

Plasticity: Importance of Use it or Lose it

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Our brains have fascinated scientists around the world. From our ability to learn, memorize or adapt, it is clear the brain can do incredible things. Our brains are plastic; they are adaptable and malleable. We can alter our neural pathways, creating paths that are more or less likely, depending on how often we utilize these paths. That is where the saying “use it or lose it” comes into play.

The book *The Brain that Changes Itself* by Norman Doidge uses the idea of plasticity to address several disorders of the brain that have puzzled scientists. Each chapter addresses a new idea relating to plasticity, from OCD to imagination. Doidge engages the readers by using specific stories and bringing in quotes from several experts, all the while keeping the readers interested by using several metaphors and comparisons.

Obsessive-compulsive disorder (OCD) is a disorder that crosses the bridge between anxiety and addiction disorders. Those with OCD are plagued by obsessions, such as fear of getting a disease or fear of hurting a family member. To best control these obsessions, people with OCD tend to rely on compulsions, such as doing things in multiples of three. If compulsions are avoided, anxiety rises in someone with OCD. Doidge discusses how using the human brain’s plastic capabilities can address, and maybe even cure, OCD. While discussing OCD, he brings up the newfound treatment developed by Jeffrey M. Schwartz. Schwartz’s method involves first addressing that the obsessions and compulsions are due to OCD rather than for example, a fear of picking up a disease. By following this idea, one can attempt to actively reroute the brain. One way to alter the brain’s pathways is to effectively use the concept “use it or lose it, consequently altering OCD behaviors. Doidge uses metaphors throughout the book to help the reader understand the brain regions involved in OCD. For example, he describes the caudate nucleus as “the automatic gearshift”, thus comparing the brain to an engine that can actively alter brain pathways: “Schwartz wondered whether patients could shift the caudate “manually” by paying constant, effortful attention and actively focusing on something besides the worry...” (170). By comparing the caudate to a gear shift, the readers have a better understanding of how the brain functions and malfunctions.

Doidge furthers the discussion of plasticity by mentioning some of the downsides. To do so, he primarily talks about phantom limbs in which patients develop pain from limbs that are no longer present. For phantom limbs, Doidge discusses V.S. Ramachandran who developed a popular treatment method for phantom limb pain using mirror boxes. The mirror box is used for patients to feel as if their amputated limb is present again, which can serve to “unlock” the pain. In this case, Doidge uses the metaphor of “gates”. He writes, “Their ‘gate control theory of pain’ proposed a series of controls, or ‘gates’, between the site of injury and the brain” (190). Furthermore, Doidge uses specific cases to create a sense of empathy between the reader and the patients mentioned, such as the patients Philip Martinez and Tom Sorenson. This sense of empathy helps make the book even more relatable.

One of the most interesting chapters of this book is on mental retardation. The chapter focuses on Barbara Arrowsmith Young, a woman who grew up having a mental disability that left her unable to read clocks or understand grammar. Due to her struggles, she went on to create the Arrowsmith School which uses techniques to strengthen the weakened areas of the brain. Today, she is very successful and has helped several other students. Doidge uses most of this chapter to go in depth about Young, bringing in prominent figures in the field. Once again, Doidge explains this case of plasticity as “a classic case of ‘use it or lose it’” (42). He furthers the potential for overcoming learning disabilities by mentioning specific case studies from the Arrowsmith School.

The chapter on love and plasticity focuses on the adverse effects of pornography, how our parents influence our love life and how passion seems to be lost. Doidge uses a comparison throughout this chapter, describing how passion seems to fizzle out and the negative effect pornography has on relationships. He uses a comparison of drugs

and addictive behavior as well to help explain the complex neurobiology of passion and the adverse side effects of pornography on relationships. For instance, Doidge explains how addiction shapes the human brain and strengthens specific neural pathways, making behaviors more likely while dampening reward since the reward pathway becomes desensitized.

Another chapter begins with a specific case study of Dr. Bernstein who had a stroke at 54 years. He found his left side completely paralyzed but after going to the Taub Institute, he regained much of his ability, including his ability to play tennis. Once again, the treatment targeted the brain’s ability to be plastic. Doidge states, “Taub’s treatment changed all this by helping stroke patients rewire their brains” (Doidge, 136). This chapter brings in the interesting case of Taub and his struggle to bring his treatment into fruition in the medical world as well as the difficulties of succeeding in research. To further explain research on strokes and how plasticity works, Doidge uses a comparison of forcing the use of a damaged arm or leg by binding the good arm or leg; that is similar to putting oneself in a country where one does not know the language. Similarly to someone adapting to learn a new language, one adapts to using an injured body part.

Lastly, chapter eight emphasizes how powerful our thoughts and imagination can be. Doidge uses specific studies to help illustrate how powerful our neural circuits are and ways to strengthen them not just by doing but also by thinking. One study illustrates that those who think about playing the piano and those who play the piano both perform close to equal after five days. Another interesting statistic is that subjects who performed a specific physical exercise increased muscular strength by 30 percent while those that imagined doing the exercise increased muscle strength by 22 percent. These interesting studies ultimately captivate the reader’s attention.

Overall, although the book is comprised of 11 chapters, the author maintains a constant and well-preserved theme of “use it or lose it” throughout the book. The book is easy to understand and Doidge successfully explains more complex scientific terms. He also furthers arguments by using specific examples, providing readers with individual cases for each of the chapters. Although this novel is scientific, it is well-written and anyone can find this an enjoyable and easy read.

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