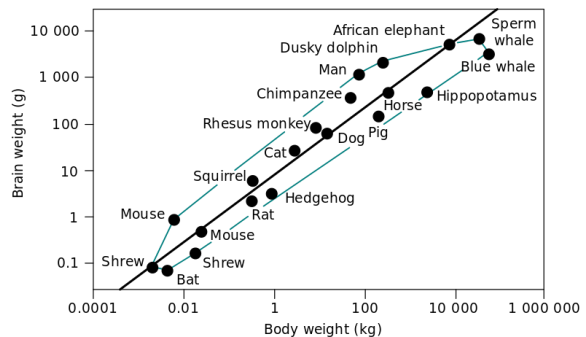


The Brain-Environment Relationship: Part II

The human brain is truly one of the most brilliant creations of evolution. When compared with the brains of other animals, the human brain shines amongst the top categories having one of the largest brain-to-body ratios (see graph). For all its brilliance, the brain requires us to pay a hefty sum as 20% of our daily caloric intake goes towards energizing its activities (Henneberg, 1998).



So, what is the brain doing for it to make such audacious energetic demands? Well, for one, it keeps you alive without pushing you to put much thought into it. Think about all the survival processes that occur outside of your consciousness: heart activity, cellular respiration (breathing), digestion, etc. Your brain allows you to go on about your life without paying any mind to these rudimentary functions through automatic pathways. Great, but this is assuredly an incomplete picture because your brain does more than merely keep you alive. After all, you accomplish much more than just surviving your day. The following article will cover one of the tasks that the brain fulfills to make you the dazzling individual that you are.

The Ever-Changing Brain

Your brain is constantly learning, growing, and changing. Even as you read this, your brain is in flux trying to incorporate any new information with the one you already have banked in your memories, whereas any old knowledge is being strengthened (Sagi et al., 2012). This process is not exclusive to reading; it is an ongoing activity that occurs throughout the day. This ability of your brain to shape and mold new connections is called neuroplasticity. In simpler terms, your brain is plastic, i.e., malleable.

Here are some things that neuroplasticity can help you do:

- Learn new subjects and store them in the memory centers of your brain.
- Recover from minor to even severe brain injuries (Sophie Su et al., 2016).



- Regain lost functions after traumatic brain injuries and disorders (Villamar et al., 2012).
- Allocate new brain areas to substitute for permanently damaged ones – a necessary feat that allows individuals to regain quality of life after losing important functions/senses (Merabet & Pascual-Leone, 2010; Reichert & Schöpf, 2018).

Fascinating, but what is it that influences neuroplasticity? What promotes it and what hinders it? All are excellent questions whose answers have become the principal interest of many neuroscience researchers.

“Alexa, Turn on Neuroplasticity.”

Would it not be incredible if you could only command your brain to become more absorbent to information? How helpful would that be when trying to remember where you placed your keys this morning! Perhaps you would even want to turn off neuroplasticity when you come across something you do not care to remember such as when reading the Terms and Conditions of that website you signed up for.

Unfortunately, you do not have such dominance over your brain, and for the sake of a quick thought exercise: your brain controls you more than you control it. While you ponder how outlandish that idea is, here is a consolation: you can influence the neuroplastic ability of your brain.

As we speak, certain things in your external and internal environments may already be affecting your neuroplasticity – some without your knowledge and some you are conscious about.

1. **Toxins in the Air** – Exposure to environmental toxins such as particulate matter and cigarette smoke can trigger brain inflammation, a process that thwarts proper neuroplasticity (*Effects of Environmental Toxins on Brain Health and Development* | *Frontiers*, n.d.). In the indoor environment, toxins are habitually found in volatile household products (e.g., sprays, cleaning products). One example is formaldehyde.
2. **Social Relationships** – Whether it is with family or peers, relationships impact individuals significantly as we are a highly social species. This being a fact, social isolation and/or relationship conflicts can take a serious toll on the mental health of an individual, triggering anxiety and stress (see point 4).
3. **Alcohol Use** – It is no surprise that mind-altering substances also affect neuroplasticity. The “how” is complex, but in simple terms, alcohol is a neurotoxin that hinders the ability to form neural connections in the prefrontal cortex, a



fundamental region for many of our executive functions (Loheswaran et al., 2016, 2017).

4. **Stress** – What was once reserved for life-threatening events has now become an overly used process in the post-agricultural world. Stress has become an enormous part of our lives and oftentimes, it is caused by external, and therefore uncontrollable, factors. As it is, stress can already be challenging to cope with, but it turns out that it is just as bad for the brain. Studies show that stress can induce brain inflammation, and disrupt learning and memory pathways (Pittenger & Duman, 2008).
5. **Hormone Disruptors** – Your hormones can affect how easily your brain can develop new connections (Been et al., 2022). Given this fact, any factors that disrupt natural hormone cycles will undoubtedly affect the neuroplastic capacity of the brain.
6. **Gut Flora & Diet** – Research on the relationship between the brain and the gut is ongoing, but so far, researchers have found that diet, gut flora, and brain activity influence each other inextricably thanks to connected networks (Murciano-Brea et al., 2021).

Steps You Can Take to Boost Neuroplasticity

Based on what science knows so far, there are a couple of things you can do to promote healthy neuroplasticity. Below are some suggestions:

- Opt for natural cleaning and personal products. See: www.ecolivingguide.ca
- Stay connected to your social network and maintain positive relationships.
- Find stress management strategies to reduce your daily stress levels.
- Get 7-8 hours of sleep every night.
- Engage in relaxation practices such as meditation and yoga.
- Avoid alcohol consumption.
- Eat a diet rich in antioxidants and organic foods as much as possible. Avoid additives, colourings, flavour enhancers, and fast-food items.

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