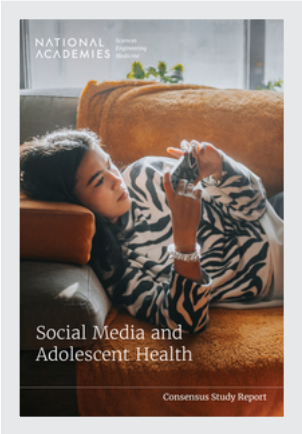

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The Relation between Social Media and Health

At the center of any discussion of social media and adolescent health is a growing body of research attempting to measure the associations and disentangle the many, sometimes conflicting, often reciprocal, mechanisms through which the online experience and physical or mental health can influence each other. This chapter reviews recent evidence linking social media to various outcomes, most of them threats to health and wellbeing.

There are several reasons why these links between social media and health are complex. First of all, the direction of the relation is difficult to determine, as social media may influence a health outcome, and that health outcome may in turn influence subsequent social media use. There is also a lack of uniformity in research approaches. Some factors are conceptualized as a dependent variable in some studies and as an independent variable in others.[1] Third, it is difficult to study a relation between an outcome and exposure when the exposure is ubiquitous. The bias introduced by omitted variables make it difficult to say to what extent a young person's health problems are the cause or the effect of social media use or of another, unmeasured cause. Fourth, different levels of analysis

[1] A characteristic such as self-esteem, for example, could be influenced by social media use; a pathway some research has explored (Vogel et al., 2014). Other studies have considered how a tendency to social comparison, related to self-esteem, influences the way a person uses social media and feels about this use (Vogel et al., 2015). Still other studies aim to establish only that the use of social media and self-esteem are related (Saiphoo et al., 2020; Woods and Scott, 2016).

can sometimes reveal different dynamics that are difficult to resolve, such as large-scale studies showing health trends at the population level but psychological-level studies showing small or mixed effects. Another reason for the complexity in the relationship between social media use and health, as made clear in Chapters 2 and 3, is that social media use is not monolithic. The affordances of different social media platforms allow for a broad range of behaviors that can have dramatically different psychological and health implications. For example, using social media to connect with distant family members might be good for health, while using social media to stalk a former partner is more likely bad. Both behaviors take place on social media, and might even take the same amount of time, but the experience is different. Also, it is important to note that there are a host of proposed mechanisms that may underlie the association between social media and health, rather than a single dominant mechanism, and these mechanisms are likely not independent of one another and may also be contradictory (e.g., fostering inclusion online but displacing face-to-face interaction with family). Finally, considerable heterogeneity emerging in the literature, suggesting that the relationship between social media and health likely differs substantially among individuals, makes it difficult to make conclusions that are not highly qualified or particular to certain subgroups.

THE COMMITTEE'S APPROACH TO THE EVIDENCE REVIEW

In considering the evidence linking social media to adolescent health,[2] the committee looked at indicators of both physical health (e.g., sleep, exercise, diet) and mental or behavioral health (e.g., depression and anxiety), as well as outcomes involving salient psychological experiences (e.g., social comparison). The literature presented in this chapter is weighted toward the potential harms of social media use for adolescents' mental health, a reflection of the scientific literature. This chapter also reflects that more research has been done on mental and behavioral outcomes than on physical ones, with the exception of sleep disruptions. The committee also recognizes that physical and mental health influence each other. Sleep loss, for example, can be a cause or an effect of depression, or both; the two are often related. Moreover, the position of this committee as expressed in Chapter 1 is that mental health is health because health is more than simply the absence of disease.

There is a longstanding historical literature that social connect has physical health effects on biomarkers of disease, chronic disease, and

[2] The committee acknowledges that some pathways that have not been explicitly studied in children may still influence their health and this chapter cites some studies on older participants, usually undergraduates.

disease-related mortality (HHS, 2023a; Holt-Lunstad, 2018, 2022; Yang et al., 2016). The long-term risk or protective value of social media to influence the same is far less well-studied, a serious limitation of the research.

