

## The Effects of Social Media on Teens

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### Introduction

Social media usage has changed the way humans share information, communicate, and consume media. Social media refers to online technologies that facilitate the sharing of ideas, thoughts and information through virtual networks and communities. Whether used to overcome boredom or gain social acceptance, social media has become especially prevalent within the lives of adolescents. Today's teens have several ways to go online, connect with others, and find information. Most teens have or have access to a smartphone (95%), a desktop or laptop computer (90%), gaming console (83%), or tablet (65%) (Anderson et al., 2023). YouTube continues to dominate as a social media platform. Roughly nine-in-ten teens say they use YouTube, making it one of the most widely used platforms by teens (Anderson et al., 2023).

TikTok, Snapchat and Instagram are also popular among teens: the majority of teens ages 13 to 17 say they use TikTok (63%), Snapchat (60%) and Instagram (59%). For older teens ages 15 to 17, these percentages increase to about 70% (Anderson et al., 2023). Teens are less likely to use Facebook and Twitter (recently renamed X) than they were a decade ago: Facebook once dominated the social media landscape among America's youth, but the share of teens who use the site has dropped from 71% in 2014-2015 to 33% today (Anderson et al., 2023). Nearly half of teens say they use the internet "almost constantly." Overall, around nine-in-ten say they use the internet at least daily (Anderson et al., 2023).

Many studies have explored correlations between social media and its impacts on adolescents. The dangers of social media for preteens (9–12) and young teenagers (13–15) include risks regarding personal safety, identity theft, privacy concerns, access to disturbing and inappropriate material, social isolation, and an increase in mental health concerns such as depression, anxiety, and poor sleep (Dyer, 2018). On the other hand, social media can provide children with positive interactions, stronger friendships, improve access to diversity, increase inclusion, and reduce social isolation (Dyer, 2018). They can also benefit by increasing their communication skills with friends and relatives and developing their socialization processes (Tartari, 2015). Teenagers are able to use social media to obtain information about topics like health, education, and to increase their technical skills using the latest technologies (Tartari, 2015). The mixed findings of past review papers suggest that there is no definite answer to the impacts of social media. Presented as a crucial aspect of adolescents' life, social media and its effects should be explored in order to provide more solid conclusions. The purpose of this paper is to delve into the impacts of social media on adolescents and its implications for the future.

### Social Impacts

Social media allows teens today to more easily connect with their peers and communicate with a broader range of people. Positive interactions with others on social media can lead to the development of social skills and strengthen connections with others. Although social media may strengthen these teen relationships it may also reveal a sense of loneliness as negative feelings and comparisons can develop. Increased exposure to social media can also

lead to exposing teens to cyberbullying due to the anonymity of social media platforms. In the following section the topics of cyberbullying, friendship and loneliness will be addressed in regards to how they have been affected by social media.

## Cyberbullying

“Cyberbullying is defined as “an aggressive, intentional act or behavior carried out by a group or an individual, using electronic forms of contact, repeatedly and over time, against a recipient who is unable to easily defend him/herself” (pg. 376, Stanbrook, 2014). Cyberbullying provides individuals with the means to extend face-to-face bullying to an online environment where actions can have instant, widespread, and permanent effects (Stanbrook, 2014). Features of social media also allow for greater opportunities for cyberbullying. These features make actions more visible and personal information accessible through an individual's profile. With the way cyberbullying occurs there is also the possibility for the abuse to be spread by others and to continue online. Making this abuse more widespread can be done by using tags and hashtags on social media (Chan et al., 2021). These features create a significant difference from traditional in person bullying and other cyberbullying types such as email, telephone or messaging (Chan et al., 2021). Bullies online remain more anonymous in comparison to in-person bullying and children often feel as if they are free of consequences due to the difficulty in tracing internet activity (Notar et al., 2013). They also have increased self-confidence as they do not see the victim face to face (Notar et al., 2013). Past generations were not faced with the judgment of peers as soon as they arrived home. However, social media has created avenues for the bullying to continue outside of the classroom. Social media has almost no boundaries, and students today only have their own knowledge to protect them from teasing, harassment, and threats that can reach them online (Notar et al., 2013). This raises the idea that the occurrence of cyberbullying is greater than traditional bullying (Stanbrook, 2014). Cyberbullying is considered a developing problem related to social media use and has become a significant public health concern that can lead to mental and behavioural health difficulties as well as an increased risk of suicide (Garret et al., 2016). Most analyses of cyberbullying overlook the role of social media in promoting cyberbullying and how it increases its prevalence in the lives of adolescents (Chan et al., 2021). Research suggests that the impact of cyberbullying on teenagers can be severe and can impact a teen's social well-being. There is a significant correlation between becoming a cyber victim and loneliness among adolescents and victims of cyberbullying tend to be more reliant on the internet, feel less popular, and take more internet related risks (Notar et al., 2013). They are also more often a bystander or perpetrator of internet and mobile phone bullying, and are more often a victim of traditional bullying (Notar et al., 2013).

