Centre for International Governance Innovation

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Policy Brief No. 9 — February 2024

Freedom of Thought, Social Media and the Teen Brain

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Key Points

- Social media offers spaces where young people can socialize, learn and play, but these digitally mediated environments also challenge the right to freedom of thought, as surveillance capitalism and attention economics push content harmful to young people's mental health.
- Brain development during adolescence leaves young people particularly susceptible to social pressure, peer opinion and social comparison. Frequent and excessive social media use has been associated with changes in brain physiology.
- Policy solutions to protect freedom of thought should not focus on outright technological bans but on measures to restrict exploitive platform design features and on investment in media literacy education to empower teens, parents and teachers to use social media in ways that foster health and well-being.

Introduction

Currently, there are more than five billion active social media users worldwide (Petrosyan 2024) who are spending an average of 144 minutes per day using platforms such as Instagram, Snapchat, Facebook, TikTok and YouTube (Dixon 2024). Social media is popular, particularly with adolescents, who use it to chat, send images, share stories and keep up with friends, family and acquaintances (Anderson, Faverio and Gottfried 2023; Vogels and Gelles-Watnick 2023). For many young people, social media is the preferred way of communicating with one another, replacing face-to-face interactions (Rideout and Robb 2018). Given social media's status with teens, researchers are paying increased attention to understanding how social media use affects adolescent development, in particular, their mental health and well-being (for example, Twenge et al. 2018).

Recently, there has been a wave of high-profile media investigations into the relation between social media platforms and mental health, which have documented some potential harms for young people. Headlines such as "The Dangerous Experiment on Teen Girls" in *The Atlantic* (Haidt 2021), "American Teens are Really Miserable. Why?" in *The New York Times* (Douthat 2023) and "Facebook Knows Instagram Is Toxic for Teen Girls, Company Documents Show" in *The Wall Street Journal* (Wells, Horwitz and Seetharaman 2021) have raised alarm bells over social media's impact on teen depression, anxiety and eating disorders. These concerns have grown significantly alongside increasing screen time during

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the COVID-19 pandemic, which rose by 52 percent in children and adolescents worldwide (Madigan et al. 2022). Associations between social media use and increases in depression and anxiety symptoms were also reported during the pandemic (Lee et al. 2022).

There have always been concerns over the effects of technology on the well-being of young people, from the introduction of radio and television to today's debates over social media. But researchers are revisiting many of these questions because of the scale, reach and influence of platforms on our everyday lives. Built on the business model of "surveillance capitalism," platforms collect immense amounts of data about users to sell personalized advertisements (Zuboff 2019). Relying on "attention economics" to keep users online longer, algorithms feed users content they might engage with (Wu 2016; Williams 2018). However, sometimes the content people engage with is not always the best for their mental health and well-being. With young people coming online earlier and staying online longer (Šuica, Breton and Russell 2022), concerns over platform business practices have drawn renewed attention to the toxic effects platforms might have on the developing teenage brain and the psychological adjustment of teens.

When it comes to examining the rights of young people online, discussions have largely focused on the right to privacy and freedom of expression. But the increased impact of social media on the way we think, feel and behave provides a new opportunity to evaluate challenges around teen mental health and well-being on digital platforms through the lens of freedom of thought. Freedom of thought is protected under the Universal Declaration of Human Rights[1] and the International Covenant on Civil and Political Rights,[2] both of which guarantee freedom of thought as part of religious liberties, and the ability to hold opinions without interference as part of freedom of expression. Under international law, freedom of thought is considered part of one's *forum internum* — or the inner space of one's mind where one's "mental faculties are developed, exercised and defined" (United Nations General Assembly 2021, para. 2). Freedom of thought is also considered an

1 *Universal Declaration of Human Rights*, GA Res 217A (III), UNGAOR, 3rd Sess, Supp No 13, UN Doc A/810 (1948) 71, s 18, online: <www.ohchr.org/en/resources/educators/human-rights-education-training/universal-declaration-human-rights-1948>.

2 *International Covenant on Civil and Political Rights*, 19 December 1966, 999 UNTS 171 (entered into force 23 March 1976), online: <www.ohchr.org/en/professionalinterest/pages/ccpr.aspx>.

absolute right that cannot be restricted for any reason, making it distinct from other closely related rights, such as freedom of expression, which can be limited by states for reasons such as the protection of public safety or the rights of others, among other reasons.

