



May Education: Improve Your Brain Health

10 Best Evidence-Based Ways to Improve Your Brain Health

There are lots of crazy claims out there about how to become more intelligent or train your brain to be smarter or healthier, but what many people do not know is that many of these have been properly scientifically investigated, and some fairly persuasive evidence exists for many of them. So here are 10 ways to help you reach your full intellectual potential and improve your brain health, with each of the ten suggestions having at least somewhat respectable evidence in their favor. As we work our way down to number one, we will be considering techniques that are backed up with harder evidence.

10. Quit Smoking

Not smoking is one of the first steps you can take to improve your brain health. But smoking is not just any old bad habit. One Archives of Internal Medicine study published in 2010 followed 21,123 smokers from 1978 to 2008. Those people who smoked more than two packs of cigarettes a day had twice the rate of dementia when they were older. This was true even when the researchers controlled for other factors that could explain the results, such as education level, race, age, diabetes, heart disease and substance abuse. Those who smoked between half and one pack a day had a 44 percent increased risk of developing dementia. Even the lowest level of smoker had a 37 percent increased risk. The good news is that those people in the study who used to smoke but stopped had no increased risk of dementia and had normal brain functioning into old age.

9. Have Good Relationships

One particular form of memory that we practice in relationships of all kinds is known as “transactive” memory, a concept first developed by psychologist Daniel Wegner in 1985. This is a form of memory in which we become an expert in one particular type of information and often have sole responsibility for it. For example, at a party your spouse may be excellent at remembering someone’s job and taste in music once he is introduced, but he may be close to useless at remembering faces and names even if he has met someone before. So couples often work as a team, with each being relied upon to be expert in their area of talent. While each partner may struggle without the other, together they appear to have no problems at all remembering anything in social situations. And so each partner benefits from the relationship in never feeling forgetful and always knowing what to say.

And it turns out that the more diverse your friends are in type, the more they challenge you to think creatively. They provide you with information you would not normally have and they give you different perspectives on everything. Your friends figuratively keep your mind open.

8. Think Positive

There is a well-known effect in the psychology of education referred to as the “Pygmalion effect” (after the Greek myth Pygmalion) whereby teachers, often unknowingly, expect more of particular children, who then in turn strive to meet those expectations. This effect is so well known that it is referred to by psychologists as the Rosenthal-Jacobsen 1968 finding after the two psychologists who first discovered it. What this research suggests is that if we set high standards for ourselves and are helped believe that achieving them is possible, they become possible. On the other hand, children who are made to feel that there is little point in them trying to reach high standards give up easily and do not reach their potential.

In one study, by social psychologist Arronson and colleagues in 2001, members of an educationally disadvantaged community were taught to believe that it is possible to become more intelligent. The children from that group showed improved mathematical ability compared to a matched control group of children who were not encouraged to raise their expectations of what is possible. So positive attitude counts.

7. Get Quality Sleep

The brain does not shut off when we are asleep. There is a lot of work going on while you sleep and much of it involves consolidating the learning that took place during the day (see work by Walker, Stickgold, Alsop, Gaab, & Schlaug, 2005). Psychologists have long understood that our dreams, for example, are really just a reflection of all the work our brains are doing trying to make sense of all the information we have been taking in but have not yet fully interpreted and made sense of. So if this is true, you really can solve problems and make sense of things by “sleeping on it.” On the other hand, if you do not sleep properly, you can lose the benefit of your learning experiences. You also will not learn as well the following day. Adults need between seven and nine hours of sleep each night to benefit fully and perform at their cognitive peak each day. However, this method of keeping your mind sharp only makes number seven because there are now some scientific doubts about the

importance of what is known as “sleep consolidation” (see work by Vertes in the journal *Neuron*, 2004).

6. Eat Well

There are quite a range of food ingredients that are good for your brain and no end of marketing experts who will try to sell you the extracted ingredient in pill form or added to yogurt. But the truth is that many food components can increase our mental functioning. Ginkgo Biloba (extracted from the Ginkgo tree) has good effects on memory. Vegetables, such as broccoli, spinach, tomatoes, some berries, and the omega 3 oils found in oily fish (and some grains) appear to improve memory and overall brain function, as do green teas and protein in general. Protein, which we take in through meat, eggs and beans and peas (pulses), contain high levels of amino acids, such as tyrosine, which in turn cause neurons to produce the very important neurotransmitters norepinephrine and dopamine, which are associated with mental alertness.

