

A Local Soul Trapped in an Alien Body

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Abstract

Through the examination of a radical case of polyneuropathy observed by Oliver Sacks, a patient's loss of proprioception brings about both medical and philosophical mysteries. Using Sacks' observations as chronicled in his book, *The Man Who Mistook His Wife for a Hat and Other Clinical Tales*, the affected areas of the neuropathy are determined with modern medical knowledge, accounting for the symptoms of proprioceptive loss. This situation revealed interesting avenues of investigation, spurred along by Sacks' own comments, into the emergence of beliefs about the body, and the reason for the extensive degree of integration between consciousness and body.

Introduction

Where is your body? Whose is it? The likely answers are, "Where I am," and "mine." These questions are not difficult, and neither are the following. If asked where your hand was, you would know, and if asked where your foot was, you would know. With the increasing quantity, the questions become trivial and redundant; however, it is in their trivial and redundant nature that a vital observation is made. You know the position of your body and extremities both consciously and unconsciously. There are no questions of location or ownership. This observation has unveiled your sense of proprioception, the "position-sense" of the body, which allows for the generally effortless control we have over our movement (Sacks, 1985). Now imagine losing this sense of position and revoking this sense of ownership. Is it even possible?

The loss of proprioception can, and does, happen. In 1977, Oliver Sacks observed a woman admitted to the hospital for a routine gallbladder removal, but while there, she began to be "very unsteady, with awkward flailing movements, and [drop] things from her hands (Sacks, 1985)." The condition both persisted and worsened as time passed. Within a day of the initial symptoms, the woman was unable to control her own movements correctly, and reported, "I can't feel my body. I feel weird—disembodied" (Sacks, 1985). In addition to the sense of disembodiment she described, "I've already noticed that I may 'lose' my arms. I think they're in one place, and I find them in another" (Sacks, 1985). This testimony, in light of the definition of proprioception, gives evidence that the loss of sensory-motor information and the sense of ownership and control can indeed occur. Now established that the loss of proprioception is fully feasible (though rare), the cause, or causes, were still unknown. A mystery illness resulted in the disembodiment of an individual, though she remained fully conscious and, rather, trapped inside herself.

The search for the cause of the patient's sudden loss of proprioception begins with the original observation and diagnosis by Sacks. He observed:

The picture revealed by spinal tap was one of an acute polyneuritis, but a polyneuritis of a most exceptional type: not like Guillian-Barre syndrome, with its overwhelming

motor involvement, but a purely (or almost purely) sensory neuritis, affecting the sensory roots of the spinal cord and cranial nerves throughout the neuraxis (Sacks, 1985).

Polyneuritis, or polyneuropathy, is a debilitating disease in which inflammation of nerves causes demyelination, or the destruction of the myelin sheath around the axon of a neuron (Hughes, 2002). As this occurs, the neurons, or nerves, lose functionality and the systems they encode information for are crippled. The polyneuritis that Sacks encountered was not one of any ordinary variety. He contrasts it to Guillian-Barre syndrome, which is a fast onset "acute inflammatory demyelinating polyneuropathy characterized by... muscle weakness, paralysis, and hyporeflexia with or without sensory or autonomic symptoms (Miller, Rashid & Sinert, 2011)." However, Guillian-Barre syndrome is predominantly fatal as it causes both respiratory and cardiac failure (Miller, Rashid & Sinert, 2011). In the case of Sack's patient, the speed of the onset was similar, but the systemic failure was not present. The result was only the loss of proprioception, the exact sensory component generally left untouched by Guillian-Barre. By cross-referencing these specific symptoms of proprioceptive loss with nerve location and function, the damaged areas became apparent, and the nature of the mystery polyneuropathy slightly more clear.

The first system affected by the unknown polyneuropathy was the dorsal columns. This part of the somatosensory system relays "well-localized touch, pressure, vibration and joint position" from the arms and legs to the somatosensory cortex in the parietal lobe (Swenson, 2006). The impairment of this conscious joint position relay system would account for the wandering limbs, and without being conscious of where your limbs were, then, as reported, it would not feel like your body. Compounding this with the revoked sense of ownership and the impaired sense of touch and pressure levels, the limbs begin feeling distant from the owner, even though they could transmit slight pressure and touch. Ultimately, the disabling of the dorsal columns rendered conscious feeling of the body's presence and position unavailable, making what was once familiar, alien. This, however, was only half of the problem.