In 2021, the UN Committee on the Rights of the Child "urged State parties to identify, define and prohibit digital practices that 'manipulate or interfere with' children's freedom of thought, including 'automated systems or information filtering systems' that can 'affect or influence children's behaviours or emotions'" (ibid., para. 38). The focus of this policy brief is, first, on how social media — and the design and governance of these platforms — may affect children's right to freedom of thought, and second, on the digital practices or policies that might interfere with this right when we think about freedom of thought through the lens of adolescent development and well-being.

It is important to recognize that protecting children's right to freedom of thought does not mean designing technology to influence young audiences in a certain kind of way. Nor does it mean calling for a ban on these technologies all together. Despite its definite portrayal in the media, research on the impact of social media on child and adolescent mental health and well-being is not straightforward. Some of the best evidence about the relationship between social media and teen well-being — derived from meta-analyses, which combine results from studies and quantify associations — shows that although there is a link between social media use and poorer mental health (for example, Ivie et al. 2020; Shannon et al. 2022), the associations tend to be small (Orben and Przybylski 2019). However, with billions of users, even a small effect on mental health should not be viewed as trivial (Vaillancourt et al. 2023). Moreover, although the effects are on average small, there are clear groups of users who are much more vulnerable than others. For example, Meta's internal research[3] showed that adolescent girls were particularly sensitive to the negative effects of social media, driven in large part by social comparisons on Instagram (Wells, Horwitz and Seetharaman 2021).

Freedom of thought provides us with a framework to not only look at the problem differently, but also to think about how we might better design digital platforms to support the unique needs of young people.

Freedom of Thought: The Case of TikTok Tics

TikTok is one of the most popular social media applications for adolescents (Anderson, Faverio and Gottfried 2023; Vogels and Gelles-Watnick 2023). During the pandemic, videos about tic disorders went viral, generating millions of views on the platform. Positive representations of tics and those living with movement disorders such as Tourette syndrome can help normalize a traditionally stigmatized condition that affects approximately 1.5 million Canadians (Zandbergen 2021). Nevertheless, at the height of the pandemic, clinicians in Australia, Canada, the United Kingdom and the United States were seeing a growing number of patients, not just for COVID-19, but for "tics" (Stokel-Walker 2021). Tics are characterized by "sudden twitches, movements, or sounds" that occur repeatedly and are beyond the control of the affected person (American Psychiatric Association 2022). The increase in tics during the pandemic was curious, but so was the atypical presentation of these well-defined disorders. During the pandemic, tics were more severe and self-injurious, and involved more coprolalia (non-intentional and often socially inappropriate vocalizations), than is typically seen (Olvera et al. 2021; Radhakrishnan et al. 2022). This presentation differed from the more characteristic tic behaviour, such as eye blinking, nose twitching or throat clearing. Another oddity about tic disorders during the pandemic was the number of *teenage girls* affected. Tic disorders are more common in boys than girls and peak in severity between the ages of 10 and 12 (American Psychiatric Association 2022). Besides noting these unusual features, clinicians discovered that their patients had one other thing in common: TikTok (Jargon 2021). These distinct features suggested that TikTok might be acting as an incubator of psychopathology via social contagion (for example, Haltigan, Pringsheim and Rajkumar 2023). If TikTok can have this much influence on the prevalence and presentation of complex mental disorders, what does this mean for the right to freedom of thought? That is, can

3 Meta has since refuted *The Wall Street Journal*'s reporting. See Raychoudhury (2021).

the nature of some social media platforms unduly influence the inner space of the adolescent mind?

The Right Not to Have Our Thoughts Manipulated

Scholarship and jurisprudence on freedom of thought have highlighted several important pillars that support this absolute right and can help us think through how our right to freedom of thought might be affected by digital technologies. One important pillar is the right to not have our thoughts and opinions manipulated (Alegre 2021). In legal scholarship, manipulation is defined as "interference with the processes of understanding" to form "biased mental models and social representations such as knowledge and ideologies" (van Dijk 2006, 1). Defining what manipulation looks like in practice, however, is complex, because our thoughts are continuously influenced by our environment and those around us. Young people are shaped by many factors, and technology is just one small part of this influence.

Another important consideration is at what point influence becomes manipulation. In a report on freedom of thought, the United Nations Special Rapporteur on freedom of religion or belief discussed several factors that can help draw distinctions between influence and manipulation, such as *consent*, which considers whether consent was free and informed; *concealment or obfuscation*, which considers whether a reasonable person would be aware of the intended influence; *asymmetrical power*, namely, whether there is a power imbalance between the influencer and the rights holder; and *the occurrence of harm*, in either intent or effect (United Nations General Assembly 2021, para. 36).

