This is your Brain on Imagination

By Sophie Carmichael-Hanlon

American author Robert Fulgam once wrote, “I believe that imagination is stronger than knowledge. That myth is more potent than history. I believe that dreams are more powerful than facts. That hope always triumphs over experience” (1989, vii). The idea that imagination is a powerful thing is well known, as is the idea that fostering one’s imagination boosts creativity. But what else can it do? Imagination has been found to have a significantly positive impact on the brain by increasing neuroplasticity, and it has also been found to be effective in treating anxiety disorders. This essay will explore these findings before discussing a range of methods for fostering one’s imagination, such as role-playing games and reading fiction books. Although the emphasis on fostering imagination decreases as one leaves childhood, based on these discoveries it should be cultivated throughout one’s life—at the very least—in pursuit of brain health. From the neurobiology perspective, “imagination is the capability of neural circuits to combine in novel ways images with a direct perceptual origin and concepts to produce original images and speculations. Through imagination, we are able not only to anticipate future events to a certain degree but also to enrich our sense of the world and even conjure up alternative worlds, such as utopias” (Agnati, L. Et al, 2013).

Neuroplasticity refers to the brain’s capacity to change in response to our interactions with our environment, and these physiological changes are what drive our ability as humans to continuously adapt (NeuroHealth Associates, 2019). Evidence suggests that older adults have

less neuroplasticity compared to younger subjects, but evidence also shows that there are ways to drive neuroplasticity, and these are external and internal (Park, D. & Bischof, G., 2013; NeuroHealth Associates, 2019). External methods include trying something new like travelling to a new destination or reading a book outside of the genre you typically read or switching up your routine. As you take on these new experiences, your brain will continuously adapt and increase its neuroplasticity. Internal methods include practicing mindfulness, meditation, and cultivating one's imagination. Imagination is an extremely powerful method for this. Brain scans have shown that experiencing real situations and imagining them "activate many identical brain areas," so from the perspective of one's brain activity, imagining an act and doing it are not so different (NeuroHealth Associates, 2019). Although reading fiction is a physical activity and can be considered external, it also plays a role in strengthening our imaginations as we visualize the happenings of the book. This makes imagination intensely powerful for driving neuroplasticity, and as we grow older this is very important. Children tend to have active imaginations, and are often experiencing things for the first time, and as we grow older into young adults and beyond, we settle into routines and experience fewer new things. This isn't the only thing that imagination drives, though, and it has been found to help train how one responds to fear.

Imagination is powerful in the face of fear. On one hand, it can often exaggerate fear-inducing scenarios when the brain assesses potential threats based on bits and pieces of information, which results in an overreaction (Onians, 2018). But researchers have discovered that with guidance, imagination can be used to decrease or eliminate one's response to phobia triggers (University of Colorado at Boulder, 2018). In applying findings of the impact of imagination on neuroplasticity, researchers at the University of Colorado at Boulder have

discovered that “imagining a threat can actually alter the way it is represented in the brain” (2018). In comparison to participants continuously experiencing fear-inducing audio as a form of exposure therapy and participants imagining the sound, they found that both groups experienced the “extinction” of the fear response in their brains (2018). This not only proves the power of imagination, but also has the potential of far-reaching impacts on the future of treatment for anxiety disorders.

There are many ways to cultivate one’s imagination, but I will focus on practicing visualization training, play, reading fiction books, and daydreaming. For those who struggle with visualization and do not have a naturally active imagination, visualization training may be a good start. It involves going through exercises that over time will improve one’s ability to imagine (Sasson, n.d.). These exercises can take the form of sitting quietly and observing an object before closing one’s eyes and taking the time to form a clear image of it in one’s mind (Sasson, n.d.). Another exercise might be looking at a photo before closing one’s eyes and attempting to visualize as much of that photo as possible before looking at it again. Another excellent way to foster imagination is engaging in play regardless of one’s age, and role-playing games like Dungeons and Dragons are an excellent option because the narrative game involves significant visualization (Allen, 2016). Whether you are running the games as the Dungeon Master or listening to one, there are many opportunities to visualize the details of the game, such as what is in the line of sight of your player, what they can touch, and what they can smell (Mike, 2009). The reading of fiction books, particularly speculative fiction, is another way to cultivate one’s imagination as one becomes immersed in visualizing fictional worlds and

interactions (Allen, 2016). Finally, daydreaming can be practiced anytime, anywhere, and is an easy way to make fostering one's imagination an enjoyable daily habit (Allen, 2016).

Imagination is a powerful force that can and should be cultivated at any age in a multitude of ways. Throughout this essay, I have discussed the impact of imagination on neuroplasticity and its ability to train the brain's responses, as well as easy methods to train and cultivate one's imaginative ability. Although the cultivation of imagination is heavily emphasized for young children and decreases greatly for young adults and beyond, one should not take for granted its ability to strengthen one's neural pathways and positively impact one's life.

References

Agnati, L., Guidolin, D., Battistin, L., Pagnoni, G., and Fuxe, K. (2013). The neurobiology of imagination: Possible role of interaction-dominant dynamics and default mode network. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2013.00296

Allen, M. (2016, April 20). 10 surprising ways to develop your imagination. *Idea to Value*. https://www.ideatovalue.com/crea/melissaalles/2016/04/10-surprising-ways-develop-imagination/

Fulghum, R. (1989). *It was on fire when I lay down on it*. Villard Books.

Mike. (2009, June 1). Four Ways to Get Your Imagination Back. *Sly Flourish*. https://slyflourish.com/four_ways_to_get_your_imagination_back.html

NeuroHealth Associates. (2019). What is neuroplasticity, and how can I help my brain get stronger? *Neurohealth*. https://nhahealth.com/what-is-neuroplasticity-and-how-can-i-help-my-brain-get-stronger/

Onians, J. (2018). Art, the visual imagination and neuroscience: The Chauvet Cave, Mona Lisa's smile and Michelangelo's terribilitá. *Cortex*, 105, 182–188. https://doi.org/10.1016/j.cortex.2017.10.009

Park, D. C., & Bischof, G. N. (2013). The aging mind: neuroplasticity in response to cognitive training. *Dialogues in clinical neuroscience*, *15*(1), 109–119. https://doi.org/10.31887/DCNS.2013.15.1/dpark

Sasson, R. (n.d.). Training Your Visualization and Imagination – Some Tips. *Success Consciousness*. https://www.successconsciousness.com/blog/creative-visualization/training-and-developing-visualization-and-imagination/

University of Colorado at Boulder. (2018). "Your brain on imagination: It's a lot like reality, study shows." *ScienceDaily*. https://www.sciencedaily.com/releases/2018/12/181210144943.htm