Speaking on Behalf of a Brain That Changes Itself

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Not often in the realm of popular neuroscience publications, does a manuscript appear that can be simultaneously praised for its readability, humanity, and insight. Nonetheless, Norman Doidge, M.D., accomplishes precisely this in his revealing exposition on neuroplasticity, *The Brain that Changes Itself.* Doidge, himself a prominent psychiatrist, explores this burgeoning neuroscience by interviewing practicing neuroplasticians and providing narrative accounts of their acclaimed successes in promoting neuroplastic change. *The Brain That Changes Itself* asserts itself as a strong and appealing piece of literature through numerous aspects of composition. Foremost, Doidge's graceful use of language not only lends flowing readability to the piece, but sparks the reader's interest in neuroplasticity by humanizing the topic. Furthermore, Doidge provides a comprehensive outlook on neuroplasticity's applications through his interviews with various neuroscientists without going over the reader's head with excess jargon; however, the portrait of neuroplasticity he paints is uniquely tinted by his own background in psychoanalysis. Finally, the exposition hits home with the notion that ultimately cultural diversity is but a consequence of neuroplasticity, bridging the gap between neuroscience and sociology.

Already established as a distinguished writer - a prior columnist for the *National Post* & editor-in-chief of The Canadian Review of Books - Doidge extends his linguistic craftsmanship to *The Brain That Changes Itself.* The work of each neuroscientist interviewed is presented as a novel with Doidge himself giving detailed narration of exciting discoveries. In an interview with cognitive neuroscientist Jordan Grafman, Doidge grasps the reader's attention with a narration of Grafman's first experience witnessing neuroplastic recovery in a stroke patient he treated.

> "She started to move more and became more communicative and more able to concentrate and think and to remember day-to-day events….Though she never completely recovered, Grafman was amazed by her progress, saying these interventions, 'had so improved the quality of her life that it was stunning'" (274).

The text is also a smoother read because Dr. Doidge avoids bogging down the reader with complex terminology, but if he does, a thorough and simple explanation of its relevance is given. Doidge's interview with Dr. V.S. Ramachandran on phantom limb pain forces lead Doidge to discuss the disorder "reflex sympathetic dystrophy," which he defines very fundamentally, and relates to Ramachandran's theory on the neuroplastic phenomena of pathological guarding. This basic, yet enthusiastic prose represents an accessible take on an otherwise daunting subject matter.

Doidge also stirs the reader to empathize with the patients whose lifestyles were improved by neuroplasticity. One of the first tales of perseverance told is of Barbara Young, who struggled all her youth with a learning disability characterized by a lack of spatial reasoning, a narrow field of vision, and deficit kinesthetic perception. However, her story was one of personal accomplishment as she learned that through vigorous mental training she could correct many of her shortcomings and help others who needlessly suffered from similar neural defects. Additionally, through these stories, Doidge asks the reader to appreciate how quickly the tables can turn between being the caretaker and the one receiving care. In his investigation of Edward Taub's Constraint-Induced (CI) therapy for stroke, Doidge tells the tragic case of Michael Bernstein. Dr. Bernstein, once a prominent eye surgeon, had his career as a surgeon crippled by a stroke; however, CI therapy gifted him use of his limbs again to run his practice, despite permanent damage to his motor cortex. These personal accounts of neuroplasticity's life altering impact stimulate the reader to venture on to more tales that tug at the heart strings; more importantly though, they teach the one to value the potential clinical benefits of scientific research.

Beyond its humanity, *The Brain That Changes Itself* benefits from a strong and varied base of content. Doidge runs the gamut in his investigation of neuroplasticity, interviewing the neuroscientists who have made diverse and monumental contributions to the field. He dives deep in to the realm of neuroplastic perception with Paul Bach-y-Rita, who exploits plasticity through sensory substitution, giving sight to the blind via devices that pattern visual experiences through touch. He then explores the roots of neuroplasticity with its most notorious proponent, Michael Merzenich - the man responsible for painstakingly demonstrating plastic change through microelectrode mapping of individual neuron functioning over time. Doidge even explores how neuroscientists like V.S. Ramachandran use optical illusions to treat the sensation of pain in individuals with phantom limbs.

This literature's content is further personalized by Doidge's subtle flavoring with a hint psychiatry and psychoanalysis. He devotes an entire chapter to exploring how, through plastic change, people develop preferences in their personal relationships. Along this vein, he suggests how unhealthy preferences could be molded by psychoanalytic therapy. Although even in his phenomenological psychoanalytic perspective on the matter, he cites hard scientific evidence to validate his case studies, providing the molecular mechanisms behind human feelings. Doidge makes us all feel like mindless, smitten prairie voles under the influence of oxytocin, yet acknowledges our capacity for change in spite of these feelings.

Nonetheless, the greatest highlight of Doidge's work lies in its appendices. Here, Doidge expounds on the overarching theme that plasticity affects everyone; in this instance, he does it by delving into culture. He begins by asserting that neuroplasticity validates culture's existence by allowing our neurons to form networks and connections according to our shared or unique experiences. At one extreme, it facilitates the birth of human language during critical periods in our childhoods. Simultaneously, Doidge about-faces and notes that cultural aspects, such as the media, determine individual neuroplasticity by favoring the dominance of different senses (i.e. touch, sound, sight). Concluding on a philosophical note, *The Brain That Changes Itself* concedes that it may be changed by other brains too.

In summation, *The Brain That Changes Itself* is a worthwhile read for anybody curious about how experience shapes human identity or, better yet, neuroscience. Norman Doidge, M.D. sketches a comprehensive, linguistically appealing look at the ever-changing field of neuroplasticity. More importantly, he creates an accessible portrait of neuroplasticity that glows warm with human empathy. I

*This author wrote the paper for Biology 480: Neural Frontiers taught by Dr. Shubhik DebBurman.

wholeheartedly encourage everyone to read *The Brain That Changes Itself* - you will walk away with a stronger sense of what it means to be human.

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