BE SMART

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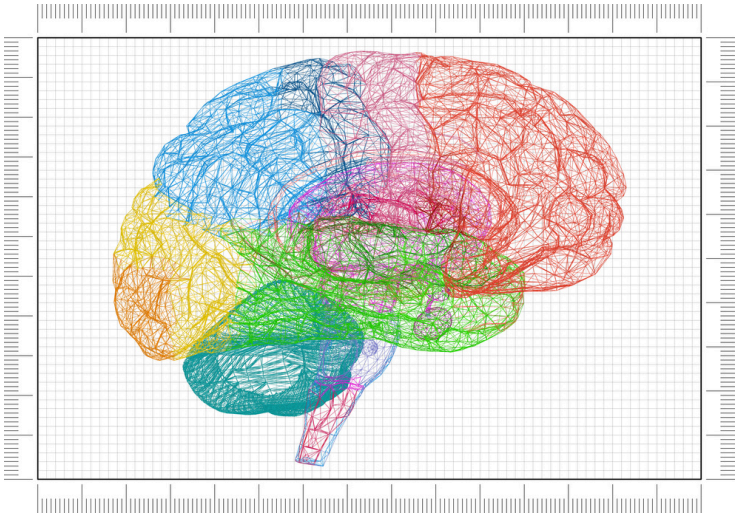
THE NEUROSCIENCE BLUEPRINT: GUIDING THE SMART FAMILIES MISSION

We all want what's best for our children. The #1 predictor of future success is not socioeconomic status or IQ, but the development of higher level executive functioning skills which are developed in the prefrontal cortex between 12-25 years old. These skills include organization, empathy, and self-control. We will show you how your brain develops naturally and how smartphones and certain online applications can permanently harm your child's ability to develop these skills.

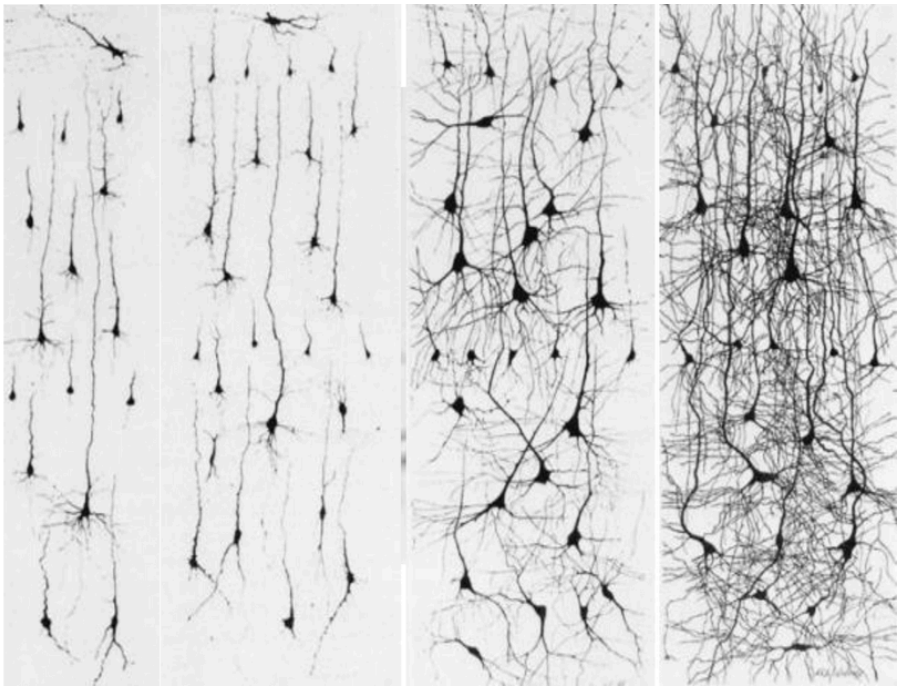


"The human transition from child to adult depends in part on getting the right kinds of experiences at the right time to guide the rapid rewiring of the adolescent brain."
-Jonathan Haidt, The Anxious Generation

EARLY BRAIN DEVELOPMENT

At birth, the average baby's brain is about a quarter of the size of the average adult brain. The average brain keeps growing and is 90% fully developed by age five. These early years are also the time when new connections are made between brain cells far more than any other time in life - at a rate of over one million new neural connections (synapses) every second. By age three, neurons get wired to other neurons, forming about 100 trillion connections. Each connection is an opportunity to learn.

