

## The Brain Can Do What?! A Review of *The Brain That Changes Itself*

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For the majority of people, the complex interplay of molecules and electricity occurring in their brains during every action or thought goes largely unnoticed. People are quite happy to go about their lives without acknowledging the incredible three pound organ sitting inside their skull. However, for those who are interested in that spongy mass, *The Brain That Changes Itself* is one book that cannot be missed. Dr. Norman Doidge weaves together a number of remarkable stories that demonstrate a groundbreaking idea that has just recently began to gain ground in the neuroscience community: that the brain is capable of plastic change. For many years, the idea that the brain was static reigned supreme among neurologists. Your brain grew throughout childhood, but once puberty ended you had all of the neurons that you would ever have, and from this point on it was a downward spiral. This idea was based mostly on the fact that the brain had not exhibited an ability to repair itself like other organs. While tissues such as muscle and skin could readily repair damage, the brain seemed to only have a limited supply of neurons, and that supply slowly decreased over time.

Doidge brilliantly demonstrates the emerging idea that the brain has the capacity to respond to change with a series of stories about doctors and their patients. Thankfully, the author keeps the tales from becoming repetitive, as each story presents brain plasticity in a fresh new way that keeps the reader intrigued, and more importantly, demonstrates how completely involved our brain is in all the activities of life. Each story is different, spanning the recovery of stroke victims who regain function of their paralyzed limbs to the source of pain in amputated appendages. In one of the best examples of Doidge's varied stories, he discusses how obsessive compulsive disorder (OCD) can be treated using an approach based on brain plasticity. OCD is essentially a problem with the brain shifting gears, and Doidge relates the story of Dr. Jeffery Schwartz attempt to teach the brain how to manually move past this brain lock by forcing the patients to focus on something other than their compulsive worries. Doidge stresses the idea throughout the book that, "Neurons that fire together wire together." The hope is that forcing OCD patients to associate their OCD with another more enjoyable activity will allow their brain to finally shift by rewiring the brain circuit that gets locked up. Several real life examples of this therapy are given, and all of the people treated have shown vast improvements.

On the same note, another excellent aspect of the book is how Doidge uses real life examples to illustrate examples of brain plasticity. The book could have easily degenerated into a mess of hypothetical examples of brain plasticity that would bore the reader to death and fail to make the reader connect to it on a deeper level. Instead, emotional portraits of the real, living characters are painted and, as a result, you connect with them and feel as though you are sharing their experience. These people are not imaginary characters invented to serve the purpose of the story. They are real human beings, most of whom have gone through incredibly difficult periods in life. The story of

Michelle demonstrates how easy it is to sympathize with the characters. Michelle is a young woman who, on the outside, appears fairly normal. An uninformed observer would never imagine that Michelle was born with only half a brain. As a result, she has an awe-inspiring ability to remember even the tiniest details from events that occurred several years ago and could even calculate what day of the week the event took place. Her brain had changed to utilize the space on her right hemisphere for tasks that were typically completed by the left. However, as a result of her condition she had problems communicating and socializing in a normal manner. She had no interest in the opposite sex and had no real friends. However, it was not Michelle's behavior that fostered her loner lifestyle. It was that "normal" people didn't have the ability to function around someone with a disability. Stories like this truly help the reader connect with some of the subjects who have had difficult lives.

Yet some stories told were much more inspiring than Michelle's. Much of *The Brain That Changes Itself* focuses on stories that emphasize how people can exceed limits placed on them by their conditions because of the brain's plastic nature. One of the most debilitating afflictions the brain can experience is a stroke, a condition in which the brain is deprived of oxygen. The book tells the story of Michael Bernstein, a doctor who experienced a stroke that paralyzed the entire left side of his body. He survived, and underwent the typical stroke rehabilitation program that hospitals provide without making significant progress. The old recovery program was based on the idea that not much can be done for stroke victims. However, he found a program that used restraints to force stroke victims to relearn how to use their afflicted muscles, and during the program he improved dramatically. The restraints forced his brain to re-activate the brain maps that had atrophied during his recovery. He now writes his name like he used to and even plays tennis three days a week. More than just a story about brain plasticity, Doidge illustrates that humans, if they are determined enough, can overcome even the most devastating blows that life delivers.

Although the book is written well, it still has room for improvement. Perhaps one of the most obvious ways that the book could be improved would be to provide small diagrams of the brain areas that Doidge talks about. Disorders of the brain are very complex, and simply describing them in words to the reader is most likely not sufficient for them to fully understand. A simple visual guide with labels would greatly enhance the ability of the reader to understand what is happening inside the brain. They could be incorporated as simple labeled sketches of the brain regions being discussed scattered throughout the chapter. For the more complex disorders, a simple diagram illustrating what has gone wrong would be immensely helpful.

Overall, Doidge does an exemplary job illustrating the notion that the brain is able to change as needed. He employs real life examples that, in addition to providing great support of plastic theory, make the reader connect with the characters. A majority of the examples demonstrate more than just brain plasticity. An underlying theme of the book is that humans are capable of so much more than we realize. All it takes is a little adversity to unlock our true potential. His ideas are presented in an accessible and interesting manner that makes the book a great read for the average book worm or a PhD candidate. Doidge has used his knowledge of neuroscience and storytelling abilities to craft a book that mixes cutting edge science with an intriguing story

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that will keep readers flipping the page. The only disappointment that will come is at the end when they realize that there are no more pages left to turn.

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