Inferring Causation

Most research on the relation between social media and health is cross-sectional, and the preponderance of cross-sectional research has in turn informed a number of systematic reviews and meta-analyses (see Appendix C). It is difficult to establish a cause and effect relationship on the basis of such evidence. One meta-analysis of over 200 papers published between 2006 and 2018 found small associations between social media use and anxiety and depression; it also found small associations between social media use and social connectedness, a positive outcome (Hancock et al., 2022b). A 2020 meta-analysis fewer studies found no strong association between social networking and various measures of well-being (Appel et al., 2020); other researchers found a weak association between use of social networking and depressive symptoms (Cunningham et al., 2021). A 2016 meta-analysis found small to moderate associations between social networking use and measures of social capital (Liu et al., 2016). Other meta-analyses have suggested that the small associations may be influenced by the choice of mental health indicators (Meier and Reinecke, 2020; Yin et al., 2019).

One criterion to establish a causal relationship between an outcome and exposure is that the exposure happens before the outcome. Given the ubiquity of social media in the lives of adolescents over the last few decades, few studies are able to do this; fewer still have followed participants over a long period of time. Longitudinal designs can provide valuable insight into patterns in outcomes over time. While longitudinal research cannot in itself establish a causal relationship, such studies can help control for several types of bias introduced by individual characteristics (Vander Wyst et al., 2019). Longitudinal studies that can control for baseline variation, as with the randomized allocation of different exposures, provide even stronger evidence for causality (Toh and Hernán, 2008), but are extremely rare in the study of social media.

The committee recognizes that studies showing that a social media exposure preceded changes in mental health or well-being are not necessarily evidence that social media caused the changes. Especially in mental health epidemiology: the true onset of psychological problems can be difficult to ascertain even in clinical settings. Consider the example of teenager learning of their parents' divorce and immediately turning to social media for solace or distraction. The psychological fallout of processing the divorce may take many months longer to manifest, confounding the causal inference.

A final challenge is that mental health outcomes have complicated roots and are difficult to measure. There is wide variability in the methods and rigor seen in publications about social media and mental health, making it difficult to synthesize their findings (Ivie et al., 2020; Keles et al., 2020). This leaves the observer with a good amount of literature to inform theories and pique hypotheses as to how social media might be effecting young people, but with far less certitude that can, with confidence, lead to dispositive conclusions.

The committee's review of the literature presented in this chapter and Appendix C did not support the conclusion that social media causes changes in adolescent health at the population level. This chapter summarizes the evidence the committee considered on the association between young people's social media use and various measures of behavioral, mental, and physical health. It is not a systematic review; rather, this chapter presents the committee's analysis of key trends and findings in the field. In the interest of timeliness and as a reflection of the rapid pace of technological change, the analysis is weighted to relatively recent publications, primarily including literature published in the last five years (January 2018 through May 2023), along with some references published before 2018, particularly those identified in systematic reviews. Additionally, the committee conducted hand searches for landmark publications with no limits on publication date. A table of key systematic reviews and meta-analyses can be found in Appendix C.

The timing of the papers reviewed overlaps significantly with the COVID-19 pandemic. Regardless of whether researchers were explicitly studying the influence of school closures and lockdowns on social media use, the importance of this context for the questions of interest is notable. During the pandemic, adolescents used social media more frequently, both for continued communication with friends and family and for schoolwork (Bozzola et al., 2022). Social media was also one of few sources of entertainment during lockdown (Anderson et al., 2022).

HEALTH EFFECTS

Concerns about the possible health effects of media on children and adolescents have existed as long as the media have (Bandura et al., 1963; NIMH, 1982; U.S. Surgeon General, 1972). Research on the effects of social media is more recent, and as yet mostly limited to studies establishing an association between the media exposure and an outcome. Social media include a variety of affordances that are used in different ways by different people, who vary in age, developmental capacity, and susceptibilities. Further, most research is designed to assess whether social media use and various outcomes are related, not whether the media use causes the outcome in question.

