Annotated Bibliography
Research on Social Media and Child and Adolescent Wellbeing

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Access to Full Articles

We have provided direct links to the included resources. However, most of the articles in this bibliography are from peer-reviewed research journals and news sites that require a subscription. Due to copyright restrictions, we are unable to include access to the full original articles as part of this report. The individual legislators serving on the Joint Standing Committee on Education and Cultural Affairs will be provided with direct access to electronic copies of each resource. All other readers wishing to access a full article may do so by contacting the Law and Legislative Reference Library (https://legislature.maine.gov/lawlibrary/) and requesting the specific article(s) of interest. Alternatively, most journal articles can be purchased from the publisher for a one-time fee.

Introduction

This document was prepared as part of the Maine Education Policy Research Institute's (MEPRI's) annual contracted work for the Maine Legislature's Education and Cultural Affairs committee. We intend for this annotated bibliography, which surveys the current literature on the intersection of social media and child and adolescent mental health, executive functioning, and wellbeing, to be of use to legislators as they consider the role of legislation or other policy solutions in prioritizing the safety and healthy development of Maine's youth.

We ask readers to note the continually evolving understanding of the impacts of technology on users, particularly social media and, increasingly, artificial intelligence (AI). Unfortunately the rate of technological development and implementation far outpaces academic research. Furthermore, even the most current research is limited in its ability to investigate the impacts of social media use on still-developing youth. For these reasons, we approached this review of research with conservative expectations: we don't know what we don't know — yet.

We found that the literature is starting to converge in the most recent years, and appears to be moving towards consensus in some key areas. In the early 2010's, when social media was in its infancy, published research often offered conflicting conclusions as to the benefits or harms of social media. However, ongoing research has found more consistently negative effects in recent studies, especially when accounting for user age of first social-media use and user gender, and even early defenders of social media now concede that it is causing harms to users[1]. As the research continues to mature, it will further clarify questions such as the difference between social media use versus technology use; include more accurate time-use surveys; and feature studies that rely on empirical data rather than self-reported data.

This annotated bibliography attempts to connect readers with the most salient current resources to gain a holistic understanding of what is known about social media use that intersects with adolescent mental health and executive function. Mental health and executive function exist alongside–and are inter-related with the physical, psychological, social, and cultural realities of individual adolescents. We thus expanded our scope beyond the given task to ground readers' understanding in the fuller context of social media's cultural and social influences. This allows the reader to have a broad understanding of the bio-psycho-socio-cultural effects of social media use on adolescents.

After an introduction to what states are currently doing to address social media's influence on children and adolescents, we situate the research within eight topic areas. Each topic area section features a brief overview followed by a synopsis of each piece of literature included for that topic area. Finally, to augment the academic literature provided and offer readers a window into what is currently being discussed in news and popular media on this topic, we have included curated references to newspapers, news websites, books, and other sources we deemed particularly helpful.

[1] https://www.nature.com/articles/s41467-022-29296-3

Definitions

Digital Technology - We define Digital technology by these terms: Digital, pervasive, interactive, and persuasive. It is *digital*: It requires a computer or computerized device (as opposed to a book/newspaper, or analog film for instance). It is *pervasive*: It is a device designed for personal use (smartphones, tablets, laptops). It is *interactive*: It is a software application or website that frequently requires internet access (social media, YouTube, TikTok, most popular video games) or other means to garner user feedback. It is designed to *capture and maintain* user *attention*.

FoMo - Fear of Missing Out.

KYC - Know your Customer. A concept from Banking Regulation that requires banks and other financial institutions to verify customer identities.

SMA - Social Media Addiction. Social Media Use that is beyond the intended use or is otherwise uncontrolled; or creates an urge to check social media that is pervasive regardless of time or activity; or otherwise interferes with or impedes important functions of daily life (school, work, social or family relationships).

SMU - Social Media Use.

Social Media - Those websites, technology platforms or software applications (apps) that focus on the sharing of communication and content in an interactive, digital environment. Currently popular social media sites and platforms include TikTok, Instagram, Snapchat, Facebook, Twitter/X, YouTube, Discord, Reddit, Slack, and video games such as FortNite.

State-Level Social Media Regulation

Legislatures at both the state and federal levels may determine when it is necessary to regulate, prohibit, or monitor potentially harmful markets. For example, Maine has found it has an interest in regulating tobacco and requires a minimum age for purchase. It did so because nicotine is harmful to developing brains; because even nonusers are susceptible to negative health outcomes through second hand smoke; and because the industry did not regulate itself. The tobacco industry became aware of the harms their product caused, but continued to pursue profits at the expense of community and individual health. There are increasingly evident parallels to today's social media and technology companies,[2] and state legislatures across the country are wrestling with their responses.

Maine has the ability to regulate these companies despite, or perhaps because of, the slow pace of Congressional action. Social media company profits have enabled successful lobbying efforts in the past decade[3], hampering attempts at federal regulation. This reality provides state and local policymakers the opportunity to use their powers to place guardrails on social media companies' ability to profit from young users at those children and adolescents' expense. As in other cases where the state has an interest in regulating minors' use of potentially harmful products and services, this area is ripe for policy discussions about the extent to which legislative safeguards are necessary and appropriate.

State regulation is not the only mechanism to rein in social media and technology companies marketing their products to minors. Parents as "household policymakers" play a critical role. However, as in the anti-tobacco use movement, parents' role can be strengthened and made more effective in the context of a strong public health campaign. And, as highlighted in the articles included in the section on "The Attention Economy," the breadth and depth of social media and technology presence in most facets of adolescent life – including their time in schools – suggests a need for a more comprehensive response.

Literature:

1. Social Media and Children 2024 Legislation.
2. MD Passes 2 Major Privacy Bills, Despite Tech Industry Pushback (2024).
3. Attorney General Aaron M. Frey Announces Multi State Lawsuit against Meta for Social Media Harms to Children (2023).
4. New York City is Suing Social Media Companies for Allegedly Harming the Mental Health of Children (2024).
5. 81% of U.S. Adults – Versus 46% of Teens – Favor Parental Consent for Minors to use Social Media (2023).

[2] *https://www.c-span.org/video/?532641-1/social-media-company-ceos-testify-online-child-sexual-exploitation-part-1*;

[3] *https://www.wsj.com/articles/tiktok-ramps-up-lobbying-in-washington-to-try-to-avoid-u-s-ban- 8adffd4a*; *https://www.opensecrets.org/federal-lobbying/clients/summary?id=D000033563*; *https://www.reuters.com/technology/google-us-lobbying-jumps-27-lawmakers-aim-rein-big-tech-2022-01-20/*

Social Media and Children 2024 Legislation	
An interactive website that summarizes information from the National Conference of State Legislatures listing currently pending, recently passed, and recently failed legislative efforts concerned with social media and minors within all states and US territories. *link*	
Key Findings	● While a majority of states have introduced legislation, and several have made headway on legislative action on addressing the impact of social media, the results are mixed, at best. ● **Maine** is one of 14 states not to have introduced any bills aimed at curbing the social media harms caused to minors. ● MA introduced a bill to create a special commission to investigate social media use and safety and potential safeguards and guidelines, specifically to protect children. ● VT passed a bill in the Senate, to be considered by the House, forcing tech companies to use age appropriate design code (including defaulting to highest privacy levels, removing particularly addictive features for young users, and prevent strangers from using social media messaging services to contact young users) ● CA passed several significant measures aimed at reducing specific harms to minors from social media platforms, specifically around substance use and distribution and pornography/child sexual abuse. CA has also passed bills creating social media literacy curriculum. Several other bills relating to social media harms to mental health and addiction are currently pending in CA. ● FL has recently passed a sweeping bill banning the use of social media platforms by those under age 16. At the time of writing, the bill had not been signed by Florida's governor. Florida has previously adopted a bill (H379) prohibiting the use of social media sites on school provided internet access or devices, but has failed to enact other bills relating to social media and minors (H591, H1463) and transparency requirements for technology companies (H1547). ● Multiple states have introduced bills to require social media companies to obtain parental consent for minor users (under 16 or 18). These bills have seen mixed success, failing in CT, pending in others such as IA, and passing in AR, OH, TX, and UT. ● Several states, including MT, have passed legislation creating potential liability for materials published on social media platforms that create harm for minors.