Thinking back to the example about TikTok tics, we might consider the way TikTok's design, features and policies might manipulate freedom of thought by exposing users to certain kinds of information or content. Like all social media platforms, TikTok's algorithm uses data about users and their behaviour to programmatically determine their interests and push similar content for consumption. If a user is exposed to problematic content, spending time watching these videos can cause the algorithm to continue to promote these types of videos. Although tic videos are not problematic in and of themselves, the algorithmic promotion of this content toward vulnerable users does not include any information about how or why these videos are being promoted, nor does it include information labels so that users could understand this disorder. And the consumption of these videos by vulnerable audiences has led to harm, where young girls began presenting more severe and self-injurious tics than are typical of the disorder (Jargon 2021).

Beyond tics on TikTok, there have been other documented harms of algorithmically promoted content for teen mental health and well-being. When it comes to eating disorders, even if the content of a site focusing on food and nutrition is not explicitly pro-anorexia, for example (that is, promoting behaviour related to an eating disorder), it may reflect weight-normative perspectives or biases that may then be pushed by algorithms to vulnerable users, which can contribute to eating disorders and body dissatisfaction among young people (Minadeo and Pope 2022). This is worrisome because researchers have demonstrated that for many young people, viewing this type of media increases social comparisons of physical appearance, which are especially harmful to individuals with eating disorders (Pedalino and Camerini 2022; Pruccoli et al. 2022). On the flip side, experimental research has shown that *reducing* social media use helps improve self-esteem regarding their appearance and weight in adolescents who are emotionally distressed (Thai et al. 2023).

Another way we might think about how social media can interfere with how we think and feel about ourselves is through research on image filters and body image disorders. Filters, lenses and other editing tools on social media apps such as Snapchat that are used to enhance appearance, for example, by whitening teeth, creating plumper lips, and removing blemishes and wrinkles, are also proving to be particularly problematic for adolescents' body image disturbances. These retouching features are likely one reason that Snapchat is so popular with adolescents: close to 20 percent of Snapchat's 548 million consumers are aged 13 to 17 (Dixon 2023). These popular editing tools have been shown to change how teens view their bodies. For example, the viewing of edited images has been linked to body image

disorders (Ramphul and Mejias 2018) and an increased desire for and acceptance of cosmetic surgery (Maes and de Lenne 2022; Chen 2019).

Overall, it is important to emphasize that social media's association with mental health problems is not straightforward or causally linked. Nevertheless, when considering the vulnerability of adolescents to these types of algorithmic priming, we need to consider their unique susceptibilities. In particular, unlike the adult brain, the adolescent brain is not fully developed, and thus is more susceptible to manipulation.

Modification of Thought: Teenage Development and Social Media

Psychological manipulation of how we think, and how we feel, can also be examined in the context of "modification of thought," which is defined as the changing of one's thoughts via a direct alteration of brain chemistry or brain functioning (van Dijk 2006). Although modification of thought has generally focused on deep-brain stimulation to modulate brain activity, or the consumption of psychoactive substances that can alter or modify one's brain chemistry (United Nations General Assembly 2021, paras. 32–34), this concept might also be interesting for exploring questions at the intersection of freedom of thought and teenage brain development. Here, the question becomes: If social media usage can change the structure and chemistry of the brain, particularly when youth are in a vulnerable stage of development, what does this mean for their right to freedom of thought?

Adolescence is a period when risk-taking behaviour peaks, when well-being experiences the greatest fluctuation, and when mental health challenges such as depression or anxiety emerge (Fuhrmann, Knoll and Blakemore 2015; McGrath et al. 2023). Adolescence is also a time when identity and a sense of self-worth develop. Of note, these developmental changes occur when the brain is not fully developed and is therefore susceptible to social pressures, peer opinions and social comparison (Blakemore and Mills 2014). Indeed, one of the most important things that sets adolescents apart from adults is their underdeveloped brains.

Most people know that the prefrontal cortex, the area of the brain responsible for regulating thoughts, actions and emotions (Arnsten 2009), is not fully developed until around age 25, although recent evidence suggests this may occur sooner (Tervo-Clemmens et al. 2023). But the story of the teenage brain is not just about the prefrontal cortex. For example, the nucleus accumbens, the area of the brain that directs motivation to seek rewards (Salgado and Kaplitt 2015), is also developing during adolescence (Casey, Getz and Galvan 2008). The implication of these developmental differences is that adolescents need high excitement and low effort to get them engaged, both of which are afforded by the structure of social media.