## Friendships

Close friendships are characterized by supportiveness, accessibility, and responsiveness, and fulfill adolescents' need for intimacy (Pouwels et al., 2021). Historically adolescents have engaged in peer relationships in person, but since the emergence of social media, adolescents have begun to communicate with their friends virtually to stay connected (Pouwels et al., 2021). Friendship closeness in adolescence is an important factor in successful psychosocial development later in life. Due to the prevalence of social media in the lives of adolescents,

studies have started to examine how the development of friendship closeness is altered through social media usage (Pouwels et al., 2021). Some studies have investigated how friendship closeness is impacted by social media. The following research paper examines whether Facebook interaction through “likes”, “tags” and the number of “friends” influences the teenager’s self-esteem (Botou & Marsellos, 2018). According to their research it appeared that self-esteem was not correlated with the frequency the users use Facebook or their level of acceptance or popularity (Botou & Marsellos, 2018). Research has also reinforced the view that the use of social networks has become an important and daily part of teenagers’ lives (Botou & Marsellos, 2018). Teenagers appear to participate in social media mainly in order to establish or maintain relationships with close friends, peers and the opposite sex, rather than being exposed to strangers (Botou & Marsellos, 2018). In addition to this, interpersonal relationships and contacts have not been limited due to social networks (Botou & Marsellos, 2018). It is highlighted that the acceptance of their appearance is correlated with the number of friends, evidence showing that the higher number of Facebook friends makes them feel better for their appearance (Botou & Marsellos, 2018). This may be a reason for why more than half of the participating teenagers “tag”, in order to increase their friends (Botou & Marsellos, 2018). Interactions with friends are the building blocks for friendship closeness, and due to social media adolescents may experience only momentary friendship closeness. Adolescents use social media to share different aspects of their lives, and so friendship closeness could be achieved over a small time interval. This short-term friendship closeness may cause long term developmental change in adolescents, affecting both well-being and social interactions. Therefore, it is important to understand to what extent these momentary fluctuations are induced by adolescents’ social media use.

## Loneliness

Loneliness is frequently characterized in terms of one's connection to others, or more specifically as "the unpleasant experience that occurs when a person's network of social relations is deficient in some important way" (pg. 31, Sun, 2008). It is not yet clearly shown how our connection through digital media has impacted loneliness and there are many mixed findings regarding the link between social media and loneliness (Sun, 2008). A study shows social media platforms such as Snapchat and Instagram determined that their users experienced less loneliness (Sun, 2008). Another significant finding was that the use of these platforms predicted an increase in happiness (Sun, 2008). These findings suggest that the ability to induce a positive state is due to the fact that images are associated with the presence of another individual rather than communicating to just an object (Sun, 2008). This suggests that a photo of a friend going about their day or a video of them speaking is more likely to signal to the brain that they are actually present (Sun, 2008). In person conversations occur in real time, so immediate response is important for social presence (Sun, 2008). Due to the speed of technology people are able to gain immediacy, but lack intimacy that is normally acquired through in person conversation (Sun, 2008). With more friendship centered platforms developed, this study deduced that there is hardly any relationship between text-based social media use and psychological well-being, although they found that happiness can increase when using these platforms (Sun, 2008). On the opposing side, another study concluded that feelings of loneliness were a result of those that had a higher prevalence of problematic social media

usage. This emphasizes the need for more comprehensive research on social medias' impact on mental well-being.

