

Self and Other: Proprioception

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It wasn't all that long ago that I first learned about proprioception. At first I could find nothing about proprioception other than descriptions of the receptors themselves, and now it seems proprioception jumps out at me at every turn. How wonderful it is that life keeps serving me up with discoveries of this magnitude. It impacted me so powerfully due to inquiries I had been making during my studies of the senses. Certainly most human experiences and actions can be considered in terms of one or more of the senses being dominant. Reading involves primarily the visual sense. Writing adds something of the tactile. Eating engages taste predominantly, but also smell and even vision. And so on. My inquiry that led to no satisfactory results was to understand dancing in terms of the senses. As is obvious, dancing is of the body and is sensual and engages feeling, yet, what are the senses that dancing engages? Dancers perhaps see themselves, but only from a rather odd angle and even mirror images are strangely distorted. Dancers smell their often sweaty selves, but how can this be "the dance sense." Hearing is important since dancers often dance to music, to rhythms. Yet, postmodern dance demonstrated that dancing can be done in silence without anyone questioning that it is still dancing. Touch is important in some ways—the contact of the foot, and sometimes other body parts, with the floor and perhaps other bodies or objects. Yet, clearly this isn't distinctive of dancing. Let's see ... oh, yes, taste is the last of the five senses. Hmm. Can't see that taste has that much to do with dancing. Very weird.

Then along came proprioception. It is sometimes identified as the kinesthetic sense, another sense or one that significantly extends the sense of touch. Technically proprioception is a neurological phenomenon. Proprioception is based in sensory receptors associated with ligaments in the joints and the muscle fibers that sense and provide feedback (a term I'm now deeply questioning as adequate) to the sensorimotor cortex to the demands placed on joints and muscles both from without and within. It is that sense that helps us keep track of the location of our body (and all its parts) in motion. Proprioception suggests something of a response to my concern. Surely dancing is heavily dependent on knowing where one's body parts are and on being able to move one's body in intended ways. Proprioception clearly is inseparable from movement. At last, I had something to go on. Yet, the implications of proprioception are immense for understanding our sense of self, our sense of ownership of our bodies, our relationship with objects and others. Proprioception creates afferent (from the body to the brain) information and is intimately involved with movement, with agency, with sense of self. It forms a loop, or the other half, of efferent (from brain to muscles) neurological signals that fire muscles. In light of movement studies that show that cognition, conceptualization, and thought can be initiated in movement rather than in the brain in the skull, proprioception can be understood as feed-forward as importantly than as feedback.

Time and again we have come upon the idea that self, cognition, awareness, vision, depth perception, and vitality are based in self-directed body movement. Given that academics are scarcely moving entities—bumps on logs, desk chair potatoes—we are perhaps challenged enough by such ideas. We study texts, histories, thought. Movement is of the body and realizing that we are part of a religious/cultural heritage that has had distrust, even disdain, for the body, we are all the more

challenged by the knowledge that self, cognition, vision, depth, and so on are formed, nurtured, and even made possible by self-directed bodily movement. Should we be able to withstand the threat of such a position to proceed, then to actually understand proprioception—that which negotiates movement in every environment—takes on not only greater, but vital, importance to our intellectual endeavors of understanding religion and culture—for proprioception is at the heart of self and other—and our ongoing efforts to understand ourselves as human beings; it is key to consciousness.

Let's begin with the work of Shaun Gallagher.¹ In his book *How the Body Shapes the Mind*, he has taken the trouble to sort out the differences between body image and body schema.

Body schema is the system of sensorimotor processes that constantly regulates posture and movement and it does so without reflective awareness. Body schema is essential to our living without having to reflectively direct our quotidian and routine movements. There are many sensorimotor programs that comprise the body schema, each directing practical tasks such as reaching for and grasping a glass or habitual motor patterns such as the systematic routine of combing our hair or even the less pleasant habitual motor patterns of getting one's keys from one's pocket two minutes before reaching a locked door or annoyingly scrunching your nose every fifteen seconds. Sensorimotor patterns that comprise body schema are operative in skills such as driving a car or playing a musical instrument or dancing. Body schema is dependent upon proprioception.