It is important to note that a great deal of this research uses between-group comparisons, such as the comparison between young people who use different platforms or have different amounts of use. Far fewer studies have looked at within-person changes related to using or not using social media. There may also be important variability in how young people of different demographic characteristics use social media that could influence their well-being. A large UK study found that the power of social media to influence well-being depended on developmental stage, with girls between ages 11 and 13 and boys between ages 14 and 15 to be in particularly sensitive window (Orben et al., 2022). Too often research groups adolescents broadly or uses convenient age cutoffs rather than grounding analyses in developmental stages or accounting for the influential timing of puberty.

Because of the profound extent of their physical, neurobiological, social, emotional, and cognitive development, adolescents may be uniquely vulnerable to health effects related to social media use (Crone and Konijn, 2018; HHS, 2023b). This chapter highlights some key evidence of this pattern and notes, when possible, the developmental features that may be behind adolescents' unique susceptibility. The analysis will include factors thought to influence health outcomes (e.g. social comparison, displacement) as well as specific health outcomes (e.g. anxiety, problematic use).

Social Comparison

Comparing oneself to others is a normal part of adolescents' identity development and can elicit both good and bad feelings. Research has found that youth using social media frequently engage in comparisons of themselves to others online, and some research suggests that social comparisons might mediate the relationship between social media use and negative affect (Fardouly and Vartanian, 2016; Nesi and Prinstein, 2015). A 2017 experiment in which high schoolers browsed Instagram found that those who engaged in higher levels of negative social comparison had significantly worse post-browsing feelings compared with peers with less negative social comparison; they were also the most helped by an intervention to reduce negative social comparisons (Weinstein, 2017).

Cross-sectional and survey research among undergraduates has found that comparisons of popularity, happiness, and likeability are part of social media use (Lee, 2014; Wang et al., 2017; Wirtz et al., 2021). Adolescents may be relatively more affected by social comparisons, however (Weinstein, 2017, 2018). Some evidence suggests that young users compare themselves to others and use that information to further explore their own identity (Noon, 2020). It is possible that lateral and downward social

comparisons can be supportive of teens' well-being. For example, adolescents' comparisons to youth who are similar to them may contribute to benign envy (rather than malicious envy) and serve to inspire youth (Noon and Meier, 2019). Relatedly, passive social media use and upward comparisons have been found to be positively associated with materialism among adolescents [3] (Hu and Liu, 2020). A considerable amount of social media and social comparison research has focused on body image and attractiveness (discussed later in this chapter), rather than constructs such as happiness and popularity.

Social comparisons seem to be more common among younger adolescents than older teens and adults, although experimental research has not focused as closely on this age range. A systematic review of mostly cross-sectional research on problematic social media use (loosely defined as use that causes dysfunction in daily life and offline activities) among adolescents and psychiatric disorders highlighted a series of studies that found negative social comparisons around body image to be related to depressive symptoms, especially among girls. In this study, this was not found to be related to time on social media, but rather to social comparisons (Cataldo et al., 2020). These comparisons may be worst when the subject of the comparison is a celebrity or an acquaintance, and less so for close friends and family (Scully et al., 2023).

The problems related to social comparison are thought to be worse for teens who engage in so-called upward comparisons, viewing other people better off in some way—happier, more popular, or more attractive than themselves (de Vries et al., 2018). Longitudinal research looking at the effect of social media within a person (i.e., the same person over time) found no overall association between social media use and life satisfaction (Boer et al., 2021). A Dutch study assessing social media use and self-esteem 6 times a day over 3 weeks found no within-person relationship between social media and self-esteem, giving more support to the idea that ones' s susceptibility the helpful or harmful influence of social media varies widely among individuals (Valkenburg et al., 2021). Individual styles of using social media may account for some of the difference. A repeat-measure, cross-sectional study of younger adolescents (aged 10 to 14 years) found that social media use characterized by viewing and responding to other people's posts rather than sharing about oneself was associated with a lower self-esteem regarding appearance in girls (Steinsbekk et al., 2021).