## **Behavioral and Cognitive Impacts**

Cognitive development is a change in mental abilities such as learning, memory, reasoning, thinking, and language (Zhuri, 2023). According to Piaget, a teenager is motivated to understand the world because of his biological adaptive behavior (Zuhri 2023). During this period adolescents are able to distinguish things or ideas that are more important than others, and then they develop those ideas as well (Zuhri, 2023). A teenager can not only organize what is experienced and observed, but also can process their way of thinking to come up with a new idea (Zuhri, 2023). The development of adolescent thinking provides the capacity for new cognitive and social opportunities (Zuhri, 2023). Thinking becomes increasingly abstract, logical and idealistic (Zuhri, 2023). They become better able to examine their own thoughts, what others think and what others think of them, and better able to interpret and monitor the social world (Zuhri, 2023). Along with the developmental changes adolescents are also influenced by the development of information technology, as many of their daily activities always involve activities related to technology (Zuhri, 2023). Technological developments need to be taken into account when exploring cognitive and behavioral development in teens because technology can have both positive and negative effects on the behavior of its users (Zuhri, 2023).

There is no definite understanding of what problematic behavior on social media means or how it should be measured, and there are wide variations in defining the current level of problematic use of social media (Paakkari et al., 2021). With the consistent use of social media being normalized it can be difficult to determine when the behavior becomes problematic (Paakkari et al., 2021). Some reviews have characterized problematic social media using components that apply to addictions, while others have used criteria based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (Paakkari et al., 2021). These have also been applied to internet gaming disorder, with possibilities for defining social media disorder more generally (Paakkari, et al., 2021). Higher monitoring of social media usage by parents was associated with lower prevalence of problematic social media use. Low academic achievement, irritability, nervousness, and feelings of loneliness were mental health symptoms of users who had higher prevalence of problematic social media use (Paakkari, et al., 2021). Problematic users were also more likely to suffer from neck and shoulder pain and headaches, as well as morning tiredness and short sleep (Paakkari, et al.,2021). No risk-users experienced the fewest health complaints or negative health indicators (Paakkari, et al.,2021).

The presence of peers is not the only component that influences teen behavior. Increasing evidence has shown that an individual's extended social network can exert complex and often indirect effects on their behavior (Cerniglia et al., 2017). A study of adolescents and young adults mapped the friendships of teens in grades 7 through to 12 at three different time points (Cerniglia et al., 2017). Analyses of these data have found that the strength and structure of both direct and indirect social ties can exert a potent influence on teen lifestyle behaviors such as smoking, alcohol and substance use, school performance, sleep patterns, criminal delinquency, and sexual activity (Cerniglia et.al 2017). A consistent finding across studies suggests that the behavior of friends and of friends of friends can significantly promote the

adoption of risky behaviors throughout adolescence (Cerniglia et al., 2017). These behaviors can be detrimental to mental health. An example of this was shown in a study that examined the links between sleep and drug use. It was found that each drug-using friend increases a teen's own chance of taking drugs by up to 42% (Cerniglia et al., 2017). Social media has the ability to increase a teenager's exposure to behaviors such as alcohol and substance use, violence and sexualized content, and normalize these behaviors amongst online peers (Lamblin et al., 2017). The ability to share, view, and rate such content with peers provides adolescents with social validation that acts as a powerful influence. With this in mind, adolescents are more likely to endorse risky content if it has previously received more 'likes' from peers (Lamblin et al., 2017).

