

## **Increasing the Odds: An Examination of How Diet, Exercise, and Relationships Can Influence Brain Health**

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Aging. Simply saying the word aloud may bring a flood of negativities to the forefront of the mind. Perhaps you picture a woman whose skin is loose and overwhelmed by creases. As she stands up to greet you, her movements are frail. Conversely, perhaps you are one of the few who picture a woman who walks every Thursday evening, who cooks and hosts every holiday. How, you might ask, do two women from the same cohort find themselves on opposite ends of the aging spectrum? Can we influence our likelihood of becoming the latter of the two? The answer to both of these questions can be revealed through an eye-opening exploration of the connection between the mind and body. By maintaining positive attachments, implementing a nutritious diet, and exercising the brain and the body, it is possible to have a positive impact on the way in which we age.

When thinking about the human brain as just another organ, we may overlook the importance of our daily interactions with other human beings. Human beings, just as every other living system, have a necessary dependence on each other in order to maintain the species as a whole (Cozolino, 2009). It is through communication and complex human relationships that the human brain has evolved at such a rapid pace. In order to proceed in such a manner, it is essential that we maintain these social aspects of the brain. As the human brain evolved, it reflected the increasing importance of human interaction. The human brain can be thought of as a social organ, being dependent on daily interactions and complex relationships with other human beings. Unlike any other species, human beings are defined by their relationships.

The 2009 publication “Participating in Activities – More Than Just Fun and Games” from the National Institute on Aging states:

A number of early studies found that people who are involved in hobbies and other social and leisure pursuits may be at lower risk for (and less likely to develop) some health problems, including dementia. They might even live longer.

By participating in different social activities we are able to form new and exciting friendships or relationships. The relationships we maintain allow us to give other people the opportunity to relate, compare, and contrast their experiences to our own. Almost all of our daily conversations involve a relationship of some kind — coworker, superior, teacher, student, mother, daughter, etc. Think about the last conversation you had with someone new. When asked about yourself, how did you respond? You probably mentioned that you were a mother, a husband, or a grandparent. Our relationships define us. But how does all of this tie into brain health?

From infancy, the relationships we have with people around us begin to mold us into the person we will eventually become. This is not only demonstrated through our morals, beliefs and customs - we are biologically influenced by those around us. In childhood, the synaptic connections between neurons in the brain are pruned and perfected as the child encounters new experiences and social interactions. One example of this type of pruning can be seen in Mark Rozenweig’s rat pup experiment. He found that when raising a rat pup in an enriched

environment - meaning, a cage supplied with wheels, tunnels, and exploratory toys – the rat pup experienced increased rates of learning, increased brain weight, greater number of neurons, and increased synaptic connections. This rat pup developed significantly different from his rat pup counterparts. Yet this neural influence is not only evident in early development. In adult brains the “same social brain networks remain plastic throughout life and are the very ones that adults rely upon to nurture one another, be good caretakers, and keep their brains alive” (Cozolino 35). Even in adulthood, person-to-person experiences can influence the wiring of the brain – particularly with regard to emotional attachment.

One of the most influential interactions that takes place is that of the child and caretaker. The child depends on the primary caretaker for survival and comfort. This results in the development of one of the most significant attachments between two human beings, which is not only beneficial for the child, but also for the caretaker whose same neural connections are stimulated by the attachment to the child. It is in this way that “we need children as much as they need us” (Cozolino 35). The human brain is hard-wired for human interaction and the benefits and results of such extend beyond the neural connections.

Attachment appears to alter the brain’s neural health. Positive skin-to-skin interaction between two human beings can release chemicals within the brain that help to maintain brain health and stimulate growth. This effect is also found in family, friend, and spousal relationships (Cozolino 36, 37). It is because of these chemicals that we “feel good when we are together and lonely and discouraged when we are apart” (Cozolino 36). No matter what your age, the connections we experience with other human beings have a direct relationship with the chemicals in the body that influence the reproduction of neurons and promote brain health.

For this reason, it is important to maintain positive relationships and continue to socially stimulate the brain. Doing so may increase longevity, quality of life and have a positive impact on brain health. Older adults should consider mentoring a child, spending time with family, or participating in a group activity. Relationships continue to define who we are as people and it is necessary that this trait be fueled and nurtured just as it is necessary to eat, sleep, and breathe. Establishing positive attachments is one of the simplest ways to improve brain health and increase longevity, but it is only one part of the puzzle. In addition to maintaining positive relationships, another way in which you can promote brain health and longevity is by maintaining a nutritious diet and regulating your food intake.

