception gives us the positions and movements in space of our body parts in relation to each other. Touch gives us the boundary of our bodies. The sense of life gives us the sense of having contents--of taking up the space inside that boundary. If we don't have a well-defined body scheme, what this means is that we don't fully know our inner spaces, and as we live in the context of our surroundings, then it is hard to know where we are in relationship to the objects and people in the spaces outside us. Poor timing and bumping into people and objects may result. When adolescents are going through large growth spurts or when

people quickly gain or lose weight, they may be awkward for a period of time until their body schemes catch up with their new inner spaces.

Spatial gestures of the threefold human being

Years ago, I learned about Steiner's description of the threefold nature of the human being with the nerve sense system being the seat of thinking, the metabolic limb system the seat of willing, and the rhythmical system the seat of feeling. This three-foldness is present throughout the entire body. However, our thinking has its quarters in the head, our willing dominates in the arms, legs and abdomen, and the rhythmical system is centered in the chest.

In my Spatial Dynamics training with Jaimen McMillan, we explored the spatial gestures of each part. For the nerve sense system, the spatial gesture of the head is to come from the periphery into the point. When we try to grasp someone else's thought, we say, "What's your point?" We talk about our thinking with phrases like, "It came to me out of the blue", or "This idea fell out of the sky." Our heads receive sense impressions from the periphery such as sights, sounds and smells.

The spatial gesture of the metabolic limb system is to ray out--the polar opposite of coming to a point. The bodily fluids, urine, feces, menstrual blood, and semen move out of the body into the periphery. Babies are born and come out into the world. In coordinated movements, the limbs ray out and meet the world. We knock on the door with our knuckles, not with our heads (unless we are a knucklehead). In contra-dances, we link elbows, join hands and stomp our feet, and optimally our heads just sit there--still and quiet--and get carried around, free to receive from the periphery. Unfortunately, sometimes our heads have excessive movement--our heads become limbs--and then we have a harder time in the dance.

The rhythmical system repetitively weaves the two gestures together--come to a point, ray out, come to a point, ray out, etc.--as manifest in the heart beat and in breathing. The rhythmical system separates and holds the two polarities at bay, and there may be unfortunate consequences if this doesn't happen. If the head has the gesture of the limbs, this may be a preparation for attention disorders. If the gesture of the head is in the metabolic limb system, the person may experience muscle cramps in the limbs, constipation, or menstrual disorders. If the gesture of the chest moves into the head, the person may experience a throbbing headache.

Do you get it?

Let us consider proprioception in more detail. A classic indication that children are having difficulty with proprioception is that they "don't get it." Early in my career I

worked on a rehabilitation unit in a hospital as a physical therapist. One time I was teaching a patient's husband how to transfer her from the toilet to her wheelchair. I demonstrated the transfer, and then asked the husband to try it. The husband looked at me with a blank look, and said, "I don't get it. What do I do?" I responded with an equally blank look, as I honestly didn't know what I had done. We are aware of our thoughts, but I wasn't in my head--I was in my limbs. This is an example of Rudolf Steiner's assertion that we are awake in our thinking and asleep in our willing--in our limbs.

My limbs had sensed the patient's muscle tone, and knew when she was ready to begin the transfer. My limbs had sensed what direction she was moving in, and knew how much I needed to guide her. My limbs had sensed how much weight her legs were taking, and knew how much support I needed to give her. The patient and I had been involved in a limb-to-limb type of communication, of which our intellects were not involved. In order to accommodate the husband, I repeated the transfer, this time translating it step-by-step to my intellect and verbally describing it to him, and then he was able to adequately do it.

There were other patients with family members who learned directly from my movements, bypassing their heads. These people did not learn well from verbal cues, in fact verbal cues irritated some of them. These family members had a higher degree of "limb intelligence", i.e., they had more refined proprioception. Their limbs had rayed out and were able to perceive my movements, and they "got it" without needing to compensate with their intellects. They could imitate me limb-to-limb. I didn't fully understand the significance of this until years later when I studied Spatial Dynamics, but at the time I did recognize that if a family member could learn nonverbally, his transfer was usually more skilled and the patient was safer than with those who needed the verbal instruction.