## Neurobiological Impacts

Understanding the effects of social media on the brain requires a dive into the realms of neuroscience and behavioral psychology. Neuroscience helps us understand the intricate processes and stages of brain development from prenatal stages through adulthood. It provides insights into how neural networks form, how different brain regions interact, and how the brain adapts and changes in response to environmental factors, such as social media. Because the findings are mixed regarding social media's impact on teens, it is helpful to consider the underlying neurobiological impacts, as this shapes adolescents' mood and behavior. Neuroscience allows us to understand how social media is impacting the brains of adolescents. It also provides insight into the long term effects of social media and its implications for future generations.

Neurobiological studies have revealed changes occur in the brain during the second decade of life. Contrary to belief that the brain is almost fully developed by the end of childhood, adolescence is a time of significant brain growth and change. In fact, the brain of an early adolescent in comparison to that of a late adolescent differs measurably in anatomy, biochemistry, and physiology (Weinberger et al., 2015). Between childhood and adulthood, the brain's "wiring diagram" becomes richer, more complex, and more efficient (Larsen & Beatriz, 2018; Weinberger et al., 2015). This is emphasized in the brain's frontal lobe. An important part of the frontal lobe is the prefrontal cortex (PFC), which is responsible for skills such as setting priorities, organizing plans and ideas, forming strategies, controlling impulses, and allocating attention (Weinberger et al., 2015). Research suggests that the PFC is one of the last areas of the brain to fully mature (Weinberger et al., 2015). The brain produces a large number of neural connections just before puberty connections that diminish in number throughout adolescence. Through this process, the brain becomes leaner and more efficient (Weinberger et al., 2015). Neuroimaging studies have demonstrated that association cortices, including areas like prefrontal cortex (PFC), posterior parietal cortex, and superior temporal cortex that are thought to support higher order cognition, continue to undergo structural and functional maturation during adolescence, including gross morphology, connectivity, and task-induced activation (Larsen & Beatriz, 2018). Core cognitive functions like working memory and inhibitory control are available even in early development and rapidly improve throughout childhood (Larsen & Beatriz, 2018). The transition from adolescent to adult cognition is a process of increasing the reliability of successful cognitive processes and reducing behavioral variability, leading to consistent and optimal responses (Larsen & Beatriz, 2018). In addition to this, cells that use dopamine increase one's capacity to learn in response to reward and increase the

density of their connections with the prefrontal cortex (Weinberger et al., 2015). Dopamine inputs to the prefrontal cortex grow dramatically during adolescence, most likely representing one of the neuronal mechanisms that increase the capacity for more mature judgment and impulse control (Weinberger, et al., 2015). Beginning in adolescence, the dopamine reward signal becomes especially important in the prefrontal cortex as ideas become reinforced and valued (Weinberge et al., 2015). Large amounts of scientific research on the neurological development of teens confirms that teenagers are not the same as adults in a variety of key areas. These areas include the ability to make sound judgments when confronted by complex situations, the capacity to control impulses, and the ability to plan effectively. Normative adolescent behavior is characterized by a peak in sensation seeking that is believed to adaptively motivate experience that supports individuality during the transition to adult roles and responsibilities, but also creates susceptibility to risk-taking (Larsen & Beatriz, 2018). This occurs during the continued refinement of higher-order cognitive abilities (Larsen & Beatriz, 2018). Such limitations reflect the areas of the adolescent brain, especially the prefrontal cortex, which are not fully mature until the third decade of life. (Weinberger et al., 2015). These differences are important to consider when understanding the impact that social media has on adolescents, as the brain is undergoing major changes and development. It has also been hypothesized that shorter-term peer influences are not related to increased peer exposure as a whole, but instead processes where adolescents' are in regards to developmental stages (Guyer et al., 2016). These include limited self-reliance, reduced ability to act independently, or decision-making that is easily influenced by emotional and social factors (Guyer et al., 2016). It has also been proposed that adolescents place high value on peer rewards, causing sensitizing incentive-processing brain regions to respond to the potential rewards of risk taking (Guyer et al., 2016). This also induces social brain processing regions to react strongly to social events such as peer evaluation or exclusion (Guyer et al., 2016). Social media has broadened the scope of peer influence, so that teens are now constantly exposed to their peers. This influences the decisions of adolescents more heavily due to the regular usage of social media.