Body image is the system of perceptions, attitudes, beliefs, and dispositions pertaining to one's own body. Body image points to the personal level of experience of the body that involves a sense of ownership. Body image is our sense of body as it appears in our consciousness. That the term includes the word "image" suggests a primary dependence on the visual sense. Body image is basically how we see ourselves in our mind's eyes. Proprioceptively body image provides information about joint position, limb extension, posture, gesture; that is, proprioception is how we know our body position and posture. Body image is an awareness, a visual structure, but also a feeling kind of knowing. We can know or sense our body image because of proprioceptive information.

Now, two examples, drawn from Gallagher, are important in understanding aspects of proprioception. The first has to do with the loss of proprioception (or nearly so) and the second has to do with "invisible imitation" and when this ability arises in the human developmental process.

Studies of rare cases where humans have lost certain aspects of their proprioceptive sense show that there is a cross modality between vision and touch and proprioception. Gallagher depends heavily in his research on the single case of Ian Waterman who is described as a remarkably rare case for losing proprioception throughout his body below the neck. Gallagher and his colleagues use Waterman for many experiments to help him understand proprioception more fully.

First, I think some questions need be asked. As I understand it Waterman lost, due to neuropathology, the ability to conduct proprioceptive information to the brain via the major ??? It would seem that the actual proprioceptors in the muscles and ligaments continue to function, yet providing information

¹ Shaun Gallagher, *How the Body Shapes the Mind* (Oxford: Clarendon Press, 2005).

related to movement in a rather different way. I think this remains an important arena for fuller understanding that may or may not be known by Gallagher. Still, Waterman is described as deafferented indicating that the proprioceptive information does not make it to the brain. What is learned from these studies is that remarkably vision and proprioception are intermodally linked. In time, the deafferented can learn to use vision, rather than the interoceptor information, the proprioceptive information fed back to the brain, to monitor and control movement. One way to think of this is that body image can be developed to do some of the work of body schema. Another is that visual feedback from the location of body parts can be fed forward cross-modally to the sensorimotor system that fires the muscles in movement. There remains the question for me of how the responses of the muscles to the environment can be microadjusted in the millisecond timeframe required to perform movement. It seems impossible that vision could provide enough proprioceptive information at the level of muscle fiber in complex muscular systems to result in useful movement. While this substitution is possible it is never the same. Visual monitoring, translated into motor stimulation and control via the operative proprioceptive system is awkward and slow simply because it requires so much more neurological processing some of which is temporally inefficient compared with a wholly proprioceptive process.² This helps us appreciate the difference between body schema and body image and also that, while they are distinct and different, they can overlap in some respects. It also shows us that visual information can be translated cross-modally to proprioception and movement. Perhaps less surprising there is a similar relationship between touch as exteroception and proprioception.

The second body of relevant materials Gallagher presents has to do with “invisible imitation” that has been demonstrated to be a faculty even of newborns. Babies from one to 72 hours old are shown to be able to imitate the facial gestures of persons in their environment. It had been long held that such imitation is not possible until some months into life at the time when the infant begins to gain some sense of self and sense of self-awareness or some distinction of self and other. These new studies show that we are born into an innate intermodal visual-proprioceptual sensorimotor linkage, a natural intermodal connection between self and other.³ Put powerfully, we are born into a world of others. This also suggests that infants, long before they have any primary or fully conscious notion of self, nonetheless have a rudimentary proprioceptive self, that is, a sense that involves one’s own sensorimotor possibilities, body postures, and body powers. Gallagher holds that neonate invisible imitation evidences a rudimentary differentiation between self and non-self. Further, since proprioceptive awareness (complementary to simply proprioceptive information) is an awareness of a body (even as it operates as body schema that is pre-reflective) that can only be of one’s own body. This Gallagher feels is consciousness.

² Massumi (*Parables for the Virtual*, pp 58-59) offers some insights in his discussion of “movement vision” and “mirror vision.” Vision stops movement in that it is intent on image rather than movement as such. Thus, it would seem that to monitor movement with vision would require, in some sense, the overcoming of the image propensity of vision in order to get at the movement as such.

³ Gallagher, p. 81.