Maryland Passes 2 Major Privacy Bills, Despite Tech Industry Pushback (2024).	
A New York Times article from April 18, 2024 describing the safety and privacy bills, which have yet to be signed by the Governor of Maryland, and the opposition views as well. *link*	
Key Findings	• Maryland Kids Code, modeled on CA Law requiring age-appropriate design code (requiring app developers to restrict the information they collect, turn off particularly addicting features, and other measures for users under 18), but tweaked to avoid free-speech challenges that have stalled implementation of CA law. • Maryland Online Data Privacy Act limits types of data collected, ways that data can be used, and requires app developers to allow consumers access to and some control over data that has been collected and stored.
Key Quotes	• "The Maryland Kids Code, would prohibit certain social media, video game and other online platforms from tracking people under 18 and from using manipulative techniques — like auto-playing videos or bombarding children with notifications — to keep young people glued online." • "The [privacy act] bill would require companies to minimize the data they collected about online consumers. It would also prohibit online services from collecting or sharing intimate personal information — such as data on ethnicity, religion, health, sexual orientation, precise location, biometrics or immigration status — unless it was "strictly necessary."

Attorney General Aaron M. Frey Announces Multi State Lawsuit against Meta for Social Media Harms to Children (2023).	
A 2023 news report issued by the Office of the Maine Attorney General announced the filing of federal and state lawsuits against Meta by 42 attorneys general throughout the U.S. *link*	
Key Findings	● The lawsuit alleges that "the company knowingly designed and deployed harmful features on Instagram and its other social media platforms that purposefully addict children and teens." ● Unfortunately, the state AG's who signed onto this suit are limited by the existing laws, which even if enforced, would not adequately protect young users.
Key Quotes	● "The attorneys general assert that Meta's business practices violate state consumer protection laws and the federal Children's Online Privacy Protection Act (COPPA)" (p. 1). ● "Children are incredibly vulnerable to the manipulation of social media companies. We believe Meta misled the public and prioritized their profits over the health and wellbeing of children," said Attorney General Frey. "The allegations suggest an egregious violation of consumer protection laws and public trust" (pp. 1-2). ● "Meta knew these addictive features harmed young people's physical and mental health, including undermining their ability to get adequate sleep, but did not disclose the harm nor did they make meaningful changes to minimize the harm. Instead, they claimed their platforms were safe for young users" (p. 2).

New York City is suing social media companies for allegedly harming the mental health of children (2024).	
New York City filed a lawsuit against four social media companies accusing them of public nuisance, negligence, and gross negligence. Previously, New York City designated social media a "public health hazard." *link*	
Key Findings	• The lawsuit seeks damages of $100M/year to support the increased demand for youth mental health resources in the city, citing social media's addictive and harmful effects as the cause of the increased demand. • Pressure social media companies to change practices and Federal authorities to pass legislation protecting youth mental health.
Key Quote	• "New York City, like other parts of this nation, is battling an unprecedented mental health crisis among its youth and serious disruption to public health, fueled by Defendants' creation and promotion of addictive and dangerous social media platforms. Youth are now addicted to Defendants' platforms in droves, resulting in substantial interference with school district operations and imposing a large burden on cities, school districts and public hospital systems that provide mental health services to youth" (p. 1).

81% of U.S. adults – versus 46% of teens – favor parental consent for minors to use social media (2023).	
Pew Research Center's 2023 nationally-representative survey of 1,453 teens and 8,842 adults. It is weighted for gender, race and ethnicity, partisan affiliation, education and other categories. *link*	
Key Findings	• 81% of adults and 46% of teens support parental consent for minors to create a social media account. • 71% of adults and 56% of teens support age verification before accessing social media sites. • 69% of adults and 34% of teens support time limits for teens on social media.
Key Quote	• "Our survey finds there is strong bipartisan support for these types of policies. Clear majorities of Republicans and Democrats – including independents who lean to either party – support parental consent, time limits for minors and age verification."

Social Media and Child and Adolescent Wellbeing

This section offers literature that represents the emerging consensus on social media's relationship to child and adolescent wellbeing. Literature included here is peer-reviewed academic research published by reliable sources. The majority of the articles were published within the past four years, although some may be older when more recent research of equivalent quality was not available. We gave preference where possible to studies that examined adolescent populations and those performed in the United States or other Western nations. At times we have included research conducted with adults when studies of similar quality and importance have not yet been done with children or adolescents, especially when we can reasonably assume that potential relationships would also apply to children or adolescents.

We have organized the selected literature into eight topic areas:

1. Social media use levels
2. "The Attention Economy"
3. Developmental considerations
4. Executive function
5. Mental health
6. Social and community health
7. Displaced time in nature

SOCIAL MEDIA USE LEVELS

We begin by offering a foundational understanding of teens' use of social media. Which platforms are they using, how often, and what do they and their parents think about it? Answers to these questions are necessary in order to put the research from the following sections into context. Survey research conducted by Pew Research Center and Gallup in 2023, shared below, indicates that teens used social media almost 5 hours per day, with up to 20% reporting almost constant use of TikTok. Yet a strong majority think that not having their phones makes them feel happy and peaceful. Unsurprisingly, teens have conflicting feelings about their social media use: a strong majority also consider the benefits of use to outweigh the detriments.

Literature:

1. Teens, Social Media and Technology (2023).
2. Teens Spend Average of 4.8 Hours on Social Media Per Day (2023).
3. How Teens and Parents Approach Screen Time (2023).

Teens, Social Media and Technology (2023).	
A 2023 survey of the social media habits of American teenagers ages 13 to 17. This is not a journal article; it is an annual survey of adolescent Social Media and Technology published by the Pew Research Center. It is particularly useful for tracking changes in usage trends over time, for example the changes in how much time is being spent on social media or the relative popularity of various social media platforms. *link*	
Key Findings	• Top social media platforms used by teens in 2023 include YouTube, TikTok, Instagram, and Snapchat. • Social media platforms that were less popular, or are declining in popularity among teens include Facebook, Twitter/X, and Tumblr. • *Up to 1/5th of users reported that they used SM "almost constantly.*" For girls, 22% reported using TikTok almost constantly, for boys 18% reported using YouTube almost constantly. • The report also explored the frequency of social media use among teens with about a third of teens (36%) reporting they spend too much time on social media.
Key Quotes	• **"***YouTube continues to dominate* [emphasis added]. Roughly nine-in-ten teens say they use YouTube, making it the most widely used platform measured in our survey" (p. 2) • "YouTube, the most widely used platform measured in the survey, is also frequently visited by its users… 16% report being on the site *almost constantly* [emphasis added]. 17% who describe their TikTok use as *almost constant* [emphasis added]. About half of teens use Snapchat and Instagram daily. A somewhat larger share reports using Snapchat *almost constantly* [emphasis added]compared with Instagram (14% vs. 8%)]" (p. 4).

Teens Spend Average of 4.8 Hours on Social Media Per Day (2023).	
Gallup's 2023 "Familial & Adolescent Health Survey" was conducted between June & July 2023. 6643 parents, and 1591 teenagers completed the survey, which measures youth activities, parenting practices, mental health and relationship quality. *link*	
Key Findings	• TikTok and YouTube are the most popular social media apps, with teens reporting 1.5 and 1.9 hours of use per day, respectively. • Overall, teens polled averaged 4.8 hours of social media use per day. • Girls used SM more than boys, averaging 5.3 hours of use per day.
Key Quotes	• "Using the larger sample of parents with children aged 3 to 19, one in four parents (25%) strongly agree that they restrict screen time for their children, which does not vary between mothers and fathers." • "(T)hese data show that teens who spend more time on social media rate themselves as being less conscientious more generally and live with parents who are less likely to restrict screen time… these characteristics also predict poor mental health - and seem to explain at least some of the observed relationship between social media use and mental health problems."

