Sound Neuroscience: An Undergraduate Neuroscience Journal

Volume 2
Issue 1 *Women in Neuroscience*

Article 4

2015

Untitled

Kristina M. Lewin
University of Puget Sound, klewin@pugetsound.edu

Kristina Lewin

Neuroscience 201

"I am assuming that if we understand the brain, then we will understand the nature of knowledge […] and we will understand the nature of consciousness" Patricia Churchland (*1*).

Patricia Churchland is a pioneer in the fields of neuroscience and philosophy. Describing herself as a neurophilosopher (*8*), her assiduous work has been dedicated to the creation of a continuum between the two disciplines. She currently works as a philosophy professor at the University of California, San Diego. However, her research straddles the intersection between neuroscience and philosophy quite equally, as is evidenced by her many publications. Spanning more than four decades, her writings attempt to apply the science of the brain to the unknown and indescribable nature of the philosophical self (e.g. identity and morality) (*8*). Churchland suggests that a tangible idea of consciousness, morality and reason exist and when we better understand the brain, we will be able to perceive exactly what makes us who we are.

Churchland teaches numerous courses in philosophy at U.C. San Diego, including "Morality and the Social Brain" and "Ethics and Society". Additionally, she offers courses that highlight her research focus of neurophilosophy, such as "Science and Morality". She has won a number of awards and grants, including the National Science Foundation Grant in 1987 and the MacArthur Foundation Research Fellow from 1991 to 1996. She has participated in many professional societies for neuroscience and philosophy, as well as holding several office positions within said societies. Examples include residing as president over the Society for Philosophy from 1984 to 1985 and serving as chair for the executive board of the Institute for Neural Computation (UCSD) in 1994. Her curriculum vita is obviously impressive, but even more so considering that her official education does not exceed a Master's degree nor does it include formal study in neuroscience (*8*).

Interestingly, much of Churchland's early writing serves as theory or predictions of what may come to be in the field of neuroscience. As she began her research in the 1970s, the science of the brain was still largely unknown. Neuroscience continues to develop, but we still do not have concrete physical evidence of where consciousness is formed. Even now, her research strives to cultivate open-mindedness among her readers and fellow philosophers, through the

relaying of studies she believes illustrate the mind-brain connection. In an earlier work entitled, "A Perspective on Mind-Brain Research", Churchland describes what she sees as the contention of philosophers to accept cognitive explanation (*6*). She suggest that her colleagues are either "principled non-believers" in that they are unable to accept that the study of the brain has anything to offer the study of the self, or are "boggled non-believers" in that they are so overwhelmed by the massive amount of information to be uncovered from neurons that they assume connections are too far off to begin thinking about now (*6*).

Later publications attempt to connect the disciplines by suggesting questions for neuroscientists that could provide relevant and belief-modifying answers for these headstrong philosophers. One such question being, "[h]ow do structural arrangements in neural tissue *embody* knowledge?" (*4*). There is a huge gap that exists between what is innate and what is experienced. Churchland insists that these categories are neither "exclusive" nor "exhaustive" (*4*) and to error in that assertion, is to ignore a much larger explanation. Here she indicates that it will take a combination of many disciplines to truly understand the mind-brain connection. Not only will we rely on neuroscience and philosophy, but also biology and psychology will be necessary to attain a true understanding of human nature and consciousness. She insightfully states, "differences do not sort themselves into archaic 'nature' versus 'nurture' bins, and that genes and extragenetic factors collaborate in a complex interdependency" (*5*).

In another thought-provoking piece, Churchland tackles free will and its relation to neuroscience (*2*). This is particularly interesting because she offers her opinion on a question posed by many curious observers: if our genetics make up our brains and our brains control our actions, then are we really responsible for the outcome? Can we blame a pedophile or a thief for simply acting on the impulses of his/her consciousness? How do we punish such actions if individuals are merely carrying out their hard-wired desires? Her answer is both astute and relative to societal living. She suggests that lack of control does not constitute a free pass; it merely indicates that individuals without said control must be efficiently treated (e.g. medication or therapy) or held outside of the boundaries of the society that does not allow such behavior (e.g. in prison), so as not to impart such actions on the society that deems them unacceptable. She indicates that "explanation is [not] tantamount to an excuse," (*2*) to illustrate her point that we must still be held responsible for our actions in order to participate in a functioning society. This necessity is based on the requirement of mutual trust built into communal engagement.

Learning more about the connection between self and the brain might allow for more effective treatments to be created. However, she does point out that the possible downside to this approach is that we open the door to "treating" eccentricities or quirkiness (*2*).

New information in neurological research has influenced recent works by Churchland where she investigates causal relationships of the brain and "determination, resolve and will" (*3*). She looks at experiments that stimulate portions of the brain electrically to elicit specific reactions. Neuroscientists are able to provoke fear, anxiety, and determination simply through electronic stimulation. The exact same regions in the brain that are stimulated as a result of an experience can be manipulated manually, indicating that the reason we act in certain ways can be explained simply by our network of neurons. She goes on to discuss other electrical impulse experiments that create experiences regarded as consciousness, such as a distortion of faces but not other visual inputs (*3*). These examples serve to illustrate how consciousness may someday be fully explained by a better understanding the brain.

Patricia Churchland is a remarkable woman, an inspirational figure for other women, as well as scientists and scholars alike. She works and writes as a philosopher, but does not shy away from pointing out some of the problems inherent in the discipline. While readers can anticipate that her assertions will generally side with the explanations of neuroscience, she poses intriguing questions that deal with our notions of the philosophical self. Although the progression of her publications indicate a shift in her belief that everything will be explained by science eventually to an awareness that the complex networks of our brains may never be fully understood, she still holds fast to the idea that there is more to consciousness than an abstract idea.

References

1. Being Human. "Patricia Churchland on neurophilosophy: is consciousness just chemistry." Interview with Bill Moyers. (2009). Retrieved from: http://www.beinghuman.org/article/patricia-churchland-neurophilosophy.

2. P Churchland, "Free will matters." *AJOB Neuroscience*. **2**(3):1-2. (2011).

3. PS Churchland, "Exploring the causal underpinnings of determination, resolve, and will." *Neuron*. **80**(6):1337-1338. (2013).

4. PS Churchland, "The impact of neuroscience on philosophy." *Neuron*. **60**(3):409-411. (2008).

5. PS Churchland, "How do neurons know?" *Daedalus*. **133**(1):42-50. (2004).

6. PS Churchland, "A perspective on mind-brain research." *The Journal of Philosophy*. 185-207. (1980).

7. PS Churchland, TJ Sejnowski, "Perspectives on cognitive neuroscience." *Science*. **242**(4879):741-745. (1988).

8. University of California, San Diego. "Webpage of Patricia Smith Churchland." Philosophy faculty. Updated 2006. Retrieved from: http://philosophyfaculty.ucsd.edu/faculty/pschurchland/index_hires.html.