I want now to turn to Brian Massumi's book *Parables of the Virtual*.⁴ He is much more opaque and seductive than Gallagher and there is much here to engage us. Massumi is concerned with the body and change. He notes that it has been our approach to always see the body in position rather than in motion and this has skewed and truncated our understanding of not only the body, but of the many aspects of ourselves (our cultures and religions, as well) that are connected with body movement. Much of his work teases out how we might catch something of movement in itself without simply converting it to position or to a point in space; how we might avoid the reduction of movement to non-movement.⁵

I'm delighted by his introduction of ideas such as paradox, vagueness, and play. What I understand to be his strategy in providing a peek into movement-in-itself is what I think Derrida was referring to by his term "structurality." Derrida also used the term "play." One approach suggests that movement as structurality is the verb or action or processes engaged and involved, rather than structure, principles, places, meanings. Further, structurality also suggests the uncapturable, the illusive, the oscillatory, the irresolvable. Massumi directs us toward change as the ongoing movement of the body that any capturing of it is to lose the designated concern, that is, the moving aspect of movement. He speaks of movement in terms of an "incorporeal dimension" of the body, an "incorporeal materialism."

Massumi seems a bit obsession with Ronald Reagan, as bad actor yet as an actor who eventually got one line right. In this context, he discusses "mirror-vision" and "movement-vision." Mirror-vision is, as the word mirror suggests, reflective; that vision of seeing oneself as others see us. Massumi describes this as the "ongoing reciprocal determination of I-me/I-you." Movement-vision is not quite so easy to grasp. It is discontinuous with mirror-vision and the relationship between them cannot be mediated. Movement vision is a grasp of the movement and only the movement; it is absolute and self-distancing. In a passage in which he describes how he understood Ronald Reagan to finally grasp movement-vision, Massumi writes:

When Reagan enters the space of movement-vision, he is leaving behind the empirical world as he knew it. He is coinciding with a perspective that is neither that of his plain old self vis-à-vis the others and objects populating neither his everyday world, nor that of the others in that world vis-à-vis him as an object in their sight. He leaves the intersubjective world of the other-in-the-self, self and other identity-bound in mutual missed-recognition, for a space of dislocation, the space of movement-as-such, sheer transformation.⁶

Massumi puts movement-vision yet another way:

The elementary unit of the space of movement-vision is a multiply partial other-perspective included in a fractured movement-in-itself: change. Change: that which includes rupture but is nevertheless continuous (but only with itself, without complement).⁷

⁴ Brian Massumi, *Parables for the Virtual* (Durham: Duke University Press, 2002),

⁵ This is, of course, a core issue in the study of dancing.

⁶ Massumi, p. 51.

⁷ Ibid.

Echoing phrases of Gilles Deleuze and Felix Guattari, Massumi suggests that movement-vision is “the body without an image.” Image, of course, suggests a snapshot marking a moment in process rather than the process itself. Massumi must invoke such shocking phrases to wrest us from the habits of understanding body as “image” reducing body to points in space, to mere object.

Massumi recognizes that both strategies, that is, “movement-vision” and “body without an image” rest on vision and that it is the nature of vision to arrest movement to image or as a spatial trajectory of movement. Vision, while connected with movement, is not the best way to get at what he wants.

Here enters proprioception. Finally. Massumi writes that “the spatiality of the body without an image can be understood even more immediately as an effect of *proprioception*, defined as the sensibility proper to the muscles and ligaments as opposed to tactile sensibility ... and visceral sensibility”⁸ In what is to me a brilliant discussion of proprioception, Massumi gives us much to appreciate and contemplate. He differentiates layers of the gross bodied senses. Touch, the tactile sense, in the limited sense of exteroceptors in the skin perceive subject and object in that they mediate between feeling outside and inside. Visceral sense, that feeling in the gut—that feeling response of fright, for example—is the deepest layer of perception. Interestingly, as Massumi points out, visceral perception precedes the exteroceptive sense perception surely because it involves different areas of the brain and anticipates the translation into explanation of sight or sound or touch perception. Visceral perception registers intensity. Viscerality is a rupture in the stimulus response path; it is the perception of suspense; it is the space of passion.⁹

Turning to proprioception, Massumi writes:

Proprioception folds tactility into the body, enveloping the skin’s contact with the external world in a dimension of medium depth: between epidermis and viscera. The muscles and ligaments register as conditions of movement what the skin internalizes as qualities: ... Proprioception translates the exertions and ease of the body’s encounters with objects into a muscular memory of relationality. This is the cumulative memory of skill, habit, posture. At the same time as proprioception folds tactility in, it draws out the subject’s reactions to the qualities of the objects it perceives through all five senses, bringing them into the motor realm of externalizable response.