How Teens and Parents Approach Screen Time (2024).	
Pew Research Center surveyed 1,453 teens and their parents between September and October 2023. Pew asked respondents to answer questions about device time, emotions relating to use, parents attempts to regulate use, and more. *link*	
Key Findings	• No commentary is offered by the survey's authors, however the significant differences in self-assessed benefits vs harms among teenage respondents indicates a level of confusion or lack of insight. • 74% of teenage respondents reported that NOT having their phone makes them feel happy. • 72% of teenage respondents reported that NOT having their phone makes them feel peaceful. • More teens believe that smartphones have a negative impact on their social skill development (42%) than those who think it has a positive impact (30%). • Most teens (70%) believe that smartphones provide more benefits than harms. • Half of teens (46%) believe that their parent is at least sometimes distracted by a smartphone. Less than a third of parents (31%) believe the same.

THE ATTENTION ECONOMY

Understanding how the Attention Economy works will ground the reader in the source of social media's motivations and profit structures. This section thus includes empirical and theoretical research that describes the context within which adolescents are experiencing social media and the forces driving the algorithms that create and shape their experiences.

Social media, along with much of what would be considered digital or interactive media, is part of a broader economic system that commoditizes user attention. This marketing system is notable for its unique incentive and compensation structures. Users do not "pay" directly for the goods or services offered. Instead, user attention (and data) is sold by the service provider to third party advertisers and other interested buyers. Users literally spend their time and attention in exchange for the services (entertainment) provided by the social media application. Providers therefore have an incentive to maximize the amount of time and attention being spent, regardless of users' well-being. This market is referred to as the "attention economy."

Literature:

1. Is the Attention Economy Noxious? (2020).
2. Ethics of the Attention Economy: The Problem of Social Media Addiction (2021).
3. When Product Markets Become Collective Traps: The Case of Social Media (2023).
4. Drug, demon, or donut? Theorizing the relationship between social media use, digital well-being and digital disconnection (2022).

Is the Attention Economy Noxious? (2020).	
A 2020 peer-reviewed journal article provides an ethical assessment of the attention economy, defined as the market where attention is exchanged for new media. Two heuristics, the harm criterion (both to individuals and society) and the agency criterion (cognitive agency and vulnerability) are used to evaluate markets to identify the ethical implications for how the attention economy should be regulated. *link*	
Key Finding	• The regulation of tobacco products in the United States provides an analogous model for regulating new media.
Key Quote	• "The attention economy is toxic to important human values, because it harms individuals and society and it engenders and exploits weakened cognitive agency and vulnerability. This market, however, is not one that we need to live with in its current form. As we have shown, our analysis sheds some light on the proper regulatory response. We could treat new media as we have treated other harmful, addictive products: we could inform users of its effects and limit children's access to it" (p. 11).

Ethics of the Attention Economy: The Problem of Social Media Addiction (2021).	
A 2021 peer-reviewed article drawing attention to the unique ethical concerns that social media addiction presents for scholars, policymakers, and managers of social media companies. *link*	
Key Finding	• Of particular concern is the demeaning and exploitative nature of social media addiction, which the attention-economy business model of social media companies intentionally incentivizes and promotes.
Key Quotes	• "Much of the communicative and social interaction benefits social media websites deliver can be produced even if social media companies did not introduce the addictive mechanisms that they have designed into their websites, such as the intermittent variable rewards, social validation rewards, and elimination of natural stopping cues that we discussed earlier. These addictive mechanisms are not necessary to provide the communicative, relationship-building, educative, and organizational benefits social media has provided" (p. 333). • "The level of granularity with which the adaptive algorithms are able to tailor their platforms to specific individuals and to do so continuously, automatically, and in real time…Cigarettes do not change themselves to become more addictive for each particular smoker; however, the more a person uses a social media website, the more addictive the website itself becomes for that particular individual" (p. 334). • "(A)ttention-economy businesses—of which social media businesses are the paradigmatic example and our primary focus—have a business model that exhibits an important difference: *it hinges on keeping users active on a platform for prolonged periods of time* [emphasis added]. The longer a user is active and engaged on a social media platform, the more profitable it is for the social media company" (p. 340). • "Well-intentioned teachers often encourage children to become more tech savvy, with an eye to preparing them for college and beyond. But this emphasis on technology in K–12 education, given the high addictive potential of social media, should be carried out with full awareness of its costs. More than that, it is not self-evident that a more technologically advanced class is a more pedagogically advanced class" (p. 343). • "Although much research has focused on the so-called digital divide (the disparity in access to the technology needed for educational and professional success between low- and high-income communities), *there is a different kind of digital divide—call it the digital use divide—where teens in low-income communities are exposed to nearly two hours more per day of screens than teens in wealthier communities* [emphasis added]" (p.343).

When Product Markets Become Collective Traps: The Case of Social Media (2023).	
A 2023 incentivized experiment with over 1,000 college students from various colleges in the U.S. to measure consumer welfare in relation to *consumption spillover for non-users* (i.e., negative utility from not consuming a popular product). The study focused on two prominent media platforms, TikTok and Instagram to examine the associations between consumer surplus and consumer welfare when accounting for consumption spillover. *link*	
Key Findings	● There exists a "*social media trap* for a large share of consumers, who find it individually optimal to use the product even if they derive negative welfare from it" (p. 3). ● A "fear of missing out" plays an important role in driving consumption spillover (negative utility) for non-users.
Key Quotes	● "(M)arket traps, a phenomenon whereby consumers find themselves trapped in an inefficient market equilibrium and prefer the product not to exist, but cannot coordinate to stop using it" (p. 39). ● "(It is) a social media trap for…a large fraction of consumers, who derive large individual consumer surplus but, simultaneously, experience negative welfare from the product" (p. 39). ● "Companies introduce features that exacerbate non-consumer surplus and diminish consumer welfare, rather than enhance it – a practice that might simultaneously increase people's need and thus willingness to purchase these products " (p. 39). ● "This data indicates that the fear of missing out is the most prevalent motive for both TikTok and Instagram. To provide even more direct evidence on the nature of consumption spillovers to non-users, we ask respondents another open-ended question about their feelings if they were the only ones who had to deactivate their accounts and everyone else kept using them. A large fraction of active Instagram and TikTok users express negative feelings, particularly the fear of missing out. *Paired with our main estimates, the evidence of these underlying mechanisms supports the notion that accounting for non-consumer surplus is crucial to assessing the welfare effects of social media platforms* [emphasis added]" (p. 4). ● **"***Our findings challenge the standard revealed-preference argument that the mere existence of a market implies positive welfare* [emphasis added], even for consumers with rational expectations. Indeed, we provide evidence of a product that is consumed by a large share of individuals, even when it creates negative welfare for many of them. *This finding suggests a heightened need for regulators to assess whether different products create traps for consumers and whether they actually generate positive welfare* [emphasis added]" (p. 5).

Drug, demon, or donut? Theorizing the relationship between social media use, digital well-being and digital disconnection (2022).	
Drawing from three social media metaphors - the drug, demon and donut - this 2022 peer-reviewed article aims to advance understanding of digital well-being and the use of social media disconnection as a remedy for social media overuse. It develops a classification of disconnective mechanisms in accordance with the three metaphors of social media overuse. *link*	
Key Finding	• Theory-driven evidence can be provided for differing social media disconnection mechanisms.
Key Quotes	• "In the US, 51% of teens and 23% of their parents find that they spend too much time on social media" (pp. 1-2). • "Experiences of time displacement, interference, and overload represent a real problem that people experience in relation to the constant presence of social media in their lives" (p. 2). • Present Table 1 Illustrative (non-exhaustive) overview of concepts used to study and define social media overuse (p. 3). • "In terms of user agency, the demon metaphor makes social media platforms complicit to social media overuse: They are agentic in the sense that they capitalize on human weaknesses" (p. 3)

DEVELOPMENTAL CONSIDERATIONS

The research included in this section explains why it is crucial to consider user age when discussing social media use. While studies on the various impacts of social media on adolescents are still emerging, the literature around the concept of "developmental windows" is well established. Simply, some things are going to have a greater impact depending on how old one is when one experiences them. A well understood example is the child or teen's relatively greater ability, compared with an adult, to learn a new language.

