

Chapter 26

Brain Train

The latest research on the human brain has turned up information I find simply amazing - and enlightening. Occasionally in my meandering recreational reading I just happen across knowledge that fills a gaping hole in my personal understanding of life and, for me, a serendipitous article I checked out in a science magazine did exactly that... and it inspired me to learn more.

It appears that brains, unlike hearts, lungs and other organs, do not develop as one whole unit but each region of the brain must undergo its own distinct form of development. The prefrontal cortex, for instance, is the most recently evolved region of our brains - and where we see the greatest improvements between our brains and those of other primates. It's both the area that regulates moral behavior - our conscience - and, at least as significantly, it's where conscious decision-making is headquartered. You can well imagine that proper development of this region is vital to having a successful life but, as new research is informing us, if we aren't trained in how to use it, we lose it.

Take the case of a child who has everything done for them, or is simply forced to follow a chain of strict rules; when a child's life is habitual, formulaic, or completely controlled by outside influences, the conscious decision making part of their brain doesn't achieve its full potential. Similarly, in adults, if we stop utilizing the prefrontal cortex for a significant period it weakens and our decision-making ability is compromised. The way various regions of our brains react is comparable to muscles. If they don't get exercise they shrink and become flaccid, and if they do get exercise they grow and develop, increasing strength, speed, and dexterity.

Basically, every area of our body that experiences increased activity reacts by demanding increased nourishment, whether in more blood flow to carry food and oxygen, or heightened nerve pathways to provide electrical energy and chemical catalysts... and the body responds to this increase by enhancing the active nourishment pathways. Muscle development is the easiest of these systems to observe but structural changes occurring within the brain, although on a smaller scale, are no less dramatic - especially when you understand the variable range of potential growth in children between birth and physical maturity. The prefrontal cortex matures very slowly, and relies

heavily on learning, with up to 50% of actual, physical, brain development a direct result of learning. In the face of such a fluid degree of potential an incredibly heavy burden of responsibility is placed on the teaching skills of both parents and educators to stimulate this growth. The depth of knowledge and commitment brought to bear at this stage may determine a child's ultimate achievements and quality of life.

Your brain is an entire versatile system made up of many interrelated but functionally specific sectors, similar to the 600 plus muscles in your body and, like muscles, each area thrives on use, responds positively to training, and may suffer damage if overdeveloped in one area and underdeveloped in others. However, unlike muscles, changes in the brain are largely invisible and damage may show up in ways that, until recently, weren't attributed to poor training. New insights into brain development are emphasizing how important the methods used for teaching children are on childhood brain development.

Our bodies are controlled by electricity. Muscles contract or relax due to minute electrical charges sent from the brain through the nerve tissues, and this makes everything happen, both conscious, like deciding which cereal to buy at the store, and unconscious, like breathing, pumping blood and digesting food. And our brains, being the focus for electrical energy, are where electrical circuitry has its greatest concentration. It has been said that brain cells differ from other cells in that they don't regenerate so when you lose them they are gone forever but that isn't entirely true or entirely the issue. The brain develops and changes through its limited ability to grow new cells but more importantly by its ability to build and enhance the electrical pathways between existing cells.

Neurologically speaking, the speed and facility for growth inherent in brain neurons and synaptic pathways is beyond what was imagined just a few years ago... and that forms the basis of its "plasticity". It is the brain's ability to continuously create and restructure this complex, multi-layered, web of pathways that makes it substantially different from the rest of the body. Brain cells shrink and go dormant while others revive and grow, all based on the changing patterns of use, and the subsequent growth of synaptic pathways between cells. The brain is constantly undergoing a process of adaption in response to the never-ending stimuli it receives and, both our conscious and unconscious choices, generate structural change in support of whichever regions of our brain are most in demand. New electrical pathways are constructed and enhanced to facilitate changes in use, while other parts, not in use, are reduced in size and complexity... perhaps to make way for growth in more active areas. The space for brain development is, after all, limited by its hard protective shell, and for those who believe the old myth about people only using 10% of their brains, its utter nonsense and displays how truly ignorant of brain mechanics most of us are.

The new concepts in brain development might best be illustrated by examining learned behavior and one of the most powerful examples of a learned behavior is addiction. Everyone knows an addict of one kind or another with drugs and alcohol being the most recognized culprits, and if you are dependent on some form of either, or any other addictive substance or activity for that matter, research is showing that your brain is in the process of shutting down the prefrontal cortex and shifting more activity to a region in the unconscious or habitual part of itself... the dopamine receptor area.

Dopamine is a narcotic we manufacture within our bodies. It has a variety of uses from masking pain caused by injuries, thus allowing us to maintain basic survival functions, to creating the pleasure of an orgasm as a reward for procreation, and regularly accessing this region, over time, causes active control of your decision making ability to shift away from the conscious rational area of your brain, to the unconscious "reward" or "feel good" part of your brain. Consequently, succumbing to an addiction of any kind such as tobacco, drugs, alcohol, food, gambling, shopping, or whatever, is achieved through suppressing that rational choice decision making part of your brain, the prefrontal cortex.

