BE SMART

MONTHLY NEWSLETTER
OCTOBER 2024
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LEVEL UP: THE SCIENCE OF ADDICTION AND ITS IMPACT ON GAMING

Remember when ‘one more game’ meant five more minutes? Now, it seems like five more hours is the case with gaming. There's a reason these video games are so hard for your child to put down, and it all points back to what’s unfolding in your child’s brain as they are playing these addictive games.

No parent wants their child to be uncontrollably addicted to a substance or device.

In this month's newsletter, we are breaking down the science behind gaming addiction and why it’s more important than ever to understand how gaming can affect your child’s brain. Many of the tactics used in gaming are also used in social media (particularly short form videos) so effects can be the same.

From Johann Hari in Stolen Focus:

“The opposite of addiction is not sobriety. It is human connection.”

INSIDE THE ADDICTED BRAIN: WHAT YOU NEED TO KNOW

Addiction is not just a lack of willpower or a series of poor choices; it's a chronic disease that affects the brain's reward, motivation, and memory functions and it creates powerful cravings for substances or behaviors that provide temporary pleasure but long-term harm.

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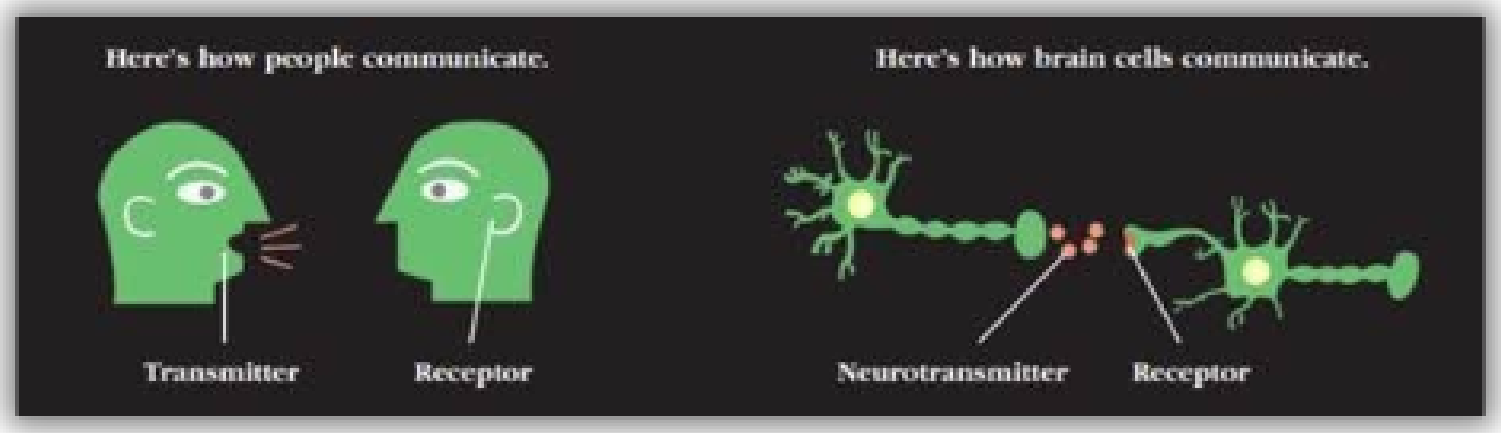
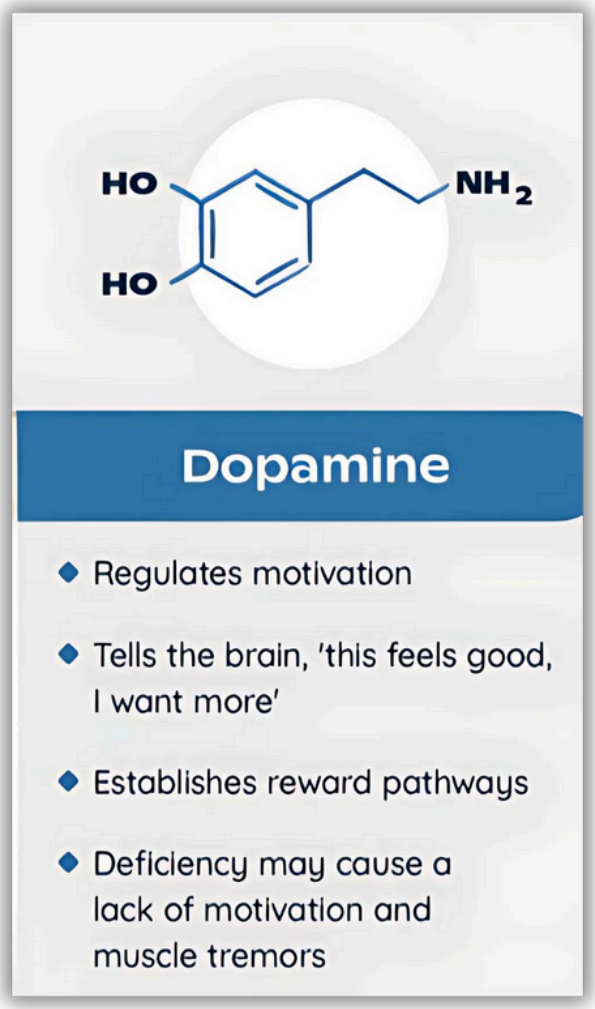
The brain consists of billions of cells (neurons) that communicate by sending chemical signals (neurotransmitters) across small gaps (synapses) within the network. These signals prompt responses in other neurons, allowing the brain to process and send information.