When thinking about developmental windows and social media/technology use, one should hold two different concepts in mind. The first concept is user age. The same device or app use can have very different impacts depending on a user's age; a 12 year old and a 17 year old using the same social media platform will have different experiences and different outcomes as a result. The second concept is "age of first use." Two 16-year-olds, one of whom has just downloaded a social media app for the very first time and one who has been using social media since age 10, will have different experiences, and, potentially, outcomes, from using social media. We have prioritized studies that consider both of these elements.

Young users are a vitally important demographic for social media and technology companies. They yield present-day profits, and also build a future market share for preferred apps and platforms. Social media applications have age restrictions, typically with minimum user age of 13 to comply with the federal Children's Online Privacy Protection Act (COPPA). This 1998 Federal law regulates the collection of private or personally identifiable data from minors under the age of 13. Even with such limits, social media apps and platforms generated at least $11 billion from minor users in 2022. It is estimated that YouTube, Facebook and Instagram alone made $2 billion of that $11 billion from users age 12 or younger.[4]

Recent state-level policies designed to protect young users most often aim to tighten age restrictions on social media use. This choice puts the onus on social media companies to prevent children and young teens from the worst effects of using their products. Delaying the age of first use to after the most sensitive developmental window, which is different for boys (14-16) and girls (11-14), is key. The first section of this document, "Social Media Regulation and the State Legislature" on page 3, offers an overview of the current policy landscape.

Literature:

1. Windows of developmental sensitivity to social media (2022).
2. Associations of early social media initiation on digital behaviors and the moderating role of limiting use (2022).
3. Quantity, Content, and Context Matter: Associations Among Social Technology Use and Sleep Habits in Early Adolescents (2021).

[4] *https://www.hsph.harvard.edu/news/press-releases/social-media-platforms-generate-billions-in-annual-ad-revenue-from-u-s-youth/*

Windows of developmental sensitivity to social media (2022).	
A 2022 peer-reviewed study involving a cross-sectional analysis of two UK datasets of 84,011 participants (10-80 years old) that examines the relationship between self-reported estimates of social media and life satisfaction. *link*	
Key Findings	• Younger adolescents reported the most negative ratings at that intersection. • In addition, a longitudinal analysis of a smaller subset of the data (17,409 participants 10-21 years old) suggests distinct developmental windows of sensitivity to social media in adolescence related to age and sex: early adolescence for girls, mid-adolescence for boys, and late adolescence for both.
Key Quotes	• "Much needed progress in understanding how social media use affects well-being could be made by studying the phenomenon through a developmental lens, acknowledging that developmental processes can alter our sensitivity to both the positive and negative impacts of social media" (p. 2). • "For females, we observed a window of sensitivity to social media between the ages of 11 and 13, when increases in estimated social media use from expected levels predicted a decrease in life satisfaction ratings from expected levels one year later…. For males a similar window was in evidence at ages 14 and 15… A later increase in sensitivity to social media, which was present at age 19 for both sexes, suggested a different underlying process may be present in late adolescence" (p. 5).

Associations of early social media initiation on digital behaviors and the moderating role of limiting use (2022).	
Participants from middle schools in the Northeast U.S. (N = 773; 11–15 years, Mean = 12.6) completed a cross-sectional survey about social media initiation, digital behaviors, and parental restrictions on digital use. *link*	
Key Findings	• Initial use of social media platforms (Instagram or Snapchat) at late childhood (age 10) is significantly associated with negative and problematic online behaviors and outcomes compared with peers who initiated first use at later ages. • The younger the age of adoption of social media platforms, the more likely users were to check social media, suffer from fear of missing out (FoMO), experience online or sexual harassment, and report "problematic digital technology use."
Key Quotes	• "...Childhood (10 and younger) and tween initiators (aged 11 and 12) did demonstrate significantly more problematic digital behaviors and relationships and less sympathetic behaviors than their 13 year old and older initiator counterparts" (p. 14). • "While limit setting may act differently for child and teen initiators, later initiation in our sample is linked with lower reports of FoMO, regardless of the level of parental limit setting reported" (p. 15).

Quantity, Content, and Context Matter: Associations Among Social Technology Use and Sleep Habits in Early Adolescents (2021).	
A 2021 peer-reviewed study of social media usage and impacts on sleep habits among approx. 750 early adolescents (11-15 years old) in the US Northeast. *link*	
Key Findings	● Increased sleep duration was linked to ○ Later age of smartphone acquisition and ○ parental rules around bedtime and technology use. ● Decreased sleep duration and quality was linked to ○ quantity of social media use (frequency and duration of checking), ○ type of content viewed (examples include violent or risky content, emotionally charged content), and ○ social context (lack of parental restrictions on phone use, especially at bedtime).
Key Quotes	● "More frequently engaging in checking SM, problematic internet behaviors, fear of missing out, problematic digital technology use, and watching more emotional or violent videos were significantly related to later bedtimes and fewer hours of sleep on a typical school night. Participants who acknowledged losing sleep because they could not quit online activities went to bed later and slept less" (p. 164). ● "The specific predictors that we identified should be tested as intervention targets toward healthier sleep habits in early adolescents, such as parental phone restrictions, *age at SM initiation* [emphasis added], or online peer obligations that are magnified with particular SM sites" (p. 165).

EXECUTIVE FUNCTION

Executive functioning coordinates our cognitive skills to plan, organize, and otherwise execute cognitive tasks. It involves cognitive flexibility, memory, and self control — including attention. The role of executive functioning, including attention, in academic and workplace settings and outcomes is well documented. However, the role of social media use in executive functioning in children and adolescents on a day-to-day basis is not clear. Neither is there a rigorous body of literature addressing the long-term impacts of social media use on executive function, or attention specifically.

Rigorous studies proving causation — that media multitasking or social media use causes reduced executive functioning or cognitive performance — do not exist. Like most areas of social science, this type of research is exceedingly challenging because the type of experiments that could show causation are unfeasible at best, and unethical at worst. What does exist are strong correlational studies indicating a negative association between social media use and evidence of executive functioning.

One of the challenges here is that those people with lower levels of attentional capacity, for whatever reason, may very well already have lower levels of cognitive performance as measured by academic outcomes. And those who have lower levels of attention may tend to seek out experiences on social media and perform social media multitasking more often than those with higher levels of concentration. Correlational studies can be highly informative, nonetheless, especially when taken in the context of each other.

Literature:

1. The mediating role of attention control in the link between multitasking with social media and academic performances among adolescents (2021).
2. Disengagement during lectures: Media multitasking and mind wandering in university classrooms (2019).
3. Media Multitasking and Cognitive, Psychological, Neural, and Learning Differences (2017).
4. Association of Digital Media Use With Subsequent Symptoms of Attention-Deficit/Hyperactivity Disorder Among Adolescents (2018)

The mediating role of attention control in the link between multitasking with social media and academic performances among adolescents (2021).	
A 2021 peer-reviewed study using a correlational research design to study the association of Social Media Multitasking (SMM) with the academic performance of 637 Scandinavian adolescents was tracked, with the role of attention/self-regulation as a mediating influence investigated. *link*	
Key Findings	• Multitasking with social media was found to be negatively and significantly associated with academic performance. • Attention control was found to be positively and significantly associated with academic performance.
Key Quote	• "(C)onclusions of the study suggest a critical role for attention control in decreasing negative effect of multitasking with social media on academic performances of adolescents in high school setting" (p. 493).