It is no secret that maintaining a nutritious diet will help to prevent obesity and the slew of diseases that accompany it. What is less obvious is the influence diet can have on brain health. When talking about diet and nutrition, typically the brain does not come to mind – though it should. One of the major purposes of food intake in the human body is to provide the energy required to maintain the processes to keep all of the systems and organs operating accordingly. The organ which uses the most energy is the human brain (The Scientific American, “Why Does the Brain Need So Much Power?”). In order to provide substantial nutrients to the brain, you merely need to take in the right foods. Because the majority of nutrients our body receives are obtained through the foods we consume. It is essential that we make what we put in our bodies count (Kirkwood 174).

Currently, there are four different categories found in foods that have been directly linked to promoting brain health (Cozolino 209).

Included are the following: antioxidants, folic acid, essential fatty acids, and phytoestrogen. Antioxidants - found in blueberries, strawberries, spinach and grapes, have proved to have a significant positive impact on brain health. From memory to coordination, stamina and balance, the benefits of taking in a sufficient amount of antioxidants are abundant. Folic acid tends to provide comparable benefits and, according to Cozolino, "appear to work against symptoms of Parkinson's and Alzheimer's disease" (209). Folic acid can be found in whole wheat, leafy greens, liver, oranges, and asparagus. Essential fatty acids can be obtained through salmon, flaxseed, soybean oil, and walnuts and are said to support cognitive function and work against forms of dementia. Finally, phytoestrogen (also found in flaxseed and soybean) has been found useful in fighting against the risk of Alzheimer's, supporting executive functioning such as decision making. Today, it is even more difficult to assure we are getting the appropriate nutrients into our bodies. Many foods we eat contain artificial ingredients and provide minimal nutritional value. As such, we need to ensure that instead of living to eat, we are eating to live by providing the body with what it needs in order to perform at optimum levels. When deciding what foods to put into your body, a considerable amount should fall under the above-mentioned categories.

Of course, we cannot talk about increasing brain health and longevity without mentioning exercise. Just as diet and exercise are good for your body, they are good for the brain as well. The brain and body rely on one another and as the body participates in physical activity it "exerts a stimulating influence on the entire brain that keeps it functioning at an optimal level" (Cozolino 211). Individuals that exercise on a regular basis can anticipate lower memory loss, lowered risk of dementia, and boosts in cognitive performance (Cozolino 211, 212). Exercise stimulates neural growth, specifically in the hippocampus, which has a direct influence on slower memory loss and lowered risk in dementia (Medical News Today, "Exercise Stimulates Neural Growth"). This is because the hippocampus is primarily involved in memory storage. The occurrence of neural growth due to exercise can be partly credited to a protein named IGF-1. IGF-1 is a protein that is released upon muscle contraction and influences the stimulation of neural growth (Massachusetts General Hospital. November 2006).

Increases in cognitive performance - including attentiveness and awareness, are largely impacted by aerobic exercise. Aerobic exercise stimulates vascular flow in the brain by increasing the amount of oxygen being supplied to the brain. Additionally, aerobic exercise provides improvement in "capillary health, longevity, and the growth and plasticity of the frontal lobes" (Cozolino 211). The frontal lobe is responsible for executive functioning and is typically one of the first areas to experience decline in normal aging adults. Plasticity within the frontal lobe is essential in order to maintain executive functions in aging adults. Plasticity can be understood as the way in which our brain adapts. This adaptation allows other areas of the brain to take over functions that the original area can no longer handle -whether it is due to neural damage or head trauma. The fact that exercise, by itself, can help to increase plasticity in the brain should be welcomed news for all of us, from young to old.

The scientific evidence concluding the benefits of physical exercise is astounding. Biologically functions, physical functions, and mental functions all improve with the addition of regular physical exercise. As the brain demands more oxygen (via more exercise), the brain demands more blood. As a result, the brain is able to operate at optimum performance and provide the individual with an improved overall bill of health.

Through a combination of secure attachment, nutritious diet, and

regular exercise, it is possible to take control of your own life and have a positive influence on your longevity and brain health. Each of the above mentioned suggestions can be put into action a little at a time, ultimately leading to a lifestyle change that will transform your life. Additionally, you do not have to wake up every morning and run 10 miles to reap the benefits of exercise. A simple brisk walk around the neighborhood on a regular basis will provide significant benefits related to brain health and longevity. With everything in life that is not guaranteed, it is refreshing to realize you can actually make a difference - and that difference will have a direct impact on you.

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