Some research suggests that certain youth might be more at risk for making negative social comparisons and for feeling badly as a result. In

[3] Passive social media use refers to monitoring other people and scrolling through their information without directly engaging. Active social media use, in contrast, refers to messaging friends and broadcasting information about oneself (Valkenburg et al., 2021).

a study of 8th and 9th graders, researchers found that young people who were rated as low in popularity by their peers were more likely to engage in social comparison and report more depressive symptoms afterwards (Nesi and Prinstein, 2015). The user's inclination to social comparison online is related in turn to self-esteem – with girls being more susceptible to negative comparisons (Cingel et al., 2022). Survey research among young (mostly undergraduate), Black women suggests that social media comparison to an idealized archetypes (in this case "the Strong Black Woman") is associated with lower self-esteem, though the direction of the association is not possible to determine (Stanton et al., 2017). (That is, it may be that women who are struggling in other ways endorse ideals of Black womanhood as a coping strategy, or the exposure to this ideal raises feelings of inadequacy in otherwise healthy women.) A systematic review of studies involving youth under 19 suggested that low self-esteem and social comparison may account for the relationship between problematic social media use and depression (Cataldo et al., 2020).

Family dynamics may also play a role in youth's social comparisons on social media and subsequent feelings of sadness. Parents' monitoring of social media, their communication with their children, and baseline family conflict could be background factors that influence young people's mental state and attitude toward social media. A study of children between 10 and 12 years old found that more parental control was related to less social media use and less frequent social comparisons when browsing, which in turn predicted better mental health (Fardouly et al., 2018).

Body Image, Body Satisfaction, and Disordered Eating

There is long-standing concern that exposure to unrealistic images of female beauty in the media, not only social media, can drive feelings of body dissatisfaction, especially in girls and women (Botta, 1999; Stice and Shaw, 1994). The prevalence of the thin-ideal images on social media has been cited as a cause of both clinical eating disorders and problems such as depression and anxiety (Fitzsimmons-Craft et al., 2020). Nevertheless, it is difficult to disentangle the causal factors in this relationship.

To start, the psychological factors that influence the development of eating disorders including anxiety, depression, and obsessive-compulsive behaviors, can also manifest in disordered behaviors such as overuse of social media (Barakat et al., 2023; Yurtdaş-Depboylu et al., 2022). It is also true that someone suffering from disordered or ruminative thinking about food and diet may use social media to seek out information about thinness and dietary restriction. The potential for algorithmic feedback to promote disordered eating to people who are already at high risk raises heightened

concern. Research among teens in treatment for eating disorders found that the patients who spent the most time on TikTok do so despite a concern that social media is harmful to their health and self-esteem (Pruccoli et al., 2022). The same platform that helps some patients find recovery support was, for others, a source of body shaming and rumination (Pruccoli et al., 2022).

Social comparison may play a role in teens' body image and body satisfaction. At the same time, clinical eating disorders are exceedingly rare,[4] so the population-level effects of social media to encourage them is not easily quantified. Research among young women finds little effect of viewing fitness and thinness influencers on perceptions of one's own body image (Cohen and Blaszczynski, 2015; Fardouly et al., 2015; Haferkamp and Kramer, 2011; Tiggemann and Zaccardo, 2015). Yet the photo-sharing emphasis of some social media platforms, coupled with some users' high investment in self-image, has been proposed as a risk for eating disorders (Saul et al., 2022).

A cross-sectional study of middle schoolers, for example, found that youth who had more body dissatisfaction engaged with social media more and reported more online social anxiety, depressive symptoms, and difficulty with offline relationships (Charmaraman et al., 2021). In focus groups, girls of the same age have acknowledged using social media for comparison, although the harms were greatly mitigated by factors such as baseline media literacy, supportive relationships with parents, and a nurturing school environment (Burnette et al., 2017). Similar research on the correlation between social media use and body dissatisfaction among teens found the association was weaker for those who reported positive relationships with their mothers, suggesting that some home and environmental factors might be protective (de Vries et al., 2019).

The type of behavior young people engage in on social media may contribute to disordered eating. Soliciting other users' ratings of one's appearance is, unsurprisingly, associated with shame and the constant monitoring of appearance, especially among girls (Salomon and Brown, 2018).