The evidence is getting clearer on the effects of healthy diet and breast-feeding for an increased IQ. Mothers who breastfeed their babies for more than just a few weeks provide them with essential Omega 3 fatty acids that are generally not available in baby formula. The same essential oils are also found in fresh fish, so kids fed plenty of fresh food and grains, including fresh fish from as early as possible, have higher IQs than kids fed on formula and processed food. Perhaps the best evidence for this comes from a gold standard Randomized Controlled Trial study published in the *Journal Pediatrics* by Helland, Smith, Saarem, Saugstad & Drevon in 2003. That study compared the IQs of children fed on Omega-3 enhanced milk formula compared to those who were not. The researchers found that the IQs of the Omega-3 fed children were several points higher at four years of age—long after milk feeding had stopped.

A child's IQ is also helped by the diet of the mother, especially in the last trimester. If the mother eats a healthy diet high in omega 3 oils and feeds her infant well, that infant will gain several IQ points that will last a lifetime. A mother and infant diet based on processed meals and processed foods like fizzy drinks, cheap breads and cakes, may actually reduce your child's IQ below its expected level.

5. Meditate

In recent years psychologists have become more interested in some ancient wisdom around mindfulness and mediation. Some impressive evidence has started to come in that these practices improve our physical and mental health. Meditation techniques vary widely, but they all have in common some form of stillness, focus on breathing, and achieving calm.

Research is showing that meditation improves concentration and memory. Studies have also tracked the growth in important brain areas associated with intelligent thinking over time as research participants practiced meditation. In one study published in the *Journal Frontiers in Human Neuroscience*, Professor Eileen Luders of UCLA reported that long-term meditators were found to have larger amounts of gyration or “folding” of the brain cortex. The researchers did not prove it directly, but this process should allow the brain to process information faster and more efficiently. Another study by the same researchers and published in the journal *Neuroimage* in 2009 found that those of us who meditate have more cell density in the hippocampus (associated with memory) and frontal lobes (associated with forward planning and control of behavior).

Stress prevents good learning and it is designed to do so. The stress response prioritizes immediate information and actually shortens attention span. However, in order to think intelligently we need to think more broadly, and in a considered way. This is not possible when we are stressed. So meditation can help us to calm the mind, and so increase our ability to attend to each learning experience fully. Some studies also appear to show that extended practice can even raise our general intelligence.

4. Stay Healthy

It has come as a surprise to psychologists over the past decades that physical exercise is a sort of miracle cure or “panacea” for a wide range of physical, emotional and now intellectual problems. Exercise is free and there are no side effects. Physical exercise increases your blood flow, which in turn increases the amount of oxygen and glucose your brain is receiving. Exercise also generally involves physical coordination, and so your brain also gets a workout as it coordinates all of that complicated physical activity.

Exercise helps with the growth of new brain cells (neurons) and the connections between brain cells (neurogenesis) by promoting the production of three essential “growth factors,” called brain-derived neurotrophic factor (BDNF), insulin-like growth factors (IGF-1), and endothelial growth factor (VEGF). These factors also minimize inflammation, grow new blood vessels, and slow down cell self-destruction. A good workout can also awaken dormant stem cells in the hippocampus, a part of the mid brain that controls our memory system.

Some research seems to suggest that there may be genuine intellectual benefits to exercise in terms of IQ gains.

3. Maintain High Levels of Mental Activity

The more conversations you have with your child, the more intelligent they will be. Simple games involving naming objects and solving little puzzles together, making learning a social as well as an educational matter, improves a child's IQ. Talking to a child increases their vocabulary and that is really important for their general intelligence levels.

You can raise your child's IQ by six points by simply doing this over a few years when they are young. However, the evidence suggests it may be too late by age 4 to get these large benefits, so start early.

Kids whose parents read to them most days have higher IQs. The key, however, to an increased IQ is not just to read—but to read interactively to a child. That means that you should use an interesting and varying tone of voice, showing lots of relevant emotion as you read. Look for signs of interest or reactions in the child and ask them questions as you go, making sure the child understands what is being read. For example, you could stop and ask, “What do you think happens next?” You can also check to see if they can tell you the meaning of a word, or you can provide one for them. This makes reading a fun social activity and this is where the real IQ boost comes from. This is probably the simplest and most important thing you can do for your child and it is why TV and audio stories played from CDs or computers just will not do the trick! It turns out that kids need their parents! Engaging with stories is very good for a child's intellectual development, as very well documented in the text “What reading does for the mind” by Cunningham and Stanovich (1998).

