

Mirror Neurons on the Wall. Who's the Fairest of Them All?

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I had decided the topic for my upcoming lecture, yet was still vague about the specifics. My objective was to introduce the concept of alternative means of perception; specifically, as a potential tool for assessing patients. Whenever I address this topic, students, as well as practitioners, instantly speak of intuition. Stories are shared of times they knew beyond a shadow of a doubt what their friends or family members were feeling or thinking, before anything was ever verbally confirmed, as if they could read the person's mind.

How did they receive such information? Some had heard words or sounds; others had seen images; still others had experienced physical sensations in the gut or throughout the body, often similar to that of their friend. How are such experiences possible? Even if we call it coincidence or intuition, what does that mean? Some of my highly empathetic students and patients, those who accurately and deeply feel the emotions of others, find themselves branded as either "too sensitive" or merely imaginative.

To present another perspective on empathy and intuition, I wanted to share with the class the current research on mirror neurons. Saturday, two days prior to the lecture, I found myself browsing the magazine rack at my local booksellers. There, gracing the cover of *Scientific American, The Mind* edition, was a tag line for a feature on mirror neurons. I bought the magazine and went home, delighted with my good fortune and great timing, and thought nothing more of it. That evening, as I thumbed through

the pages of the *Yoga Journal* that had arrived by mail earlier that day, I began reading a piece on empathy. Four paragraphs into the article, the words *mirror neuron* jumped off the page. Mere coincidence? Synchronicity? Whatever the explanation, the topic seems rather timely.

What are mirror neurons exactly? A team of scientists in Italy came upon the discovery of these unique brain cells quite by chance. Researching the brains of macaque monkeys, the Italian team found a group of cells in the premotor area of the monkeys' brain that fired upon witnessing one of the researchers reaching for a raisin. What was so startling about this was the fact that these were the same cells that had fired when the monkey itself had reached for the raisin. The scientists were amazed and replicated this finding several times before naming these cells mirror neurons.

Located in an area of the monkey's brain labeled the F5 region, these neurons fired not only when the monkey saw an action being performed (reaching for a raisin), yet also fired upon hearing the sounds produced from said action, such as tearing paper to get to the food. Furthermore, the neuronal firing occurred regardless of whether or not it was done by another monkey or by a human. While we are not macaques, neuroscientists have discovered the human homologues to the F5 region mirror neurons. Our own mirror neurons act in a similar fashion and occur in high prevalence in the posterior parietal cortex, inferior frontal cortex, superior temporal cortex, anterior insula and the

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Dr. Lichtenstein is a licensed naturopathic physician living and breathing in Cambridge, Massachusetts. His passion is shifting the healthcare paradigm from an emphasis on illness to one of living well, despite diagnosis or disease. Currently, he practices as meditation teacher, breathworker, energetic bodyworker, and movement and yoga therapist at WellSpace (www.wellspace.com). For the past decade, he was an adjunct faculty member at Bastyr University where he taught counseling, yoga therapy, pranayama theory, movement therapy, and naturopathic philosophy. He created the *Explorations in Mindfulness* and *PranaPlay* workshops to teach the cultivation of life through active mindfulness, meditation and movement, believing that body-centered awareness is the key to unlocking the doors to our innate wellness.



amygdala.

According to the research, it appears that humans have an innate, hardwired ability for perception and empathy outside of conceptual reasoning. Without the need to interpret, analyze or process the actions of others, our mirror neurons appear to respond automatically. Functional MRI studies reveal that mirror neurons fire, even prior to an action being completed. These amazing cells apparently scan the situation, read the context in which a movement is occurring and fire at the mere implication of intention.

When we witness someone performing a given action, our mirror neurons fire as if we were completing the action ourselves, even though we may remain stationary. For instance, when shown a picture of an outstretched arm devoid of context, such as against a blank background, mirror neurons did not respond. Yet, when the same outstretched arm appeared against the backdrop of a table setting, mirror neurons responded as if the arm were reaching to grasp the items before it.

Change the context or setting, and change the mirror neurons stimulated. Keep in mind, all of this happens without conscious thought. Hence, the hypothesis that our brains are programmed to read the intentions and actions of others. Could this be the basis, then, for how we understand people and their motives, as some scientists suggest? The brain apparently translates what it sees into its own neural experience of the event in order to gain sensory experience and insight. Thus, we are unconsciously performing our own internal simulation of the experience.

In regards to empathy and compassion, in order for us to understand another person, we need “to walk in their shoes” as the saying goes. The pres-

ence of mirror neurons suggests that we possess such an innate ability for doing just that. Studies of individuals who suffer from autism reveal abnormalities with mirror neurons. When given photos of faces expressing varying emotions, those with autism demonstrated an inability to empathize and feel the emotional significance of the facial gestures despite being able to accurately recognize and mimic the facial expressions.