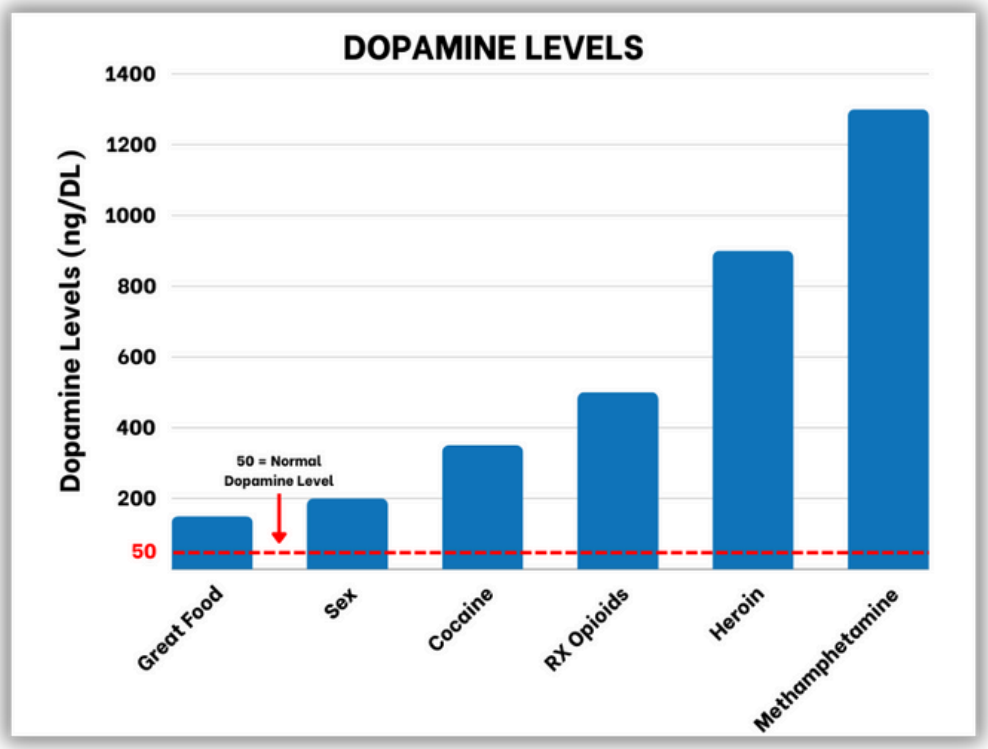
Drugs, drinking and other addictive behaviors, like gambling or gaming, change the way brain cells communicate with each other.