Disengagement during lectures: Media multitasking and mind wandering in university classrooms (2019).	
A 2019 peer-reviewed quantitative study of the impacts of either media multitasking or mind-wandering during live lectures/lessons (*n*=200). *link*	
Key Finding	• Media-multitasking (using smartphones or laptops for purposes unrelated to course content) was associated with negative academic outcomes.
Key Quotes	• "We found that media multitasking, but not mind wandering, was negatively associated with learning outcomes, and correspondingly, that media multitasking was reliably associated with poorer learning than was mind wandering" (p. 85). • "...media multitasking may be a more insidious form of disengagement that captures attention more completely, undermines one's ability to balance off-task behavior and focal task demands, and ultimately results in greater impairments in performance" (p. 86).

Media Multitasking and Cognitive, Psychological, Neural, and Learning Differences (2017).	
A 2017 report by the Center for Children and Screens, surveying the existing literature on the associations of Media Multitasking with cognitive performance and learning outcomes. *link*	
Key Findings	• Multiple studies cited in which various forms of Media Multitasking (MM), including text messaging, watching television or online video (YouTube) or engaging in social media, are negatively associated with performance on measured cognitive tasks, as well as long-term academic performance as measured by GPA. • Heavier Media Multitaskers were more likely to score highly on measures of impulsivity, and had to exert greater attentional effort to maintain focus in the presence of potentially distracting Media. • It was too early (in 2017) to draw a conclusion, but the presence of distracting media could be particularly harmful (if harm is measured by reduced academic performance) to users who measure high on impulsivity and low on ability to maintain focus.
Key Quotes	• "Beyond impulsivity, MMT has been associated with increased sensation-seeking, social anxiety and depression,lower perceived social success, and neuroticism, as well as a lower belief that intelligence is malleable" (p. S63). • "Studies investigating multitasking with media while learning (eg, receiving in-class texts) have demonstrated a negative association with GPA. Although Lin et al, reported a limited association between MMT and GPA, they did find that Facebook and text message use negatively predicted GPA" (p. S64).

Association of Digital Media Use With Subsequent Symptoms of Attention-Deficit/Hyperactivity Disorder Among Adolescents (2018).	
A longitudinal study of 3051 students in 10 high schools over two years (2014 - 2016) "to determine whether the frequency of using digital media among 15- and 16-year-olds without significant ADHD symptoms is associated with subsequent occurrence of ADHD symptoms during a 24-month follow-up." *link*	
Key Findings	• Adolescents who did not have significant symptoms of ADHD at the outset of the study and who were heavy users of digital media, including social media, had a statistically significant likelihood of developing symptoms of ADHD when reassessed after two years. • Texting, chatting online, playing games with others, and posting their own photos or updates in particular were not linked to a statistically significant increase in the likelihood of ADHD symptoms. • However the more types of digital media that were used with high frequency, the higher the likelihood of the adolescent developing ADHD symptoms.
Key Quotes	• "Although alternative explanations remain possible, modern digital media use could play a role in the development of ADHD symptoms. The primary symptoms of ADHD are inattention (eg, distractibility, trouble with organization) and hyperactivity-impulsivity (eg, difficulty waiting, interrupting others, restlessness). Modern media devices immediately notify users when new text messages, social media postings, or videogame play invitations arrive. Exposure to such notifications may draw attention away from focal tasks. Frequent distractions could disrupt normative development of sustained attention and organization skills. Additionally, modern media platforms provide instantaneous access to highly stimulating experiences and rapid feedback in response to user input. An array of information, music, television programs, movies, video games, or digital social interactions are immediately accessible with modern media. Consequently, high-frequency modern digital media users may become accustomed to rapid feedback, which could disrupt development of impulse control and patience" (p. 261). • "Statistical adjustment for familial factors and other stigmatized behaviors sensitive to reporting biases, including family history of substance use, depressive symptoms, and delinquency, did not meaningfully affect the association" (p. 261).

MENTAL HEALTH

"Mental health is a state of mind characterized by emotional well-being, good behavioral adjustment, relative freedom from anxiety and disabling symptoms, and a capacity to establish constructive relationships and cope with the ordinary demands and stresses of life."[5]

While social media has been in widespread use for over 15 years, research identifying the direct impacts of social media use is much more recent, with few peer-reviewed articles documenting causality. Therefore, the literature below focuses on the association of social media use with mental health outcomes, however it also includes a few studies that imply causality. Proving causality is very challenging due to the ubiquitous nature of social media use among young people and therefore the lack of access to control groups. As Jean Twenge puts it: "Identifying the mechanisms underlying trends in mental health is necessarily difficult as experimental trials are not possible: Adolescents cannot be randomly assigned to experience different eras. Thus, we must turn to correlational research to provide evidence."[6]

Literature:

1. Social Media and Mental Health (2022).
2. Frequent Social Media Use and Its Prospective Association With Mental Health Problems in a Representative Panel Sample of US Adolescents (2022).
3. Increases in Depressive Symptoms, Suicide-Related Outcomes, and Suicide Rates Among U.S. Adolescents After 2010 and Links to Increased New Media Screen Time (2017).
4. Which social media platforms matter and for whom? Examining moderators of links between adolescents' social media use and depressive symptoms (2023).
5. Emotional Responses to Social Media Experiences Among Adolescents: Longitudinal Associations with Depressive Symptoms (2022).
6. Understanding Links Between Social Media Use, Sleep and Mental Health: Recent Progress and Current Challenges (2019).
7. Interplay between social media use, sleep quality, and mental health in youth: A systematic review (2021).
8. Gender differences in associations between digital media use and psychological well-being: Evidence from three large datasets (2020).
9. The Consequences of Social Media Use Across the Transition Into Adolescence: Body Image and Physical Activity (2023).
10. Social media as an incubator of personality and behavioral psychopathology: Symptom and disorder authenticity or psychosomatic social contagion? (2023).
11. Stop that! It's not Tourette's but a new type of mass sociogenic illness (2021).

[5] https://dictionary.apa.org/mental-health

[6] https://journals.sagepub.com/doi/abs/10.1177/2167702617723376?journalCode=cpxa

Social Media and Mental Health (2022).	
A 2022 peer-reviewed study of the impact of social media on mental health. Using two main data sets, the dates in which Facebook was introduced at 775 US colleges and the answers to seventeen consecutive waves of the National College Health Assessment (NCHA), the researchers use a generalized difference-in-differences research design to provide quasi-experimental estimates of the impact of social media on mental health. *link*	
Key Finding	• The rollout of Facebook at colleges had a negative impact on student mental health and increased the likelihood with which students reported experiencing impairments to academic performance due to poor mental health.
Key Quote	• **“**We find that the rollout of Facebook at a college had a negative impact on student mental health. It also increased the likelihood with which students reported experiencing impairments to academic performance due to poor mental health. Additional evidence on mechanisms suggests the results are due to Facebook fostering unfavorable social comparisons” (p. 3660).

Frequent Social Media Use and Its Prospective Association With Mental Health Problems in a Representative Panel Sample of US Adolescents (2022).	
The Population Assessment of Tobacco and Health (PATH) study, which also includes questions beyond tobacco use, is an ongoing, nationally-representative prospective cohort study. Data from 5,100 US adolescents, aged 12-14 in 2014, was collected from four "waves" of the study through 2018. In other words, data came from four annual studies of the same 5100 teenagers. Note: Although the study utilized data from the same participants over the four years of the PATH study, data was not collected on the type/platform of social media being used. *link*	
Key Findings	• Social media use was found to negatively impact mental health outcomes for both boys and girls, although the "trajectories" of those mental health changes varied by gender. That is to say the trend lines over time for boys and girls increased, decreased or plateaued at different times. • Social media was a substantial contributing explanation for adolescent mental health status, for all genders. • Social media use was found to be a significant factor in the use of alcohol by boys, but not for alcohol use by girls. Alcohol use is linked to decreased mental health across the board. • Without social media, the noted decrease in girls' mental health status slowed and even stopped over time. With social media, the declines in girls' mental health status continued on a downward trajectory, defying what appears to be a developmental trend.
Key Quote	• "Girls showed relatively poorer mental health status compared to boys at baseline and directionality of the mental health growth pattern was opposite. That is, although boys showed a linear improving mental health growth pattern, girls showed a linear deteriorating growth pattern over the study period (2013-2018) " (p. 802).