But don't worry if you were never read to as a child. Exercising the brain and keeping mentally active is always a good idea. Fun activities like crosswords, Sudoku or whatever teases your gray matter, have long been suspected by neuroscientists to help improve your cognitive ability. Even struggling to understand a map, or a badly written flat-pack furniture assembly guide will exercise your spatial and reasoning abilities.

One of the simplest things you can do to make your brain sweat is to try to understand points of views that you do not agree with. Open your mind and listen to arguments that make no sense to you—and try to find some sense in them.

2. Extend Your Education

Many countries have early intervention programs (such as Head Start, in the USA) to provide intensive early education to children at risk. They seem to work for scholastic achievement to some extent but have not really been shown to improve a child's general intellectual ability. The main benefit of these programs seems to be that they provide a rich stimulating environment for the child and intensify their educational experience.

We can all do the same thing for ourselves and our kids by actively embracing problem-solving and learning every day. Take courses. Learn that second language. Read that heavy book you were avoiding. Even older children appear to show IQ gains if their environment becomes more stimulating and challenging.

The idea that our intelligence (or IQ score) is fixed for life is a controversial one, but evidence in support of this is weakening in light of several recent studies. One such study was recently published by Norwegian scientists Christian N. Brinch and Taryn Ann Galloway. They got around the problem of trying to separate the effect of education on IQ from the possibility that more intelligent people simply choose to have more education. Their study involved examining the effects of an increase in the duration of compulsory schooling in Norway in the 1960s. This change extended the minimum time in education for all Norwegians from seven to nine years. The authors cleverly hypothesized that the IQs of people who experienced this extra mandatory education should have increased by the time they reached adulthood.

The researchers had access to excellent records of cognitive ability taken by the military for all eligible males at age 19 and they used these to calculate the IQ of each individual in the study. This allowed them to show that IQ had risen by 0.6 of a point on average for all Norwegian males over the period of study, but had risen by 3.7 points for every extra year of education received. These findings provide very strong support for the ideas that education can increase IQ, but also that even those who are required to receive extra education will benefit from it.

1. Do Brain Training

Psychologists have known for quite some time that fundamental cognitive skills (for example the speed at which you process information) are fairly stable throughout our life and while we can often do more with what we have got, it's not so easy to improve your basic cognitive skill levels, at least until recently. Now the

latest player on the self-improvement scene is brain training, with all its neuroscientific gravitas and promises of genuine improvements to our fundamental cognitive skills, such as working memory and decision-making speed.

Brain training usually takes place on-line or on a hand held device and is delivered in the form of entertaining games designed to stimulate important areas of the brain associated with basic cognitive activity. Practice at these tasks lead to real changes in the cell density of those areas (neurogenesis). The idea is that we can literally boost our brains with the correct types of mental exercises. Because psychologists now know quite a bit (although not enough) about what brain areas are involved in what types of skills, they can devise exercises to target those precise areas so that, at least in theory, we can all become more agile thinkers, have more creative insights and reason more logically.

No doubt the field has become cluttered with all manner of charlatan riding the exciting new wave of interest in what is called "cognitive training" by psychologists. The media have made the lack of evidence for the merits of brain training a recurring theme in their pop science supplements. And it is true that many brain training companies make over-stretched claims that have even the most optimistic psychologists raising their eye-brows and cringing in discomfort. But that should not take from the basic fact that we are as certain as we ever are in psychological science that a stimulated brain develops more fully and quickly than an under stimulated one. We are also as sure as we can reasonably be that brain cell connections really do grow in response to stimulation and that stimulated brain areas are measurably better developed as a result. We are less sure that we can actually become more intelligent, insightful, and creative in our thinking as a result of brain training although all the evidence and theory points in the right direction. Some very high profile research published by Professor Susan Jaegii and colleagues has led to a high degree of confidence among psychologists that a task known as the dual N-back task can indeed raise at least one important dimension of intelligence, known as fluid intelligence – significantly and in the long term (at least several months). Still other work reported by Cassidy, Roche and Hayes (2011) in *The Psychological Record* reports IQ gains of 13 points or so for children exposed to a behavior-analytic form of intellectual skills training called relational skills training.

It is true that particular brain training products have not stood up to the rigors of scientific investigation but that in no way undermines the principle that psychologists are on to something big with brain training.

Decades of evidence from different laboratories, involving research with animals and humans all suggest that brains can be trained and developed by mental exercise. What is at issue is whether or not particular products can do this on their own and make changes where it matters; to our general intelligence, memory and mental processing speed. But because the benefits of brain training at this point in time appear to surpass those of any other method for enhancing intellectual ability, it gets the number one position in this list of top ten ways to improve your brain health and maximize your intellectual potential.