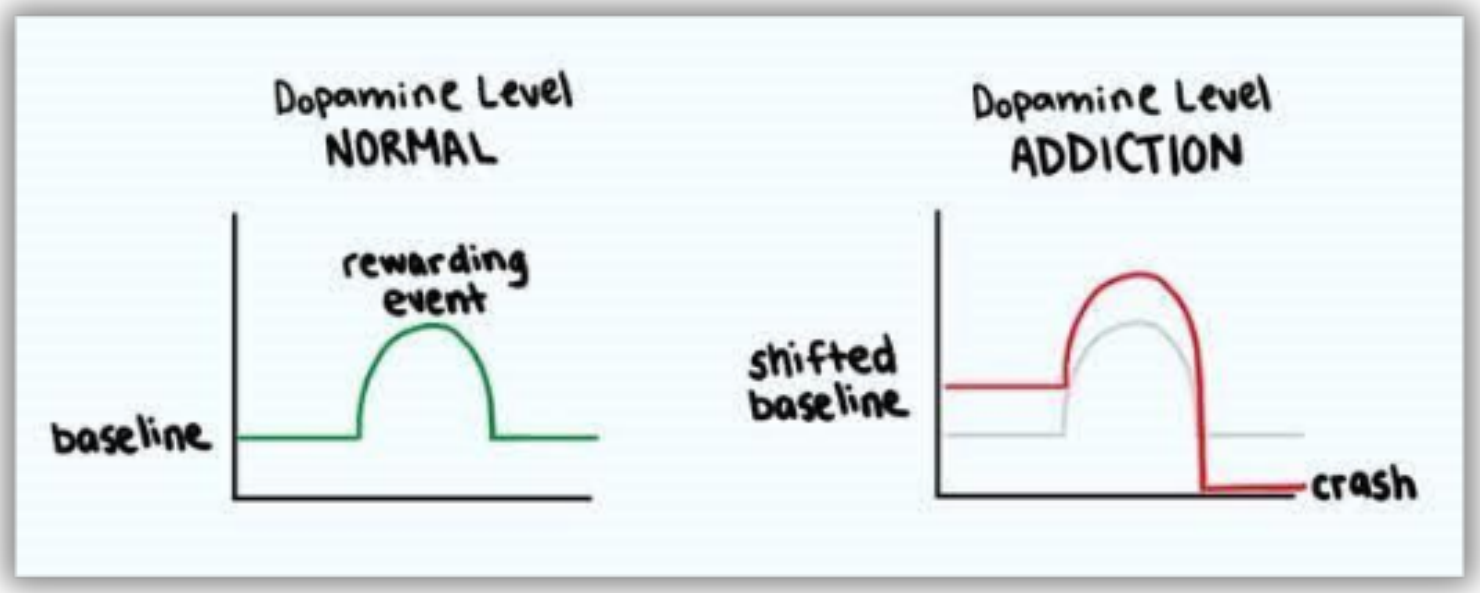
DOPAMINE AND THE BRAIN: THE CYCLE OF REWARD AND ADDICTION

Our brains are wired to ensure that we will repeat life-sustaining activities by associating those activities with pleasure or reward. Whenever the reward circuit is activated by a healthy, pleasurable experience, the neurotransmitter, dopamine, signals that this important event needs to be remembered. This signal causes changes in neural connectivity, making the activity easier to repeat and form habits.

An average brain typically produces around 50 nanograms of dopamine per deciliter per day—100 on an exceptionally good day. Levels spike during natural activities like eating (3x) or sex (4x) and skyrocket when substances like tobacco (8x), marijuana (12x), heroin (18x), and methamphetamine (22x) are introduced.



If repeatedly overstimulated, the brain reduces the number of receptors available to receive dopamine to protect itself. This leads to tolerance, where it's harder for other natural stimulus to produce enough dopamine to make you reach the same high as before. This is one way addiction and cravings get worse over time and ordinary life becomes uninteresting.