Increases in Depressive Symptoms, Suicide-Related Outcomes, and Suicide Rates Among U.S. Adolescents After 2010 and Links to Increased New Media Screen Time (2017).	
This is a seminal study by well-known researcher Jean Twenge and colleagues. It uses two large, nationally representative surveys of teens in grades 8 through 12 (N = 506,820) combined with CDC statistics on suicide deaths for teens ages 13 to 18. It analyses depressive symptoms, suicide-related outcomes, and suicide rates from 1991 to 2015 in relation to screen-based and non-screen-based activities. *link*	
Key Findings	• Starting in the 2010s, depressive symptoms rose among teens, with females being disproportionately affected. • More time on screens was associated with higher likelihood of high levels of depressive symptoms or at least one suicide-related outcome. However, TV viewing had a minimal association with depressive symptoms when compared with electronic device use. • Sports and exercise and religious service attendance, but not jobs, had the strongest negative correlation (moderate) with depressive symptoms.
Key Quotes	• "Beyond the lives lost to suicide, death by suicide has significant emotional and economic costs, resulting in approximately $44.6 billion a year in combined medical and work loss costs in the United States alone (CDC, 2017)" (p. 1). • "Adolescents who spent more time on screen activities were significantly more likely to have high depressive symptoms or have at least one suicide-related outcome, and those who spent more time on nonscreen activities were less likely" (p. 9). • "(A)dolescents using electronic devices 3 or more hours a day were 34% more likely to have at least one suicide-related outcome than those using devices 2 or fewer hours a day, and adolescents using social media sites every day were 13% more likely to report high levels of depressive symptoms than those using social media less often" (p. 9). • Among those low in in-person social interaction, social media use had a significant effect on depressive symptoms, $F(1, 9{,}795) = 185.35$, $p < 001$, but among those high in in-person social interaction, social media did not have a significant effect, $F(1, 11{,}271) = 2.21$, $p = .14$" (p 9). • "(I)ncreases in new media screen activities and the decreases in nonscreen activities may explain why depression and suicide increased among U.S. adolescents since 2010: Teens have spent more time on activities associated with increased risk of mental health issues and less time on activities associated with decreased risk of mental health issues" (p. 13). • "(W)ithout experimental evidence, we can not be certain that the increase in new media screen time is the cause of the increase in mental health issues after 2011. It is possible, for example, that mental health issues increased for some other unknown reason and depressed teens were more likely to spend time on screens. However, three previous studies provide evidence that screen time, particularly social media use, may cause depressed mood rather than vice versa, at least among adults" (p. 14).

Which social media platforms matter and for whom? Examining moderators of links between adolescents' social media use and depressive symptoms (2023).	
Data was collected in 2018-2020 from 237 American adolescents to investigate associations between social media use (total time and time spent on specific platforms) and depression. *link*	
Key Findings	• The greater the total time spent on social media, the higher the levels of depressive symptoms. • Not all social media platforms were implicated equally, with gender and personality differences being found to exacerbate or minimize harms. (For example, Twitter/X was found to increase depressive symptoms in girls but not boys; extroversion appears to be protective from the negative impacts of Instagram).
Key Quotes	• "Our results demonstrate that more frequent social media use is related to higher levels of depressive symptoms even when covarying [with] *sic* earlier symptoms. *This suggests that it is not simply that more depressed youth seek out more social media and are prone to more symptoms* [emphasis added]**"** (p. 1740). • "(C)onsistent with the displacement hypothesis, youth who frequently use YouTube may be missing out on potentially healthier in-person experiences and social interactions with friends or family" (p. 1740).

Emotional Responses to Social Media Experiences Among Adolescents: Longitudinal Associations with Depressive Symptoms (2022).	
A 2022 longitudinal study measuring depressive symptoms and emotional responses to social media among 697 teenagers. Depressive symptoms and social media experiences were measured twice, at a one-year interval. *link*	
Key Findings	• Greater participant reports of positive emotional responses to social media experiences were predictive of greater levels of depressive symptoms after one year. • Higher reported levels of depressive symptoms were predictive of more frequent negative emotional responses to social media. • Girls reported more frequent positive and negative responses to social media than their male peers. However, the bi-directional relationship between social media experiences and depressive symptoms was present for both boys and girls.
Key Quotes	• "(I)t is possible that youth reporting higher levels of positive emotional responses to social media use may be relying more on social media, rather than in-person interactions, for affectively (emotionally) rewarding peer experiences.This may be due to a preference for online versus in-person relationships, or may be the result of social skills deficits that inhibit certain youths' abilities to create and maintain in-person friendships. Studies support the importance of social connection to mitigate depression risk" (p 917). • "(A)dolescents with elevated depressive symptoms are more likely to report engaging in social media to cope with and regulate emotions. However, seeking out support to manage distress via social media may also expose adolescents to the likelihood of having online experiences to which they experience negative emotional responses" (p. 918).

Understanding Links Between Social Media Use, Sleep and Mental Health: Recent Progress and Current Challenges (2019).	
A 2019 review of recent developments in sleep and mental health research. *link*	
Key Findings	• There is a need to expand research beyond the current technology perspective which measures the impact of social media use on sleep outcomes based on the duration, frequency, and timing of individuals' social media activity. • Research also needs to include a social interaction perspective that explores *how* individuals engage with social media in determining positive versus negative mental health outcomes (e.g., considering social, emotional, and cognitive components of users' experiences).
Key Quotes	• "(T)o meaningfully inform clinical practice and wider policy, it is crucial to remember that conceptualizing social media use in minutes and hours only gives one part of the picture. It is important to consider the wider content around time spent using social media to avoid oversimplification in policy and practice that reduces "social media use" from a complex range of experiences and social interactions to a single number (represented only in hours per day)" (p. 143). • "For example, individuals who spend the same time using social media each day (or night) can differ in the level of emotional connection that they feel towards this activity. Young people in particular often report feelings of disconnectedness and missing out without access to social media and prefer to keep their phones within close reach during the night. This has implications for sleep outcomes, as highly invested users report poorer sleep quality and may find it more difficult to disengage from social media at night. This reinforces the need to consider social media use within the broader context of an individual's online *and* offline social interactions, as a strong connection to social media platforms can stem from a more pervasis anxiety about potentially missing out. This underlying fear of missing out has been linked to shorter duration via both a behavioral pathway (by driving late night social media use, which delays bedtimes) and a cognitive pathway (by increasing pre-sleep cognitive arousal, thus further delaying sleep onset). Therefore, individuals who are concerned about possibly missing out may struggle at bedtime to stop not only *using* social media, but also *thinking* about possible social media interactions" (p. 143).

Interplay between social media use, sleep quality, and mental health in youth: A systematic review (2021).	
A 2021 comprehensive review of how social media, sleep quality, and mental health interact in adolescents and young adults. Includes twenty-eight cross-sectional studies and five prospective cohort studies consisting of 228,079 participants aged 11- to 29-years-old. *link*	
Key Findings	● There are significant associations between ○ excessive social media use and negative mental health outcomes and ○ poor sleep quality and excess social media use and negative mental health outcomes. ● Social media use frequency is a risk factor for both mental health and poor sleep outcomes.
Key Quotes	● "Poor sleep is associated with excessive daytime sleepiness, depressed mood, and difficulty concentrating, as well as more insidious, long-term outcomes such as chronic disease…this is a particularly important issue for youth, as sleep disruption has a negative effect on psychosocial health and may promote risky behaviors such as abuse of nicotine and marijuana. However, the current literature suggests links between sleep hygiene and psychological issues to be bidirectional" (p. 1). ● "Several of the cross-sectional and longitudinal studies in this review suggest sleep as a potential mediator of relationships between social media use and mental health…Social media use around bedtime can delay sleep onset and reduce sleep duration, especially due to the constraints of waking early for school or work. When combined with the cognitive and often emotional arousal that arises with social media content appraisal, such reduced sleep can be restless and lead to negative affect when performed habitually…such negative impacts on sleep can have adverse health effects, particularly reduced psychological well-being and cognitive functioning. These health impacts are pertinent to youth, who do not always have the ability to compensate for the lack of sleep by simply sleeping longer" (pp. 6-10).