Upon investigation of the remaining symptoms (the unsteadiness and the jerky movement), the dorsal spinocerebellar tracts are undoubtedly the second area to have been lost to Sacks' observed polyneuropathy. The dorsal spinocerebellar tracts are responsible for the unconscious senses of proprioception, "[transmitting] information necessary for the maintenance of normal muscle tone and posture as well as for coordination," in addition to "information if movements are to be performed smoothly (Swenson, 2006)." The damage to these specific somatosensory functions account for the patients' jerking movements and inability to grasp objects, as well as the unsteadiness and eventual inability to coordinate smooth movement unconsciously. Sacks, though correct in his original diagnosis, was only equipped with the medical knowledge of the late 1970s at the time of writing his account, and could not have identified these specific areas as is now possible.

So far, it is understood that a mysterious polyneuropathy affected the patient in a rapid manner, disabling the dorsal columns of the spinal cord in addition to the dorsal spinocerebellar tracts. Due to this loss of function, she was unable to consciously feel the position of her body or unconsciously control the fine movement of her limbs, the loss of the body's "eyesight (Sacks, 1985)." The lack of both

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the conscious and unconscious feelings left her in an unfamiliar, unfeeling shell, but it did not remove her ability to function completely. Compensation for the body-blindness came with the careful and deliberate visual observation of motor function (Sacks, 1985). Though mobility and functional life was not impossible, they required constant attention and compensation with other unimpaired senses of vision and balance.

The loss of proprioception is a topic that is not often addressed, for as Sacks astutely wrote, "the body, normally, is never in question: our bodies are beyond question, or perhaps beneath question – they are simply, unquestionably, there (Sacks, 1985)." Popular culture would seem to believe that the body is but a shell. Science fiction continues to imagine that we could transplant our brain, or consciousness, into another body and continue to live a content and unending life. The questions are, though, why is our body beyond question? Is there some advantage to the ownership of our 'shells'? Why do we have such an unaffirming, construed, and taken for granted, view of what and who we are?

One might stand to say our bodies are out of the question because since the moment we were born, there has been proprioceptive input that has formed our own body image over time. For the vast majority of the population there has never been and never will be a moment during which feelings from the body are missing or the location of a limb unknown. Due to this experience of constant conscious and unconscious sensory-motor feedback, we have fully integrated our consciousness into this vessel, our body. It could also be that every moment of our life experience, conscious and unconscious, has wired us neurologically into our bodies with every increasing and compounding complexity, as we hone the skills we learn with this particular 'tool' of existence. Thankfully, the body is neither just a tool nor just a shell.

The body is, by what is seen through the investigation of the loss of proprioception, an extension and entire facet of our self. We cannot hop back and forth, as science fiction or lofty dreams of medical advances would have it, from body to body because sensory feedback would differ. Information exchange would not coincide with the imprint our own bodies have on our minds and our neural circuits. The advantage to being so bound to our individual bodies is that we both protect them and regard them as our true form (beyond the thought of being only neural impulses in a brain). To us, the body and the self are closely knit, as can be seen by a simple scenario. If I were to prick you with a pin, would you tell me to stop poking you, or to stop poking your body? Most would reply with the first exclamation (and possibly profanity), "stop poking me!" Therein lies the evidence. You would not say that your body felt pain but that you did. The ownership of the pain was personal, not distant. For with our bodies, our 'selves,' the purpose of this sense of ownership and integration is one of self-preservation, continuation, and likely reproduction. This integration is surely an advantage over evolutionary ancestors who may not have developed such an advanced sense of integration with their bodies.

The common figure of speech, "you do not know what you have until you lose it," is true concerning the facets ownership and control. As time has taught, the body is not an object to which we question ownership; it is our own. Because of this, we take for granted that speech, gait, and countless other basic functions are guarantees. None of these abilities ever considered beyond the whim of an action command in the pre-frontal cortex, and that has been the tale of our existence since we struggled to learn to move with precision and unacknowledged elegance.

Thankfully, we cannot remove from ourselves our bodies willingly and contaminate the value of this essential need for our existence and individuality. Thus, it seems that science fiction will have to remain fiction and the medical dreams of body replacement unreachable, shown by the patient of Oliver Sacks and her loss of proprioception. Her body became alien to her, and revealed, from the observation of her struggle and condition, insight into the reasons why we refrain from questioning the integration into our physical form. Moreover, it divulged reasons for the strong sense of self-preservation and body-ownership we possess, and why we should undoubtedly appreciate that which we never do, the body. We are our bodies; our bodies are who we are. The two are inseparable.

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