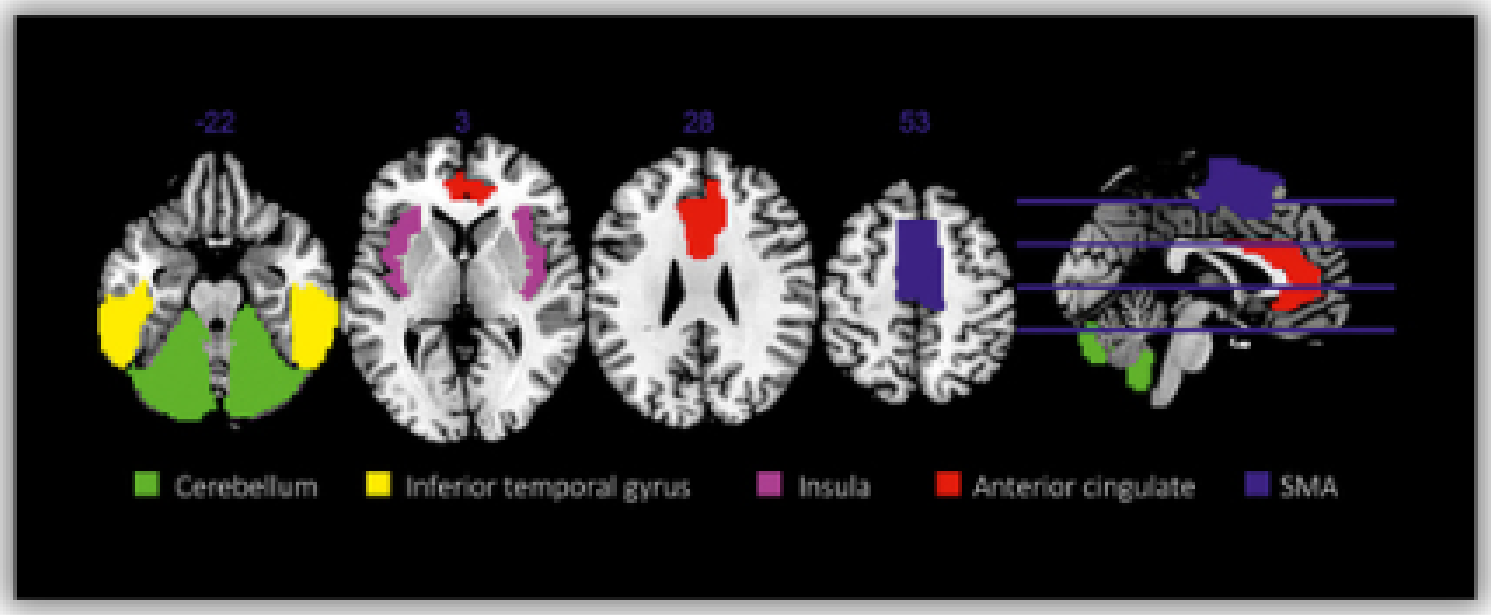
GAMING: A NEW GENERATION OF CHALLENGES

Many modern addictions are not classified as disorders by the American Psychiatric Association, not because they aren't addictive, but because they aren't considered debilitating in our modern world. Of course, this is a matter of perspective, and if you considered staring at an inanimate box instead of engaging in traditional human activities debilitating, then nearly all of us would be considered smartphone, email, or social media addicts. However, gaming has become such a problem that the World Health Organization included "gaming disorder" in its International Classification of Diseases in 2018.

Back in 1998, gaming was already shown to double dopamine levels. Modern-day online games are designed to be even more engaging and rewarding, using advanced technology, complex reward systems, and social interaction to maximize player retention and enjoyment. These brain-stimulating elements contribute to higher and more consistent dopamine release compared to the simpler, less interactive games of the 1990s.

Brain-activation studies show that video games can affect the brain similarly to drugs, impacting reward processing, executive function, sensory information, and self-reflection, even after just 20 minutes of play. Furthermore, regular gaming is linked to impulsivity, impaired cognitive control, and reduced prefrontal cortex function.