The risk of social media to aggravate body image problems may also be a function of advertising. Advertisements for cosmetics and beauty products are some of the most commonly shown to teenagers (Slater et al., 2012). At the same time, labelling of altered or enhanced advertising images, mandatory in some countries, does not appear to reduce the com-

[4] The National Institute of Mental Health estimates the population lifetime prevalence of anorexia nervosa as 0.6 percent (0.9 percent in females, 0.3 percent in males); the point prevalence of bulimia nervosa was 0.3 percent (0.5 percent in females, 0.1 percent in males) (NIMH, 2023).

parisons or negative feelings associated with viewing them (Tiggemann, 2022).

There is little research explicitly examining the effect of social media use and body image and related issues among male, transgender, or nonbinary teens. Most studies in the field look at the association between social media use and body image among cisgender female users (Rodgers and Rousseau, 2022).

Displacement

One of the main ways social media use affects health is by taking up time that would otherwise have been spent differently. The displacement of time otherwise given to sleep, exercise, or hobbies can have consequences for health (Twenge et al., 2018). If time spent on social media replaces time spent sleeping or leads to withdrawal from friends and hobbies the displacement seems to predict depression and anxiety (Hökby et al., 2016). For example, a recent systematic review found social media use to be associated with consumption of fast food, sugary drinks, and a diet of unhealthy snacks, possibly because of displacement of regular meals or encouragement of mindless eating (Sina et al., 2022). Social media can also displace less healthy activities. For adolescents in emotionally volatile homes, interacting on social media may provide a welcome respite from listening to family members argue; engaging in a gamified fitness challenge could displace sedentary screen time. Nevertheless, most literature on displacement looks at its relatively straightforward effects on sleep or physical activity.

Considerable observational and cross-sectional research links the use of screen media to less sleep, later bedtimes, poor quality sleep, and daytimes sleepiness in young people (Carter et al., 2016; Hale et al., 2019). A systematic review of only high- and moderate quality studies (8 longitudinal and 35 cross-sectional designs) found consistent associations between digital media use and delayed sleep, daytime sleepiness, sleep duration and quality, and sleep deficient among young people aged 16 to 25 (Brautsch et al., 2023). The same review found that computer, internet, and social media use were associated with shorter duration and poorer quality sleep, though the same association was not evident for television, game console, or tablet use (Brautsch et al., 2023). A high level of mental stimulation time lost to social media (compared with more passive activities) may account for the reduced quality of sleep (Alonzo et al., 2021). The consequences of sleep loss are revisited later in this chapter.

Increasing use of digital technology, including social media, is also associated with a sedentary lifestyle, which can pose health risks for anyone, but especially for children (Oh et al., 2022). A nationally repre-

sentative, cross-sectional study of over 40,000 students in 8th, 10th, and 12th grades in the United States found that regular social media use was associated with extremes of health behaviors (Shimoga et al., 2019). That is, among physically active teens frequent social media use was associated with high levels of physical activity, while frequent social media use was associated with sedentary behavior among the least active teens (Shimoga et al., 2019). Similarly, poor sleepers who used social media frequently had a greater disruption to their sleep than adequate sleepers who use social media to the same extent (Shimoga et al., 2019). It may be that young people merely extend their existing personality and behaviors into their social media use, with users of moderate intensity having better well-being than their peers who use social media heavily or not at all.

Chapter 8 of this report explains why raw screen time is not generally a useful research variable, although studies of displacement may be an exception to that rule. Entertainment screen time displaces time spent in sleep and exercise and is a risk factor for clinically problematic use (Gentile et al., 2017b; Lua et al., 2023). Having screen media in children's bedrooms, for example, is associated with increased time spent on media, which in turn statistically predicted poorer school performance, greater risk for obesity, and a greater risk for gaming disorder (Gentile et al., 2017b).