SMART FAMILIES



Birth 1 month 6 months 24 months

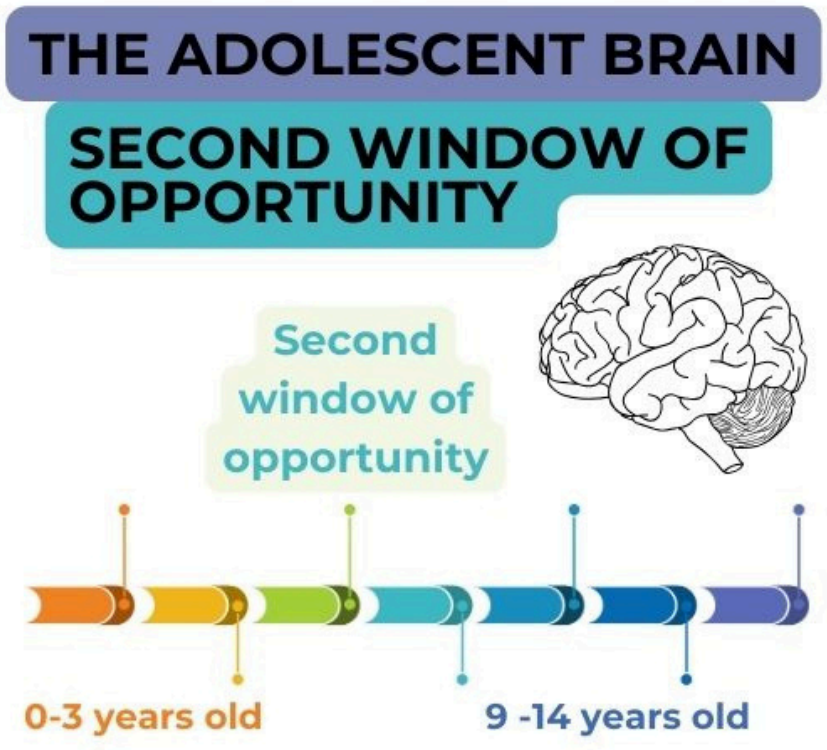
Billions of new neural connections happen every second.

The brain undergoes pruning, where some connections are strengthened and some are weakened.

The amount and quality of care and stimulation a child receives during this time determines which connections develop and last a lifetime.