## Reward

Adolescence is a period with heightened sensitivity to social rewards compared to non-social (Deng et al., 2021). This makes adolescents more sensitive to both positive and negative social stimuli and rewards (Deng et al., 2021). The emotional expressions of others are also more significant to adolescents because they are symbols of social approval which are particularly rewarding. Neuroimaging studies show that when receiving social approval, teens show more activation in parts of the brain involved in rewarding stimuli, such as the ventral striatum, medial prefrontal cortex, and orbitofrontal cortex compared to adults (Deng et al., 2021).

A study found that adolescents perceive information online differently. This plays a role in social media usage, as adolescents believe that online information is valued more highly by peers (Sherman et al., 2016). Their analysis suggests that an important hub of the brain's reward circuitry is implicated in the experience of receiving positive feedback on one's own images as well as viewing other people's images that have been endorsed by peers (Sherman et al., 2016). The response of this system in the brain, like our behavioral effects, was evident for participants' own photos, suggesting that self-presentation can be especially rewarding and a

motivation for using social networks (Sherman et al., 2016). Prior studies have shown that compared to other age groups, adolescents are vulnerable to addictive behavior because of the way they experience rewards (Deng et al., 2021). Research has suggested that problematic smartphone usage is influenced by adolescent reward sensitivity, suggesting that the adolescent's brain's reward system plays a role in smartphone activities such as social media (Deng et al., 2021). A study used functional MRI to stimulate Instagram and measure adolescents' behavioral and neural responses to "likes", a source of potential peer influence (Sherman et al., 2016). Adolescents were more likely to like photos with many likes compared to those with few likes. Even images that depicted risk behaviors such as drinking and smoking (Sherman et al., 2016). Viewing photos with many likes was associated with greater activity in neural regions involved in reward processing, social cognition, imitation and attention (Sherman et al., 2016). When adolescents viewed risky photos the activation in cognitive-control networks decreased (Sherman et al., 2016). These findings emphasize social media and peer influence during adolescence (Sherman et al., 2016). Receiving "likes" on social media is also associated with increased activation in the dorsal and ventral striatum, which is implicated in reward processing (Deng et al., 2021). The level of ventral striatum is related to the amount of social media use (Deng et al., 2021). The difference in the highly activated reward system and the prematurely developed control systems may lead to more impulsive smartphone usage (Deng et al., 2021). This may suggest that the high reward sensitivity of adolescents could be leading to problematic smartphone usage (Deng et al., 2021).

## Conclusion and Future Directions

Social media is a relatively new development in human history and it is continuing to change over time. Due to its relative newness, we still do not have a clear understanding of its long term impact on adolescents. Existing research has found that social media can impact teens at the social, behavioral, cognitive, and neurobiological level, however, some studies point to positive benefits for teens, while others suggest increased mental health problems, risk-taking behaviors, and bullying. In the future, more research should be done in finding the more definite impacts of social media based on usage. Research should consider different degrees of social media usage and how the different components of social media contribute to emotional and behavioral responses. Longitudinal studies should be done to follow people across time to explore how social media usage, particularly throughout childhood and adolescence, can have long term impacts in adulthood. Additionally, research has been done with small sample sizes--future work should include larger and more diverse samples of individuals. More research also needs to be done on the adolescent brain, as the changes that occur in the adolescent mind and how that affects behavior, mood, and emotionality are not fully understood. In order to fully understand whether social media is ultimately beneficial or harmful an understanding of how social media use impacts normative behavior and development is crucial for future progress. Social media has become embedded in our society and will continue to play a role in communication. It is essential that research explores its impacts, especially on those still undergoing critical physical and mental development.

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