For the rest of us, when we watch a person moving in some fashion, including their facial expressions, our mirror neurons translate those actions into their own neural experience of that event. This thereby informs us on a deeper level separate from critical thinking and reasoning, allowing the analytic part of the brain to remain inactive. Whether we see a golf pro complete a swing or a friend in tears, our mirror neurons fire as if we were actually the one playing golf or crying.

As most parents already know, children are excellent imitators. Dr. Andrew Meltzoff of the University of Washington has shown that within minutes after birth, if you stick your tongue out at your infant, your infant will immediately respond in kind, as the writer of the recent *Scientific American* piece will testify. Later in life, children seem to give more credence to what they witness over what they are told, despite hearing incessant warnings and advice. Admonishing your progeny about the ills of smoking, while maintaining your pack a day habit, tends to be an exercise in frustration and futility; mirror neurons offer a plausible explanation as to why.

As long as children see their parents, or others for that matter, repeatedly carrying out certain behaviors/actions, they, themselves, are practicing them as well; at least in the form of neural simulation. By the time they are adolescents, their brains have

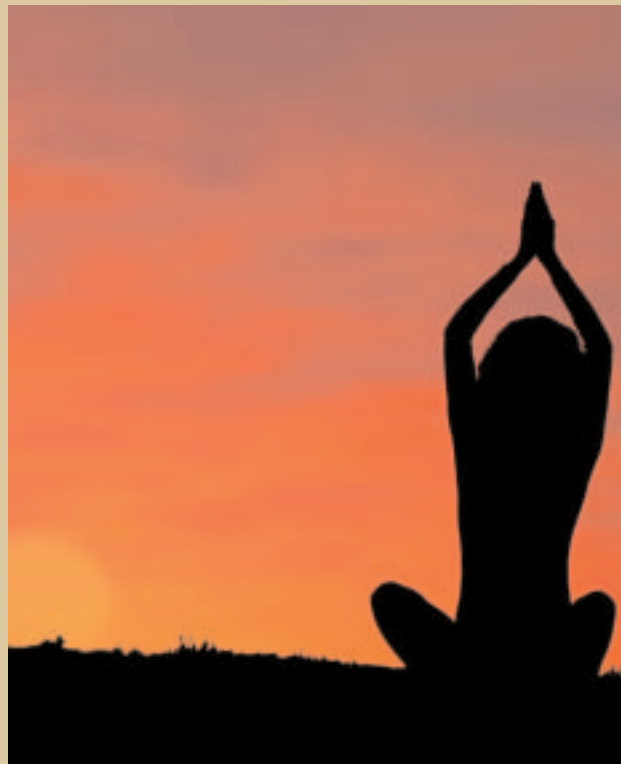


already smoked thousands of cigarettes, consumed hundreds of drinks, binged or starved themselves, or lashed out in anger. On the contrary, they may also have practiced meditation, exercise, tolerance, compassion, and kindness.

The yogis of yesteryear instinctively knew about mirror neurons when they asked us to consider our actions and reflect upon what we are practicing in our daily life. According to chapter one, aphorism fifteen of the *Hatha Yoga Pradipika*, six behaviors destroy yoga, that state that occurs when our body, mind, breath and spirit are aligned and functioning in unison. These behaviors are: overeating, exertion, talkativeness, adhering to rules, *being in the company of common people*, and unsteadiness (wavering mind). Reading these aphorisms to my students, many become fixated on the phrase, being in the company of common people. Throughout my life I have heard adults and teachers urging young people to reflect on the company they keep, as it is a reflection on them. With our new knowledge about mirror neurons, I agree with this suggestion, though I may be basing it on another reason. I am concerned about what we are practicing neurally.

When we look at our environment and the people in it, we need to evaluate their practices, for practices speak to values. I am not advocating for judgmental and prejudicial treatment of others. I am not suggesting that particular values and ideologies reign supreme. I am suggesting, as I believe the yogis were, that if we surround ourselves with others who are judgmental, by witnessing their constant condemnation, we will be practicing criticism, even if our tongue is silent. If the company we keep is apprehensive and anxious, we may be practicing fear and panic without even realizing we are doing so. Such is the basis for warning recently recovering alcoholics to refrain from frequenting favorite watering holes. Their mirror neurons may fire - compelling them to drink.