Proprioception involves not only sensing our own movements and positions of our limbs, but also the forms and movements in our environments. In a classroom setting, children with delayed proprioception often have difficulties during transitions such as clean up time, where movements of their classmates can be quite haphazard. If a child's limbs are not raying out sufficiently to perceive the movements in the environment, then he especially may have difficulty following unpredictable movements, and may have a meltdown or other such behavior. Similarly, this child may have difficulties imitating movements of others, and reading nonverbal cues of others. He might "not get it".

Difficulties with proprioception can profoundly affect the soul. Another time, I had an adult stroke patient who had lost proprioception in one leg, but she could move that leg

perfectly well *if* she looked at it and paid full and continuous attention to it. (Remember the mirrors in the dance studios.) She was extremely insecure, insisted that she use a walker, and did everything she could to avoid moving. Her family did not understand why she was so hesitant and anxious. After all, her leg was not paralyzed. However, I explained that her behavior was understandable. Sensorially, she really didn't have a leg to stand on, and compensating with the intellect was exhausting.

The spatial development of proprioception

Proprioception develops over time in the early months and years of life. Newborn babies don't know the positions of their body parts; they hardly even know they have bodies yet! When babies are born, they have no mature coordinated movements. Instead, their movements are dominated by the primitive reflexes. In each one of the primitive reflexes, there is a stimulus and then a particular, predetermined response. Each response strengthens the pattern of moving from the periphery into the point. Spatially, infants are coming from the vastness of the spiritual world (the periphery) into their little tiny physical bodies (the point). The movement gestures of their whole bodies are functioning as one big head, i.e., they come to a point. The primitive reflexes facilitate this spatial migration into their bodies. This is good. However, this is not the end point! They also gradually learn to get back out into the periphery of the earthly world in order to interact with it sufficiently.

Over time, the initial single gesture of the entire body (of coming to a point) is transformed into the three distinct gestures of the threefold human being. The metabolic limb system is liberated from the tyranny of the head and takes up its own gesture of raying out, and the rhythmical system modulates the two polarities. The head retains its initial gesture of coming to a point. *It is the liberation of the limbs from the gesture of the head which is the critical underlying factor for the healthy development of proprioception.*

How does this transformation occur? It can happen naturally as infants, *through their own efforts*, come from the horizontal up into verticality. This process involves lying on the back; rolling to the side, to the tummy and across the room; belly crawling; hands and knees crawling; kneeling; and on up to standing, cruising, and walking. Sublime wisdom is working throughout this developmental sequence. For example, not only are infants learning to reach for a toy while playing on their tummies, their heads are learning to be still and quiet, and they can attend to the toy. Their arms are learning to ray out, and they are developing proprioception. Their rhythmical systems are learning to hold the space between the two, and they don't spit up as much.

How can we help?

Providing infants with the time and space to negotiate their own unique motor sequences from the horizontal up into the vertical is an excellent way to support proprioception. This is contrary to the modern, common practices of constraining infants and placing them in upright positions before they can get there of their own accord. However, if a child's motor development is less than ideal, all is not lost. Our spatial development continues, and we have the potential to change our space over the entire course of our lives.

If the early childhood teacher understands the spatial ins and outs of proprioception, she has a very powerful tool. *The key question for supporting healthy proprioception at any age is "How do I support spatial development?"* It is helpful if the teacher learns to "read" the spatial configurations of the child over time. When is the child experiencing the successful polarities of raying out and coming to a point in their optimal locations in the body, and conversely when he is not? Out of skillful observation comes helpful doing. Through these observations the teacher can choose activities and sculpt the environment so as to support the child's healthy spatial development, and in turn, his proprioceptive development.

It is also very helpful for children if the mature threefold spatial gestures are living in the adults who care for them. We can't change someone else's space for them, but we can influence it. In fact we are influencing each other's spaces all the time--for better or for worse. The younger the child, the more susceptible he is to our spatial influences. Like the dance students who need the mirrors, we aren't usually aware of our spatial signatures. Fortunately, it is possible to learn to perceive how we are living in our space and to change it. We can come to wear the archetypal spatial patterns which are most conducive to proprioceptive development and to so much more as well. This is one way that we can truly serve as models worthy of imitation for the children in our lives.

Jane Swain is a physical therapist and a graduate of the Level III training in Spacial Dynamics®. She teaches at Sophia's Hearth Family Center in Keene, NH and also has a private practice.