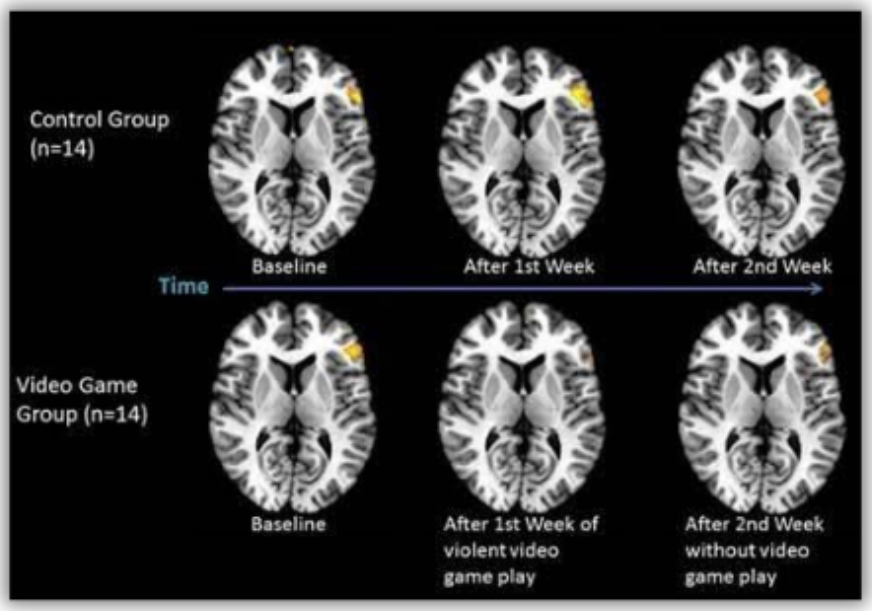
Studies show long-term changes in gray matter that affect memory, attention, impulse control, emotional regulation, and motor function in those with gaming disorder. Gray matter, referring to the areas of the brain with large concentrations of neurons, houses the most cognitive and emotional functions essential for all aspects of human behavior.



Regions that showed reduced gray-matter volume in internet gaming disorder (IGD).

MRI scans show that after a week of playing a violent video game, young men showed less activation in the prefrontal cortex, suggesting a desensitization to violence.

Credit: Indiana University School of Medicine



HOW MUCH IS TOO MUCH?

We're often asked, how much gaming is too much? Everyone's dopamine tolerance is different, so responses to gaming vary. However, today's games are engineered to maximize dopamine release, with business models that encourage extended play time through in-game purchases and advertising, even though these games are marketed for free or low cost. We encourage parents to treat gaming like any other substance that's been engineered to be addictive.

Scan the QR Code to listen to one of our favorite podcasts on gaming.

Screenstrong is one of our favorite podcasts on how technology impacts our brains and health. The founder, Melanie Hempe, got inspired when her son failed out of college because of a gaming addiction.

RESOURCES:

Source: 1
Mambo.io. How Gamification in Apps Impacts Brain Performance. Retrieved from: https://mambo.io/gamification-guide/how-gamification-in-apps-impacts-brain-performance

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ScienceDaily. (2013, January 10). New Evidence on How Violent Video Games Can Affect the Brain. Retrieved from: https://www.sciencedaily.com/releases/2013/01/130110094415.htm

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Image Source: Passkit. (2020, May 26). A Reflection on ADHD and Video Game Addiction Risk. Retrieved from: https://www.mypasskit.com/blog/2020/5/26/a-reflection-on-adhd-and-video-game-addiction-risk

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Image Source: EurekAlert. (2020, September 28). Excessive Gaming Linked to Risky Behavior in Teens. Retrieved from: https://www.eurekalert.org/news-releases/794671

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World Health Organization. (2018, September 14). Inclusion of Gaming Disorder in ICD-11. Retrieved from: https://www.who.int/news/item/14-09-2018-inclusion-of-gaming-disorder-in-icd-11#:~:text=Gaming%20disorder%2C%20with%20its%20online%20and%20offline%20variants%2C,in%20personal%2C%20family%2C%20social%2C%20educational%20or%20occupational%20functioning