Addictive substances or activities aren't rational choices; they are destructive choices, but in choosing these activities you stimulate the feel good sensors in your brain and get a momentary sensation of wellbeing. In other words, in an effort to feel good your unconscious overrides the sensible decision making part of your brain and seeks access to the dopamine receptors. Continuous activity in this region of your brain, and suppression of the rational decision making region, eventually reduces your ability to be sensible and increases your need to follow habitual activities even if they are blatantly destructive. Because your brain constructs more and better pathways throughout the areas of greatest activity the longer you persist in this activity the more difficult it will be, first of all, to recognize the need for change and, secondly, to bring about that change, because it will require a greater degree of physical and structural change inside the brain itself.

One particularly interesting discovery coming from this research showed up when scientists tested the theory that soft drugs lead to hard drugs and they found a strong correlation, but not the one most people think. It's not marijuana that gets more people hooked on cocaine or heroine... its cigarettes. People who start smoking before their brains have fully developed are being unconsciously conditioned by their tobacco addiction to be more susceptible to further addictive substances and activities.

As you might expect, once researchers became aware of these brain realities they quickly began promoting the need to focus greater attention on rational choice decision making in early childhood, and their research expanded to the question: What enhances growth in the rational choice area of the brain, as opposed to the immediate feel good area of the brain? The answer is not as straight forward as some may believe, for a number of reasons, including: the relatively recent increase in the scope of addiction, its concentration in wealthier nations, and the discovery that combating the problem conflicts with culturally defined child rearing attitudes.

In evolutionary theory if you habitually make poor decisions you disappear without a trace (no DNA left behind), but in present day wealthy nations we protect young people, in particular, and adults to a lesser extent, from their bad decisions. Families and close communities ameliorate the destructive decisions of an individual in an attempt to promote change within that person. In days long past (my youth), addiction was not a large problem because few people had money to invest in that kind of behavior. It wasn't that we were substantially better decision makers; we simply had fewer options but, now that children have greater wealth and more choices, the latest research tells us they must be specifically trained to avoid addictive behaviors, or else they fail to build enough structure in the rational decision making part of their brains.

It sounds absolutely basic and obvious, but it's not, because our culture has decided that childhood is a separate "state of being" and different rules apply. We have been taught to accept that it's okay for children to indulge in a series of feel good activities because we believe that childhood is a special time and they will grow out of their bad habits as they reach maturity. The fact is they don't; at least not easily, and if they do it will be as a result of a long painful process, often at high cost to the rest of society.

To be fair, it must also be emphasized that adults with a history of making destructive choices are not write-offs. Everyone is capable of changing their brain at any age; it just takes longer and more effort when existing physical structures previously developed in the brain have to be altered. Addicts can kick their addictions. With a level of desperation bordering on self-preservation and, ideally, strong support from people who care, a process of change can begin to regenerate that part of their brain which has been suppressed. It is a process that requires time and enormous dedication, and the concept that it takes every waking moment, one day at a time, and involves acknowledgement of the problem, and confession of past transgressions, is exactly the right message because there has to be that conscious, repetitive, ongoing, acceptance and confession in order to reestablish the self-monitoring and moral decision making aspect of our prefrontal cortex. It can only come from deep within the individual. Other people can't make those decisions for you and bring about the required changes.

A child's brain, on the other hand, is still in that highly "plastic" stage. If they are trained to make rational, non-destructive decisions early in life it will be more difficult for them to make destructive choices later as that region of their brain making the decisions will already have established a dominant position... and it is about training not just instruction. If you tell a child something is wrong and they agree with you it doesn't mean they are developing their decision-making ability. They must be put in positions where "they" decide, and reap the consequences, hopefully while still responsive to the judgment and influence of wiser parents and teachers. You can't simply teach them by telling them over and over. Formulaic activities take you in the exact opposite direction. You might as well get them to write hundreds of lines on a blackboard saying "I will never take drugs," or "I will not smoke."

Children must be put in a position where they are encouraged to make rational decisions and discouraged from making feel good destructive decisions. When you give them lunch money will they buy the pop and chips or a bottle of water and a banana - now you begin to see how difficult this is - will they go for good nutrition or a sugar high? When they earn money will they impulsively rush out and spend it or will they keep it until something important is needed? These are the kinds of choices that channel brain development as it relates to, or away from, rational choice decision-making. If you are constantly making the immediate "high" inducing decisions at an early age than you are developing the unconscious dopamine receptor area of your brain and suppressing the prefrontal cortex, and the research is telling us that the earlier in life you begin the addictive process the harder it is to change.

Later in life, even when you consciously know change is necessary your unconscious brain will keep making destructive choices for you. Drugs and alcohol may be the famous examples but any activity that fires our dopamine receptors can lead to addictive behaviors. How many times have we all heard a smoker say "I know it's wrong and it hurts me but I just can't quit," or the obese person who tells you they know its killing them but they can't stop overeating, or the habitual spenders who've maxed out their credit cards but can't stop buying unnecessary items. We are raising whole generations of these people. Obviously, the best time to take control is when the brain is still developing and it's the responsibility of parents, especially, and society in general to recognize and respond to this learning curve with consistency and, dare I say it, discipline. Good luck with explaining that to a kid screaming for candy.