Gender differences in associations between digital media use and psychological well-being: Evidence from three large datasets (2020).	
A 2020 peer-reviewed study utilizing three large, representative surveys of 13- to 18-year-old adolescents in the U.S. and UK (total *N* = 221,096) examining digital media use in hours per day and several measures of psychological well-being in each of the three datasets. *link*	
Key Findings	• Adolescent girls spent more time on smartphones, social media, texting, general computer use, and online, whereas boys spent more time gaming and on electronic devices in general. • Associations between moderate or heavy digital media use and low psychological well-being/mental health issues were generally larger for girls than for boys. • Light users of digital media were slightly higher in well-being than non-users, with larger differences among boys. • Among both genders, heavy users of digital media were often twice as likely as low users to be low in well-being or have mental health issues, including risk factors for suicide.
Key Quotes	• "Adolescent boys and girls differ in their digital media activities, with girls spending more time on social media and smartphones and boys spending more time gaming. There were also gender differences in the association between digital media time and psychological well-being. Associations between heavy (vs. light) digital media use and lower well-being were larger among girls, but associations between light (vs. no) digital media use and higher well-being were larger among boys" (p. 95).

The Consequences of Social Media Use Across the Transition Into Adolescence: Body Image and Physical Activity (2023).	
A 2023 peer-reviewed study investigating moderators of short-term longitudinal associations from social media use to changes in body satisfaction and physical activity. Participants included 296 third-sixth grade students (144 girls, 152 boys) ages 8-13 attending public schools in Florida. *link*	
Key Findings	• "(S)ome pre- and early adolescents are particularly vulnerable to adverse outcomes arising from social media use" (p. 959). • Peer conformity amplifies the risks of social media use.
Key Quotes	• "The results indicated that higher initial social media use was associated with greater subsequent decreases in body satisfaction and physical activity, but only for children high on susceptibility to peer influence" (p.947) • "The present study is unique in that it is one of the first to examine the effects of social media use on body satisfaction across the transition into adolescence and the first to examine susceptibility to peer influence as a moderator of the effects of social media use" (p. 950). • "Declines in body satisfaction during adolescence-documented well before the advent of widespread social media use-are not a new phenomenon. The advent of social media use, however, has exacerbated the problem for many youth by providing ubiquitous opportunities for body comparisons. We are not the first to observe that adolescent social media use anticipates declining body satisfaction among young adolescents. Our study is novel in that it extends evidence for adverse consequences linked to social media use downward, to the years that precede the age when youth are technically eligible to participate on most platforms" (p.957). • "Peers occupy a position of special significance in the lives of pre- and early adolescents. Unique to our study is the recognition that some adolescents are more prone to conformity than others and that these individual differences may shape responses to social media" (p. 957). • "If there is good news, it is that the adverse consequences of elevated social media exposure were limited to youth who reported high trait-like conformity tendencies. *In an ideal world, strictures against social media participation by preteens would be enforced. Until that time, parents and practitioners should be alert to the dangers of social media exposure among children who are open to peer influence* [emphasis added]**"** (pp. 957-958).

Social media as an incubator of personality and behavioral psychopathology: Symptom and disorder authenticity or psychosomatic social contagion? (2023).	
A 2023 peer-reviewed journal article that provides a detailed historical overview of social media as a personality and behavioral psychopathology. *link*	
Key Findings	• For a subset of predominantly adolescent-aged female youth, use of audiovisual-based social media platforms such as TikTok and Instagram, especially at moderate and high levels, is associated with ○ the manifestation and development of functional tic-like behaviors, ○ less self-reported levels of psychological well-being, ○ increased internalizing symptomatology, and ○ self-diagnosis of various mental illnesses.
Key Quote	• "While not inherently stressful per se, the social media environment is a relatively novel environment in evolutionary history and the negotiation of social relationships through the scopic medium of increasingly algorithmic, audiovisual social media may pose a unique set of conditions that place individuals… at increased risk for the development of psychopathology" (p. 3).

Stop that! It's not Tourette's but a new type of mass sociogenic illness (2021).	
A 2021 peer-reviewed report on a new type of mass sociogenic illness (MSI) that is spread solely via social media. Due to the unique nature of this novel form of MSI, a new term has emerged, 'mass social media-induced illness' (MSMI). A current illustration of MSMI is the global Tourette-like illness outbreak being spread via videos featured on YouTube, TikTok, and Instagram. *link*	
Key Finding	• The current outbreak of MSMI is being triggered among young people due to eco-anxiety, the COVID-29 pandemic, and further challenges in post-modern society.
Key Quote	• "...(T)his current outbreak of MSMI (Mass Social Media Illness) represents not only the 'modern' form of MSI (Mass Sociogenic Illness) motor variant, but can also be viewed as the 21st century expression of a 'culture-bound stress reaction of our post-modern society emphasizing the uniqueness of individuals and valuing their alleged exceptionality, thus promoting attention-seeking behaviors, and aggravating the permanent identity crisis of modern human. It can be assumed this is triggered by eco-anxiety, the COVID-19 pandemic and further challenges in post-modern society" (p. 256).

SOCIAL AND COMMUNITY HEALTH

Social media has become a primary tool for engaging individuals politically, and for many adolescents, it is the main source of news, information, and trends. This elevates the issues of disinformation and misinformation, which are exacerbated by algorithmic targeting used by social media platforms. Beyond this, compelling new research indicates that many users feel "trapped" by social media, continuing to use it for fear of missing out (FOMO) even though they perceive its overall impact to be negative (see article titled "When Product Markets Become Collective Traps: The Case of Social Media (2023)" detailed above). These effects are interrelated with the impacts on mental health that were presented in the previous section.

Most of the studies in this section feature adult populations based on the assumption that negative effects, if not the positive ones, on adult populations in this context would likely also be present in adolescents. At the very least, social media effects on adults play a large role in creating the civic and cultural worlds that adolescents are entering.

Literature:

1. Frequency of using social media as a source of news in the United States as of August 2022, by generation (2022).
2. Out-group animosity drives engagement on social media (2021).
3. The Paradox of Participation Versus Misinformation: Social Media, Political Engagement, and the Spread of Misinformation (2019).

Frequency of using social media as a source of news in the United States as of August 2022, by generation (2022).	
An online survey administered by Statista between August 11-17, 2022. 4,421 respondents ages 18 years and older provided data on how frequently members of different generations used social media to find and follow the news. *link*	
Key Findings	● Among Gen Z respondents, 50% reported using social media for their news source daily. An additional 20% reported using social media for news at least a few times per week. ● For Gen X respondents, the percentage of daily social media news sources was 39%, for Baby Boomers the rate was 24%.

Out-group animosity drives engagement on social media (2021).	
An analysis of almost 3 million social media posts from news organization accounts and US congressional members on two social media platforms (Facebook and Twitter/X). *link*	
Key Findings	● "Out-group" language drove user engagement by 67%. ● "Out-group" language is a significantly higher driver of user engagement than either negative affect or moral-emotional language. ● Out-group animosity is shown to drive political polarization.
Key Quote	● "(O)ut-group language is the strongest predictor of social media engagement across all relevant predictors measured, suggesting that social media may be creating perverse incentives for content expressing out-group animosity" (p. 1).

