

# Is Social Media Scientifically Impacting the Brain of Users

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## Abstract

In recent years, social media has gained immense popularity among younger generations due to its ability to facilitate social interactions. However, the use of social media has been found to have negative effects on the brain, primarily through the release of dopamine, commonly referred to as the "feel-good" chemical. Dopamine is a neurotransmitter that plays a crucial role in sending signals to nerve cells and influencing the experience of pleasure. When individuals engage with social media, it activates the brain's dopamine reward pathway, creating a loop that reinforces the desire for more engagement. This chemical alteration of the brain can lead to changes in the dopamine threshold, resulting in overuse or addiction to social media. This article aims to explore the impact of social media on the brains of countless users, particularly the excessive release of dopamine. Firstly, we will examine how social media triggers an addictive response in the brain by stimulating the reward system and perpetuating the dopamine loop, often without the users' conscious awareness. Secondly, we will delve into the ways in which social media affects mental health, including the replacement of genuine happiness and its impact on concentration and focus. Lastly, we will discuss strategies to mitigate the harmful effects of social media and propose preventive measures.

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## 1 Science behind the addiction to social media

Similar to alcohol and drugs, social media has a detrimental impact on the brain. When users engage with social media platforms, it triggers the release of dopamine, which follows the brain's reward pathways. This dopamine release induces feelings of pleasure and satisfaction. However, users often unknowingly enter a cycle where the brain adjusts its dopamine threshold to maintain the same level of enjoyment as before. This phenomenon, known as the social media "dopamine cycle," occurs when the brain associates the use of technology with pleasurable experiences and craves it during times of discomfort. As users increase their social media usage, the brain's reward threshold also increases, leading to a greater need for more social media stimulation to achieve the same level of pleasure that was previously attained with less exposure. This escalating cycle perpetuates a craving for social media and contributes to addictive behaviors. Following the use of social media, the brain undergoes a compensatory mechanism in which it reduces dopamine levels below the initial baseline. This phenomenon gives rise to what is known as the "Dopamine Loop." Users experience a sense of dopamine depletion, prompting them to seek further stimulation on social media in order to elevate dopamine levels and regain satisfaction. Unfortunately, these efforts prove to be inefficient, as each subsequent interaction with social media results in even lower dopamine levels than before. Consequently, users inadvertently establish a recurring dopamine cycle that gradually alters the dopamine threshold, ultimately leading to addiction.

## 2 Impacts of Social Media in Mental Health

Social media has deteriorated mental health among teens. Prior to using social media, users are in a state of homeostasis. However, the release of high doses of dopamine during social media interactions disrupts this balance, causing the brain to compensate by pushing dopamine levels below the baseline. This creates a state of "dopamine deficit" where users experience a sense of unhappiness as dopamine falls below its normal levels. This deficit state can manifest as anxiety or depression and serves as a foundation for various mental health disorders. During this phase, individuals attempt to restore dopamine levels, often by increasing their time spent on social media. Unfortunately,

this perpetuates a cycle where users become reliant on social media to alleviate the dopamine deficit and seek temporary relief from their negative emotional state. Consequently, the excessive use of social media further exacerbates mental health issues among teenagers. The excessive use of social media can create an illusion of happiness, but it fails to replicate the authentic experience of true happiness. The release of substantial amounts of dopamine during social media interactions can mimic the sensation of happiness. However, due to the dopamine loop, users often find themselves feeling even worse after using social media as their dopamine levels dip below the baseline. This negative impact is reflected in the mental health of modern-day teenagers, with studies showing that those who spend more than two hours on screens are more likely to rate their mental well-being as poor or bad (McNamara).

In contrast, genuine happiness can be understood through the Japanese concept of "Ikigai," which defines the value and purpose that each individual finds in life, a unique and personal experience for everyone. While social media may simulate happiness, it paradoxically has an adverse effect on the brain of users. It leaves individuals feeling dissatisfied and compelled to seek further dopamine stimulation to compensate for the dopamine loss, perpetuating a cycle of fleeting "happiness" and intensified episodes of "unhappiness." Moreover, social media has the tendency to replace genuine happiness, or Ikigai, thereby contributing to poor mental health outcomes.

### **3 Effects of Social Media on Concentration**

The use of social media has various impacts on the brain's ability to focus and concentrate. Firstly, the addictive nature of social media triggers brain activity through the stimulating effects of sounds and light. Teenagers often engage with their phones at night, leading to reduced sleep duration and even insomnia. The lack of adequate sleep diminishes focus and impairs nerve activity. Secondly, social media can unconsciously hinder concentration. A study involving children revealed that those who had their smartphones within sight, even if they were not actively using them, performed worse on cognitive tests compared to those who kept their phones out of reach in another room (Ehmke). This study demonstrates the detrimental effects of smartphones on the brains of students,

as the constant presence of the device unconsciously affects focus by keeping the brain in a state of continuous alertness to potential stimuli, such as notifications. Moreover, many students believe they can effectively "multitask" by engaging in multiple activities simultaneously, such as watching videos while doing homework. However, research has consistently shown that true multitasking is not possible, as the brain continuously shifts focus between the various tasks, preventing full concentration on any one activity.

## **4 How the Impact and risks of Social Media can be Reduced**

The younger generations face a growing risk of diminishing intellectual capacity due to the detrimental effects of social media and technological devices on concentration, as well as the associated mental health concerns. To address this issue, experts strongly advise implementing several strategies. First and foremost, it is recommended to limit daily screen time to less than two hours in order to mitigate the negative impact on cognitive abilities. Additionally, when striving to concentrate on tasks, keeping the device out of reach can significantly enhance focus by minimizing distractions. Another effective approach is to disable all notifications, as this helps prevent the brain from constantly anticipating dopamine stimuli. Furthermore, experts suggest periodically disconnecting from smartphones and other devices to foster connections with the non-technological world. Taking breaks from technology allows individuals to engage in activities that promote intellectual growth and well-being, such as reading, pursuing hobbies, or spending quality time with loved ones.

## **5 Conclusion**

The impact of social media on mental health and concentration is evident through its influence on dopamine release and the brain's reward pathways. Social media creates a loop that compensates for the surge of dopamine by reducing the threshold below the original levels, leading to feelings of sadness.

This dopamine loop can significantly impact mental health, as the resulting "dopamine deficit" can resemble symptoms of anxiety and depression. Concentration is also affected by social media, both consciously and unconsciously. The constant exposure to social media platforms and the allure of notifications can disrupt focus and hinder one's ability to concentrate on tasks. To mitigate these effects, experts recommend unplugging from technological devices periodically. By intentionally disconnecting, individuals can prevent the formation of a generation that is negatively impacted by the mental health concerns associated with excessive social media use, as well as combat decreased intellectual ability and concentration.

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