What are you practicing in life? While the debate over children and the exposure to violent images in the media has raged on for decades, neuroscientists posit that as a child - or adult for that matter - watches gun shots, sword fights, and bombs exploding, their mirror neurons are simulating what they see, thereby helping them practice such acts. We may say that we are mere spectators who are impervious to such images, but is it so? What do you watch every day? What are your favorite television shows, movies and books? What type of entertainment do you actively seek? Does it reflect the person you would like to be, or does it reflect the person you are becoming? Do you wonder why your temper is short, your words harsh, and your countenance sour? Take stock of your surroundings. Who consumes your time? What activities fill your days? What forms of entertainment do you enjoy?



In the **Art of Happiness**, the Dalai Lama describes meditation as a form of self-remembering. Sitting down to meditate reminds him of how he would like to be in the world that day, which speaks to the importance of intention and ritual.

This reminds me of a young man in his early twenties who came to see me at the urging of his friends. Physically healthy, he suffered from increasing depression. During the first session I asked typical questions, inquiring about his life, struggling to understand his experience of the world. After an hour, feeling as if no inroads had been made, I asked about his life prior to depression. It was then that his posture changed; he smiled and he spoke about his daily routine one year ago. At that moment, one could argue, his mirror-neurons began firing as he began to practice life affirming thoughts and actions.

A year ago, this man was content and engaged in life. He woke at 6 AM, six days a week to go to the gym and exercise. He carefully monitored his diet, consuming only whole foods, while avoiding sugar, caffeine and alcohol. He arrived to work full of energy and initiative. After work he would either spend the evening with friends or go home, cook himself dinner and relax. Surprised at what I was hearing, I asked him what had changed. He shook his head and sighed, saying that his life had been so regimented. It seemed he had no freedom.

Scratching my head, puzzled by this statement, I remarked, "So you're telling me that you had this lifestyle, with these daily rituals, and you were happy. Yet once you labeled them regimented and

strict, you ceased exercising, began eating fast food, stopped spending time with friends, slept in every morning, and grew depressed. Is that right?" He stared at me for a moment with his head cocked and eyes locked on mine. Then he said, "Yes." The last twenty minutes of the session was uneventful.

I asked him to think about what he is practicing and we scheduled an appointment for the following week. A few days later he called to cancel the appointment. "I got it," he said. "It all became clear." He went on to tell me that after our first session in the morning - that very same day - his colleagues at work commented on his improved mood. The day after the appointment, he continued, he got up at 6 AM, returned to the gym and changed his diet.

He recognized how his critical mind, the one that kept labeling and judging, telling him that a person *should* be able to do whatever they want, anytime they want, that this mind interfered with happiness. During our conversation, as I mirrored back his own words, he recognized the necessity of ritual and the practice of self-care. Exercise, diet and friendship were not about obtaining the ideal body or gaining social status. These rituals surrounded him with the life energy that reflected the person he wanted to be. Through his choices he was practicing life.

We all need to reflect on our choices, yet not in a moralistic way. Such reflection is devoid of good or bad terminology. The moment we deem an action or behavior as good or bad, we vilify or demonize it. What would happen if we ask ourselves about our practices? The people with whom we surround ourselves, the forms of entertainment that we consume, the activities in which we engage, they all allow us to practice particular ways of being in the world through neural simulation. When you walk into a room and feel the energy, your brain is experiencing

what you might not be able to consciously detect.

As a means of self-integration, stop and take a moment. Breathe. Look at your surroundings. What are you practicing in this environment? Does it align with your ideals? Are you being congruent? This is not to say we begin to avoid people we do not like or situations that are challenging. In those instances, we need to be steadfast, determined; we need to keep and return to ritual. What do I want to practice given my current circumstances - equanimity, kindness, and compassion? What would that entail? From there, we then try to make it so.

As I write this, I casually glance out my window every now and then. The sun is streaming through the trees after ten days of downpours in my new state of Massachusetts. When I see the leaves swaying in the breeze, I remind myself to practice breathing. I am about to close the computer and walk away for now. Before I do, I ask myself, what do I want to practice today? This is followed in quick succession with thoughts and images of my environment. As long as I can remain cognizant to my environment, I might be able to notice when I am inviting qualities and behaviors into my bodymind, and then choose otherwise... Oh, if it were only so easy.

Readings

1. Miller, Greg. Reflecting on Another's Mind. *Science, Mind*. Vol 308, 2005. pp. 945 - 947
2. Azar, B. How Mimicry Begat Culture. *Monitor in Psychology*, Vol 36, No 9. pages 54 - 57.
3. Buccino, G. et. al. Mirror Neurons System and action Recognition.. *Brain and Language*.
4. Gallese, V. et al. Action Recognition in the Premotor Cortex, *Brain*, Vol 119, No 2 pp. 593 - 609.
5. Iacononi, M, et. al. (2005) Grasping the Intentions of others with one's own mirror neuron system. *PLoS Biol* 3(3): e79. pp. 529 - 535.