The Paradox of Participation Versus Misinformation: Social Media, Political Engagement, and the Spread of Misinformation (2019).	
A 2019 peer-reviewed study using a two-wave panel survey of 451 online media users in Chile to examine the connections between news use on social media with individuals' political engagement and misinformation diffusion. *link*	
Key Finding	• Social media use for accessing news can lead to the spread of misinformation, albeit indirectly, due to its association with individuals' political participation" (p. 814).
Key Quotes	• "Although being politically engaged does not make users more or less likely to be misinformed, participatory users seem more likely to share inaccurate claims regarding governmental affairs, science, and natural disasters than those who are less politically engaged" (p. 814). • "social media users who share misinformation also share much other information…Hence, knowledgeability about some hard facts, as a consequence of using social media, may be sufficient for political participation, but may be insufficient to prevent misinformation spreading" (p. 815). • "Using a platform for informational purposes, such as Twitter (X) or Facebook allow, can motivate users to become more politically engaged. *Increased political engagement is correlated with increased spread of content, including misinformation.* The addition of the concept of increased engagement's association with sharing of misinformation complicates the narrative of most research, which has traditionally addressed the nexus between informational uses of social media and political engagement in positive tones. *For too long, researchers – including the authors of this article – have described engagement in positive terms* [emphasis added]" (p. 815).

DISPLACED TIME IN NATURE

Displacement describes the idea that an individual has to make choices about how to spend their time and attention. If they are spending time and attention on social media or other technology, they are not spending that time or attention on other, potentially beneficial activities. The loss of the benefits from engaging in those activities constitutes an opportunity cost, even if there is no direct harm from the social media engagement itself.

Given the intentionally addictive nature of social media and other digital technologies, particular attention can be paid to the most beneficial activities that are most vulnerable to displacement. Time in nature is such an activity: it has clear scientific evidence of both strong positive effects on mental health and overall wellbeing and also a high potential for displacement by social media use. The true extent of the potential harms caused by social media or digital technologies displacing time that would otherwise be spent engaged in outdoor activities is largely unknown due to a dearth of research on the topic. The best study to date, a 2020 meta-analysis comparing "screen time" to "green time," while broad in definition, indicates a range of negative impacts from screen time and a range of positive impacts from green time.

Additionally, there is consensus that time spent making and developing real-time, in-person social relationships with family, friends, and fellow community members is a beneficial activity that is vulnerable to displacement by use of social media and other attention demanding online activities. This is of particular interest when discussing children and adolescents due to the developmental windows we know exist for developing social skills. We mention social skill development here to ensure it is considered alongside time in nature, but we do not include bibliographic references due to the clear scientific and cultural consensus on its importance.

<u>Literature:</u>

1. The Relationship Between Greenspace Exposure and Psychopathology Symptoms: A Systematic Review (2022).
2. Psychological impacts of "screen time" and "green time" for children and adolescents: A systematic scoping review (2020).

The Relationship Between Greenspace Exposure and Psychopathology Symptoms: A Systematic Review (2022).	
A 2022 systematic review of the existing literature examining the interplay between exposure to natural environments (greenspace) and psychopathology (including ADD/ADHD in children, and depression in adults). Authors reviewed 40 studies from previous 20+ years of research. *link*	
Key Findings	• Greenspace exposure was largely correlated with less severe and lower rates of psychopathology (Attentional disorders in children/adolescents, depression in adults). • ADD/ADHD most commonly reported to be responsive to nature exposure among children and adolescents. • Greenspace/nature found to buffer negative impacts of urban/man-made spaces
Key Quotes	• "The evidence largely suggests that greenspace exposure is associated with less severe and/or decreased prevalence of psychopathology. This was most consistently observed in ADHD in children and depression in adults" (p.218). • "A few studies that found a positive effect of greenspace exposure on depression symptoms found that increased physical or social activity mediated these relationships" (p. 219). • "Greenspaces may be psychologically beneficial through mechanisms that influence cognitive and affective processes (e.g., stress reduction) that, in turn, affect psychopathology" (p. 219).

Psychological impacts of "screen time" and "green time" for children and adolescents: A systematic scoping review (2020).	
A peer-reviewed systematic scoping study of the literature examining the associations between screen time (young people's engagement with screen-based technologies), green time (young people's contact with nature), and psychological outcomes (including mental health, cognitive functioning, and academic achievement) in children and adolescents ages 5- to 18-years-old. *link*	
Key Findings	• "(I)n general, high levels of screen time appeared to be associated with unfavorable psychological outcomes while green time appeared to be associated with favorable psychological outcomes" (p.1). • Different developmental stages appeared to shape which exposures and outcomes were salient. • High screentime and low green time may affect lower socioeconomic youth disproportionately. • Preliminary evidence revealed that green time could buffer consequences of high screen time.
Key Quotes	• *"Nature may currently be an under-utilized public health resource, and it could potentially function as an upstream preventative and psychological well-being promotion intervention for children and adolescents in a high-tech era* [emphasis added]*" (p.39).* • "ST and GT appear to be associated with psychological outcomes in contrasting ways; ST is mostly associated with unfavorable psychological outcomes, while GT is mostly associated with favorable psychological outcomes. *The combination of high ST and low GT observed in contemporary children and adolescents may be particularly harmful to their psychological well-being* [emphasis added]**"** (p.3). • "Studies looking at associations between ST (screen time) or GT (green time) and psychological outcomes in early adolescents (12-14 years)...where statistically significant associations were reported, ST exposures were generally associated with unfavorable psychological outcomes…while GT exposures were typically associated with favorable psychological outcomes (n = 8 studies)" (p. 17). • "Among older adolescents (15-18)...the results of studies demonstrating an association between ST exposures and psychological outcomes primarily suggest that high levels of ST are associated with poorer mental health across a range of exposures and outcomes…Outdoor programs, camp experiences, and wilderness expeditions were investigated in this age group. While largely unrelated to most psychological outcomes, these GT experiences were found to increase self-efficacy and positive identity, and decrease long-term total difficulties and anxiety" (p. 22)

Further Reading

This section offers a small selection of topical current reading from mass media. While not peer-reviewed research, these recent articles are written in accessible language and thus support an up-to-date overall understanding of the intersection of social media and child and adolescent wellbeing.

To note is the last title, a book: *The Anxious Generation*. It has just been published, and was written by Jonathan Haidt, a social psychologist and the Thomas Cooley Professor of Ethical Leadership at the New York University Stern School of Business. Haidt and his associates have started a movement to "reclaim childhood" using four norms: No smartphones before high school, phone-free schools, more free play in the real world, and no social media until 16. His claims rely on academic research, and he shares extensive resources to access this research on his website. The book and website serve as all purpose guides to social media and child and adolescent mental health and wellbeing. Readers can find out more here: anxiousgeneration.com.

Mass Media Publications:

1. Facebook Executives Shut Down Efforts to Make the Site Less Divisive (WSJ, May 2020).
2. Google U.S. Lobbying Jumps 27% as Lawmakers Aim to Rein in Big Tech (Reuters, January 2022).
3. Social Media Could Pose 'Profound Risk of Harm' to Young People's Mental Health, Surgeon General Warns (WSJ, May 2023).
4. AI is about to Make Social Media (Much) More Toxic (The Atlantic, May 2023).
5. TikTok Ramps Up Lobbying in Washington to Try to Avoid U.S. Ban (WSJ, March 2023).
6. ENCORE: Smartphones, Social Media and Poor Mental Health (Canadian Medical Association Journal Podcasts, December 2023).
7. Suing Social Media: Families Say Social Media Algorithms Put Their Kids in Danger (60 minutes, June 2023).
8. 'Your product is killing people': Tech Leaders Denounced Over Child Safety (NYT, January 2024).
9. Why Eating Disorder Content Keeps Spreading (NYT, February 2024).
10. The Rise of Techno-Authoritarianism (The Atlantic, January 2024).
11. The Anxious Generation: How the Great Rewiring of Childhood Is Causing an Epidemic of Mental Illness (Penguin Press, 2024).