Proprioception effects a double translation of the subject and the object into the body, at a medium depth where the body is only body, having nothing of the putative profundity of the self nor of the superficiality of external encounter.¹⁰ This subjective and nonobjective medium depth is one of the strata proper to the corporeal; it is a dimension of the *flesh*. ... Proprioceptive memory is where the infolded limits of the body meet the mind’s externalized responses and where both rejoin the quasi corporeal and the event. As infolding, the faculty of

⁸ Ibid., p. 58.

⁹ Ibid., p. 61.

¹⁰ Yet, it is important here to recall that Gallagher makes much of the importance of proprioception to the establishment of self and the distinction of self and other.

proprioception operates as a corporeal transformer of tactility into quasi corporeality. It is to the skin what movement-vision is to the eyes.¹¹

Joining visceral perception and proprioception Massumi calls this conjunction “mesoperception,” which he describes as

The synthetic sensibility: it is the medium where inputs from all five senses meet, across subsensate excitations, and become flesh together, tense and quivering. Mesoperceptive flesh functions as a corporeal transformer where one sense shades into another over the failure of each, their input translated into movement and affect. Mesoperception can be called sensation, for short.¹²

This discussion of proprioception is a complex of ideas with far-reaching implications. To summarize and digest a bit, some things can, I believe, he said.

- Proprioception translates sensations on the skin (registered as stress on muscle fibers and ligaments), conditions of movement, as qualities¹³
- Inversely the sensorimotor programs (gestures) translate qualities held in memory into patterns of movement
- Proprioception translates the way the body encounters objects, including others, through movement into relationships
- Relationalities are proprioceptively recorded as posture, gesture, habit, skill, body schemas, sensori-motor patterns
- Proprioception translates qualities both incoming and as responses between memory and sensorimotor responses or expressions

Proprioception, movement-vision, change, flesh,¹⁴ seduction, reversibility, play, structurality are all importantly interrelated and enjoy a loose synonymy.

Massumi was fascinated by Reagan’s effort, as an actor, to extend his awareness beyond himself. How was he to comprehend the condition of losing the lower half of his body, as did the character he was to play? His supposed experience of movement-vision produced the delivery of the required line in the most convincing way. He wasn’t acting at this point; he had, momentarily, become other, the amputated other.

The issue of self and other underlies all in this discussion. While the self-other distinction is self-evident, given that we live and ask these questions having achieved something of this distinction, when we trace back the origin of this distinction it isn’t so readily grasped. Further, it is a rather profound philosophical concern to understand how we comprehend anything beyond our selves. What keeps us from being profoundly isolated from others and alone?

¹¹ Ibid., p. 59.

¹² Ibid., p. 62.

¹³ See also Jonathan Cole and Barbara Montero, “Affective Proprioception” *Janus Head* 9(2), 299-317.

¹⁴ Maurice Merleau-Ponty, *Visible and Invisible* (Evanston: Northwestern University Press, 1967), p. 155.

An important insight is that mesoperception—which is experienced as sensation, that is, as a feeling kind of knowing, awareness, consciousness—translates between self and other and does so in both directions. External stimulations are connected with relationalities, qualities, and values. Internal values ... engender sensorimotor patterns, movement. This oscillation or loop is at the core of gesture.

I hope that it is abundantly clear that a discussion of proprioception based in scientific studies does not explain away all that is unknown about being human and thus reduce us to comprehensible mechanisms, that it is, somehow a debunking of the human spirit. In the midst of his discussion of movement and change Massumi engages in a discussion of what we as academics are doing. This is a statement we should all print and post on the wall above our computers:

The balance has to shift to affirmative methods: techniques which embrace their own inventiveness and are not afraid to own up to the fact that they add (if so meagerly) to reality. There is a certain hubris to the notion that a mere academic writer is actually inventing. But the hubris is more than tempered by the self-evident modesty of the returns. So why not hang up the academic hat of critical self-seriousness, set aside the intemperate arrogance of debunking—and enjoy. If you don't enjoy concepts and writing and don't feel that when you write you are adding something to the world, if only the enjoyment itself, and that by adding that ounce of positive experience to the world you are affirming it, celebrating its potential, tending its growth, in however small a way, however really abstractly—well, just hang it up.¹⁵

Certainly what we should be doing in our studies, and this has nothing to do with any tension between religion and science, is what Massumi term “miraculation.” This is a wonderful word. Our studies should, through deep consideration from every possible perspective, grasp the ungraspable complexities and depths of being human.