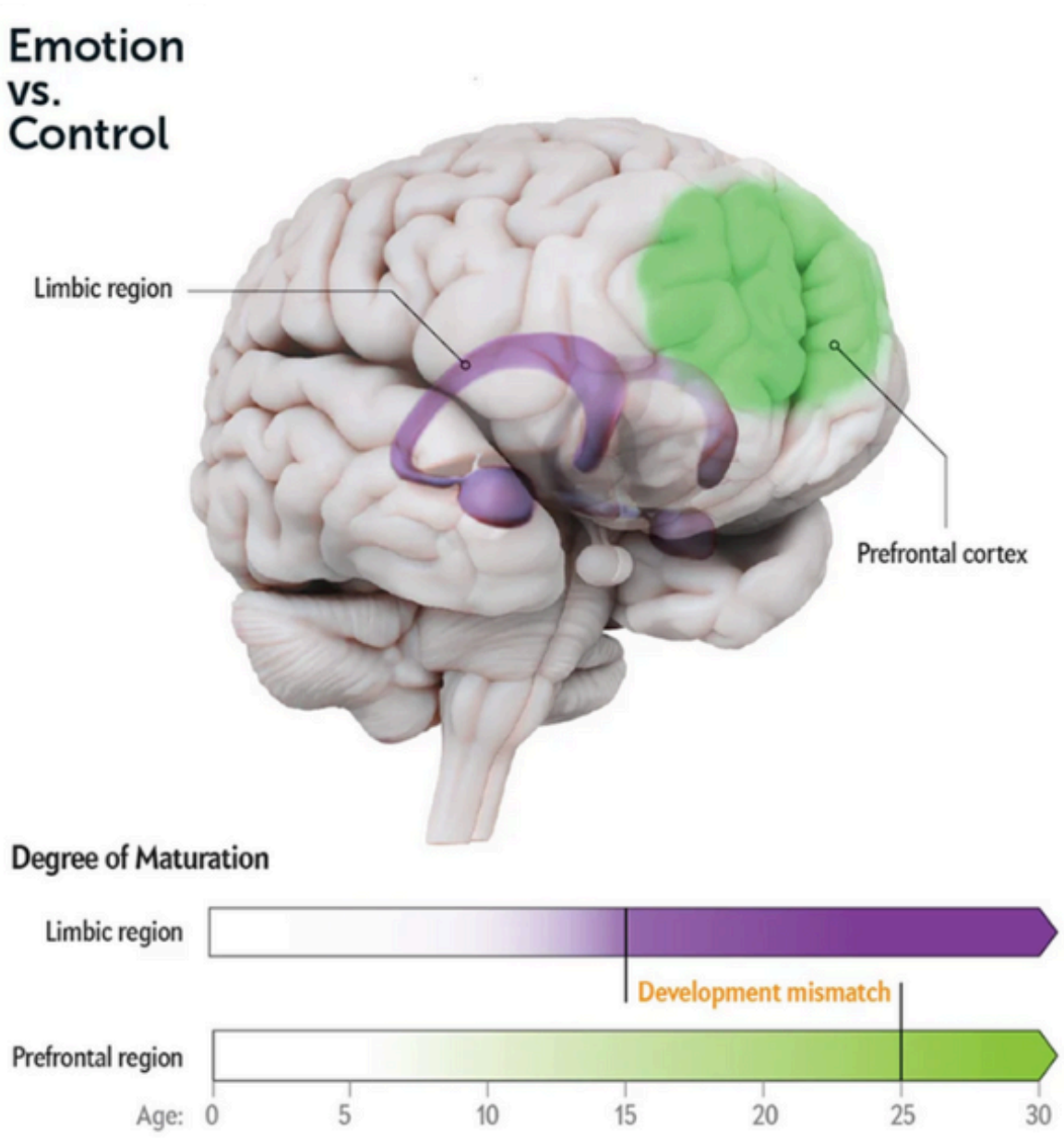
SECOND WINDOW OF OPPORTUNITY

Adolescence (approx. age 9-14) is a crucial time for developing the social skills and brain functions needed for adulthood. During this phase, children's brains undergo significant transformation. While early childhood is known for rapid neural growth, adolescence offers a second chance to positively shape brain development. By providing the right environment, we can help children reach their full potential.



DEVELOPMENTAL MISMATCH

The adolescent brain works differently than the adult brain when it makes decisions or solves problems. Studies indicate that there is a mismatch between the maturation of networks in the limbic system ("accelerator pedal"), which drives emotions and becomes turbo-boosted in puberty, and the maturation of networks in the prefrontal cortex ("brake pedal"), which occurs later and promotes sound judgment and the control of impulses. **This mismatch explains why so many adolescents engage in risky behavior.** We now know that the prefrontal cortex continues to develop through a person's early 20s until it matures around age 25.



USE IT OR LOSE IT

During adolescence, the brain undergoes a significant transition called synaptic pruning. The neurons and connections an adolescent does not use are pruned away and disappear forever. The neurons that are used more frequently grow stronger and faster. In fact, these neurons build insulated myelin sheaths to turn these neural connections into superhighways. This is why neuroscientists call this adolescent period the "USE IT OR LOSE IT" stage of development.

You see the problem here...it's at this stage that your child's brain decides if it will USE OR LOSE certain higher level executive functioning skills by making connections to the prefrontal cortex.

What connections are being reinforced inside your child's brain?

http://www.eng.yale.edu/synapses.htm

EXECUTIVE FUNCTIONING SKILLS

Executive Function is a set of cognitive processes and mental skills that help an individual plan, monitor, and successfully execute their goals. The executive functions, as they're known, include attentional control, working memory, inhibition, and problem-solving, many of which are thought to originate in the brain's prefrontal cortex.

Children are not born with these skills– they are born with the potential to develop them.

The prefrontal cortex, the part of the brain which houses executive functions, is still maturing well into our teens and twenties. So, teaching executive functioning skills should start early, be reinforced regularly, and continue through high school. As the prefrontal cortex develops through life experiences, executive functioning skills are acquired and sharpened.

Problematic digital media use, such as internet addiction and smartphone overuse, inhibit an individual's ability to develop basic executive functioning skills. For example, technology overuse is contributing to decreased sensitivity to emotional cues. This means that children are losing the ability to understand the emotions of other people.

Executive functioning skills are the most reliable predictor of success and long-term happiness in life. They are more predictive than test scores, IQ, or socioeconomic status, according to several studies reviewed by the team at Edutopia.

DOPAMINE: WHAT IS IT? HOW DOES IT IMPACT ADOLESCENT BRAINS?

Dopamine is a naturally occurring chemical produced by our brains that plays a starring role in motivating behavior, memory, and reward and is located primarily in the limbic system ("accelerator pedal"). Dopamine plays a crucial role in the adolescent brain, shaping how teens develop, behave, and think. During adolescence, the dopamine system undergoes notable changes, making teens more sensitive to rewards and novel experiences, often driving risk-taking behaviors and the pursuit of new activities. Dopamine also influences social behavior, pushing teens to seek social rewards and peer approval, which shapes their social development and identity. Additionally, dopamine impacts the development of the prefrontal cortex, which is responsible for decision-making and impulse control, often leading to a mismatch between heightened reward sensitivity and still-maturing impulse control. Technology developers use their understanding of dopamine's effects on the adolescent brain to design features that exploit and manipulate dopamine levels, keeping adolescents engaged and coming back for more.

CONCLUSION: THE IMPACT OF SMARTPHONES ON ADOLESCENTS

Because adolescent brains are more sensitive to dopamine than the adult brain, they are even more susceptible to mindless scrolling and the addictive pull of certain websites, video games, or the immediate feedback of social media "likes." As a reminder, dopamine is released in the limbic portion of the brain, a portion that is fully developed much sooner than its counterpart, the prefrontal cortex. Without stimulating and rewarding the prefrontal cortex, there can be permanent harmful effects to higher level thinking.

Smartphones allow this continual dopamine dump to happen more often today than to our human ancestors. The brain responds by turning down the number of dopamine receptors. Now ordinary life can no longer stimulate the same neurochemical response and we see more adolescents suffering from anxiety or depression.

Smartphones are always available and always around. This means adolescents are constantly tempted to tune out the "real world" and tune in to whatever game, text chain, or social media application incites the most dopamine. It also means that teens and kids are spending less time in face-to-face conversations, missing out on valuable lessons in building social-emotional and executive function skills.

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