

## Mirror Neurons

### Pille's "Calendar Blog" January 2012

Recently there has been a lot of talk, and many research papers reported on the notion of "mirror neurons" as having to do both with how living beings learn, and with claims of empathy. I do not doubt the existence of pathways that are triggered by circumstances that are somehow similar but I find the explanations to be rather limiting, rather reductionist. The notion that there should be a simple, almost linear logical explanation, for what we observe appears to me as a denial of systemic processes. I have found it difficult speak properly about this with those who enthuse about it.

I think for many their enthusiasm is based on wanting to claim that being caring of one another is innate in humans. For others it is based on their desire not to be isolated from other living beings through the modern logical demand that we not anthropomorphize, and thus deny that animals have feelings or that animals have the ability to care for others. The notion that people think is being implied by modern "science", namely that animals are somehow complex biological robot-like devices that are driven by stimulus response just doesn't sit comfortably with them. If we can prove that they "feel empathy" we can legitimize them being part of our extended family of beings, we can prove that they too are caring beings, that they have a mind and a spirit, or that they are "conscious beings". I think we are looking for an acceptable "scientific" argument to justify our desire to accept animals as legitimate beings. Further, I think we are looking for a simple neurological explanation for how infants and young children naturally "learn to be human" and that we therefore are fundamentally caring beings.

I asked my colleague and friend, Humberto Maturana about this. He thought for a moment, and offered an analogy that for me served as the key for opening my conversations with others. I will tell you his analogy first, and then see if I can take it a little further as I might do next time someone asks me about this. I am generally not orally articulate, I have to think things first and find the words, and then listen to how those words are heard, and reshape them... in other words communication in words is for me a work of art, a mental sculpture, and it takes a while. Indeed, these calendar writings are in a sense a critical part of that process, if there is no one to listen to so I can "see" your listening, and thus see what it is I am creating, I cannot make my "verbal sculpture".

What Humberto talked about was driving a car. When we are driving, and come to a curve in the road, we move the steering wheel in a way that corresponds to that curve. Often we even lean our bodies that way (as if it mattered inside the car) This is us, our body and brain together, mirroring the circumstances in our environment; though we never speak of it that way. It is an instantiation of what living beings are always doing in the ongoing process of remaining connected with their medium. In other words, it is an instance of sensory motor coordination, namely the circular or ongoing dynamic and reciprocal relation between a living being and its medium (structural coupling) that enables us and all other living beings an ongoing connection with our medium.

Further, were we to record what goes on in the nervous system, we would find the same neurons that are active when we drive, also showing activity when we do lean into a fast turn while running or bicycling ... or watching a movie of someone doing these things, or driving, or even thinking about how it is we feel when we do these things.

Another set observations fits with these reflections. People have written about “the inner game of tennis” and other sports, and have noted that often a new skill, such as bicycling, improves between actual sessions. The pattern of neuronal activity that takes place in the absence of the overt behavior would thus be of the same class, we could name these “mirror neurons” as well. They “mirror” the activity of the neurons that takes place in the actual doing.

One comment I expect to hear is that “This is all very well and good for activities, but what we are observing in the mirror neuron research shows it happens with emotions!” The stumbling point here is that we like to consider emotions as “things” rather than as manners of behaving. Emotions are characterized culturally according to the different flows of behaviors that may take place. Further, all behavior is accompanied by some inner feeling. We would not be able to visualize how to throw a ball, we would not be able to dream running, we would not be able to visualize or hear a melody in our head, or feel sad when we think of a missing friend, or be happy in anticipation of some event if we did not have the ability to sense, and then evoke, an inner feeling that corresponded to some doing or happening in our outer world.

It happens that the correspondence between our inner feelings for what we call emotions is something we learn to pay attention to more than we often pay attention to other inner feelings. We learn to notice our own inner feeling according to how others respond to the flow of our behavior -- indeed parents specifically teach their children to reflect on how they are feeling as they note the behavior that to them implies a particular flow of behavior, ie. an emotion.

What I’m getting at is that we sense the configurations of ourselves and that those configurations are always relevant to the circumstances. We can detect, with instruments, some of the neuronal configurations, and what we have looked for, and find, are patterns of nerve responses that have to do with the behavior that is appropriate to the circumstances. When we look at circumstances that evoke a feeling in one being, seeing either the circumstances, or the result of those circumstances as the outward manifestation of that feeling, we and other animals respond appropriately. It is often appropriate to respond as others respond! I think of the flock of bushtits that comes to the feeder outside my window. When one detects an unexpected movement, they all take off. They must all be “mirroring” the internal nervous dynamic of the one who sees, and they must all be feeling that momentary agitation that goes along with this inner dynamic.

We are not comprised of separate systems, animals are not comprised of separate systems that mechanically create specific responses. We don’t need to use the reductionist argument of mirror neurons in an unexpressed desire to reclaim our world as a wholeness. We are all systemic wholes operating in a systemic cosmos, even as we discretize it into manageable, and delightfully “playable” elements in the richness of language and culture.

After the driving analogy, and a bit more conversation, Humberto remarked that rather than being annoyed with the reductionist way things are being explained, I could take the stance of being interested; after all this is the present that we are living. So we laughed about how our cultural norm is to be genetically reductionist, sensorially reductionist, behaviorally reductionist, emotionally reductionist, neurotransmitter reductionist, hormone reductionist ... and I might add that we are even reductionist about the notion of “reductionist.”