What I hope you see in this discussion is that proprioception can be limited easily enough to body mechanics, neurology, and body work. Proprioceptors, like eyes, are neurophysiological objects that perform certain necessary bodily functions. We need proprioception to be able to accurately grab our asses which we cannot see, with both hands, and, of course, a few other valuable things. Yet, proprioception, when miraculated by the likes of Massumi and Gallagher, comes to be connected with our sense of self, with fundamental relationality, with subjective-objective interplay, with consciousness, with body ownership. As students of religion and culture are these studies of proprioception, movement, change simply curiosities mere incidentals in our ongoing studies of texts? Certainly they can be. That is our choice. However, should you choose, the possibilities are manifold. Anything in our study of religion and culture that has to do with self (or concepts of self or distinctions of self or denials of self), with movement (pilgrimage, dancing, ritual, etc), with other (theology, theological concepts, gods, other humans, other cultures, objects, etc), with consciousness (concepts thereof, actions related to, etc), action and agency, power and absence of power . . . all these things . . . can be understood more richly, more appreciatively, more profoundly by having an awareness of this deeper discussion of proprioception. To put it more in Massumi's terms, studying cultures and religions and any of the

¹⁵ Massumi, p. 13.

myriad aspects that comprise them, from a perspective of this rich understanding of proprioception will be enjoyed as reversible miraculation. You will see your subject as richer, more profound, more enjoyable, more remarkable and what you understand of your subject will feedback to help you become a richer, more profound, more joyous human being. I agree with Massumi, if we can't do this, then we should just hang it up.

Throughout the semester I have tried to dial down my interest in dancing and my understanding and appreciation of it. Last lecture I failed and played it with maximum volume. I simply cannot resist adding here what I hope is a potentially interesting postscript. It offers a slightly more specific example and a reason why I am not about to just hang it up. Besides it returns us to the issues that motivated my interest in proprioception as described at the outset of this lecture. That's good style, ain't it?

Proprioception, as I discovered, is the prominent sense involved with dancing in that most simple and direct sense that proprioception is the sense that provides us an awareness of the position and location of the parts of our bodies and further is the basis on which directed and controlled movement is possible. However, having considered proprioception through the works of Gallagher and Massumi, we have found proprioception, when considered in terms both grounded in and transcending corporeality, to be fundamental to all of the senses and all of our actions. Proprioception is body and movement, but it is movement in process, movement-as-such, flesh in its reversibility, perception in its play, self in its otherness. Proprioception is seduction, play, structurality as incorporeal materialism.

Dancing is, in the most basic sense, movement, yet not any movement is dancing. Might we not suggest that what distinguishes dancing is that it enacts just these qualities of mesoperception; it enacts movement-vision; it plays out change. It is not about anything; it does not mean anything; it is a display in corporeal moving terms, of that which cannot be captured as a point in space or a trajectory through space. Dancing is an exercise in and celebration of self-othering¹⁶ or other-selfing that enacts without production or application our proprioceptive awareness, our becoming in being, our interplay with the world through movement.¹⁷

¹⁶ I will need soon to develop this in terms of the neurological difference between understanding self and other as separate beings where other is in the environment and understanding other proprioceptively as one does one's own body. This needs to be a full on technical discussion in neuroscientific terminology. The implications are clearly enormous. How and at what stage of human development are we capable of making something of, out of, our own bodies that is understood as other, yet experienced as self, that is mesoperceptively? This will take a bit of time and a great deal of serious concentration on materials I'm only just beginning to feel slightly comfortable with.

¹⁷ At some point I must expand this to consider the function of mirror neurons in dancing, which surely has something to do with audience experience.