Neuroscience research on the relation between social media use and brain development is still in the early stages, but there are studies showing how frequent social media use is associated with distinct changes in the brain, which can increase adolescents' sensitivity to social rewards and punishments (for example, Maza et al. 2023). There is also research showing that the brains of frequent social media users resemble the brains of those with substance abuse or gambling addictions (He, Turel and Bechara 2017; Montag et al. 2017). An important caveat to these studies is that it is not social media use per se that is correlated with changes in brain physiology; rather, it is the *frequent* and even *excessive* use of these digital platforms that seems to be the issue. The picture of how, under what conditions, and if social media changes the teenage brain or causes mental health problems is not unequivocal. Young people will be differentially affected based on their gender and age, genetics (Ayorech et al. 2023), and the amount of time they spend on platforms (Orben et al. 2022), as well as by individual variations in temperament and environment. Still, emerging research in this area suggests the need to closely monitor if and how social media affects brain development during adolescence and if teens are more vulnerable than adults to having their thoughts and opinions manipulated because of the peculiarities of their brain development.

Recommendations

The popularity of social media platforms among young users make them an integral part of their lives that is worthy of attention. Concerns over the possible negative effects of heavy social media use on the health and well-being of young people have prompted a series of government responses. In the United States, platform regulation for child safety and well-being is one of the few issues that receives bipartisan support. Some laws focus on limiting the addictive properties of platforms — such as California's Age-Appropriate Design Code, an assembly bill passed in 2022 that places restrictions on design features that increase or sustain user attention, such as auto-playing videos or rewards for time spent online.[4] Conversely, some law makers, such as those in Montana, have placed an outright ban on TikTok, due to both its real and perceived harms to children's mental health (Archie 2023). One of the challenges with regulating this issue is that law makers must strike a balance between safety and harm, and some laws might limit many of the benefits that young people get from using social media. Young users, school districts and even governments (for example, British Columbia; see Panchadar [2024]) are also starting to sue (or considering suing) technology companies, claiming that they exposed youth to harmful products with few safeguards such as strong age verifications and parental control features (Crawford and Smith 2023).

When thinking about harm and young people and their rights online, three recommendations emerge as priorities.

The first relates to the need for better data about the effects that platform use can have and is having on young people. To address this, platforms should cooperate with researchers and policy makers to develop scientific councils to better study the effects of platform usage on mental health and brain development. One of the biggest challenges researchers face when trying to work with platforms is data privacy, and children and adolescents are particularly vulnerable groups who need special protections. But scientific councils that adhere to academic best practices for data collection and use could be important for generating new and important research about the effects of social media use on adolescent mental health, while ensuring that the privacy of young users is protected.

The second recommendation is that child protection legislation must move beyond banning applications or content altogether and should instead focus on the systemic problems that make these technologies addictive in the first place. Since research on the negative effects of social media highlights frequent and excessive usage as an underlying driver, we need to design and implement legislation that places restrictions on features that encourage and even reward screen time. It is important to remember that social media can have positive effects on the lives of teenagers, and overly punitive or restrictive laws could limit these benefits. But the attention economics and business models of social media platforms can also undermine these positive effects. Moving design away from addiction can help teens — and, indeed, all of society — live healthier online lives.

Finally, we know that young people experience social media differently depending on demographic factors, temperament, biology and environment. Thus, laws and regulations that take a one-size-fits-all approach to protecting the mental health and well-being of young people might, on the one hand, exclude certain vulnerable groups from protection and, on the other, simultaneously, over-regulate other users. Responses to the mental health challenges posed by social media should not only be centred around laws, which can be restrictive, limited in focus and not specific enough to deal with the unique needs of all young people. Rather, policy makers should also look to invest in educational programs for teens, parents and educators so that users can be empowered to use social media in ways that place their health and well-being at the centre of use — rather than as something to be exploited by companies. Examples include initiatives by non-profit organizations such as MediaSmarts (Canada) and Social Media Literacy (European Union), which have evidence-based digital media literacy programs designed to promote responsible social media use and critical thinking in a digital world.

4 US, AB, 2273, *The California Age-Appropriate Design Code Act*, 2021–2022, Reg Session, Cal, 2022, online: <https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB2273>.

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This policy brief was made possible thanks to the financial support of the Konrad-Adenauer-Stiftung (KAS) Canada.

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