Yet the extent to which social media use displaces unambiguously healthy pastimes such as sport and sleep appears to vary across socioeconomic background. The amount of sleep adolescents get each night has been in decline since the 1990s, with teens from minority racial and ethnic groups and of lower socioeconomic status the most likely to be in sleep deficit (Keyes et al., 2015). Teens and young adults from lower-income households and from some minoritized ethnic groups have been shown to experience a higher burden of sleep disruption related to social media use than their White or more affluent peers (Levenson et al., 2017). The same trends are even more pronounced in relation to measures of overweight: a problem that has been increasing in the United States since at least the 1980s and is disproportionately found among children of lower-income and less educated parents (Ogden et al., 2018; Ogden et al., 2010). Combined with evidence that young people from the highest income families tend to limit their use of social media, there is reason to suspect that social and economic factors confound many of risks attributed to social media use (Micheli, 2016).

Attention and Learning

Humans learn from whatever they pay attention to, and adolescents are no different. Learning occurs through several mechanisms (Gentile and Gentile, 2021). Not only can the content consumed via social media

be learned, but so can ways of processing information. Because social media can be consumed in small amounts of time and are often used while multitasking (i.e., looking at social media feeds while also doing something else, such as homework, having a conversation, or watching TV), this could have an effect on attention, which in turn, can influence learning and school performance.

The distracting power of social media may work through the attentional vigilance elicited by social media notifications, likes, or messages, especially among adolescents who may be more sensitive to these features. Adolescence is an important developmental window for the cultivation of attentional control, a skill necessary for academic success and socioemotional adjustment (Rueda et al., 2010; Siebers et al., 2022). Social media prompts users to continual connectivity, which can make it more difficult to stay on task and concentrate (Dontre, 2021). Partly for this reason, social media use is thought to reduce adolescents' ability to sustain attention and suppress distraction, key components of concentration. Some evidence supports this theory. A study using repeated measures multiple times a day over 21 days found that social media use was associated with distraction among 7th and 8th graders despite the participants' reports of feeling little distraction on average (Siebers et al., 2022). A recent network analysis in the UK found time spent on social media predicted concentration problems in adolescent girls (though time spent on social media was not an influential predictor of other mental health problems) (Panayiotou et al., 2023).

At the same time, it is difficult to say that the distraction posed by social media is a function of the media. Reading on screens is fundamentally distracting, as it is difficult to separate the act of reading from other notices and incitements to multitask (Liu, 2022). Switching between tasks poses serious cognitive demands (Dontre, 2021), which are likely magnified for adolescents. Research among undergraduates, presumably at least somewhat motivated students, found that in 3 hours of studying students encounter an average of 35 distractions that divert their attention for a total of 25 minutes (Calderwood et al., 2014). That said, an experiment banning laptops from undergraduate classrooms found no benefit, even a possible detriment to learning (as students in the no-laptop group simply did not come to class) (Elliott-Dorans, 2018). A 2018 meta-analysis found mobile phone use in the classroom to modestly interfere with student learning and academic performance, although this small effect was driven more by undergraduates than K through 12 students (Kates et al., 2018).

One meta-analysis found associations between media multitasking and problems with attention regulation (e.g., increased mind wandering and distractibility), behavior regulation (e.g., emotion regulation and self-monitoring), inhibition or impulsiveness (e.g., higher level of impul-

siveness and lower level of inhibition), and memory (Wiradhany and Koerts, 2021). Effect sizes were small ($z = 0.16$ to 0.22) but significant for each of the four aspects measured. Another meta-analysis found a small but statistically significant associations between media multitasking and problems with cognitive control, ability to sustain attention, and working memory (Parry and le Roux, 2021).

There is also evidence that screen media use in general is associated with attention problems, such as attention-deficit/hyperactivity disorder (ADHD). Longitudinal studies have found the amount of media use can predict ADHD symptoms, although it is likely a reciprocal relationship (Gentile et al., 2012; Swing et al., 2010). Similarly small associations have been recorded between media use and ADHD-related behaviors such as inability to focus, hyperactivity, and impulsivity (Beyens et al., 2018; Nikkelen et al., 2014).

Family and Media Use

Family practices, especially parents' decisions regarding media use, likely influence the extent to which social media affects teenagers' mental health and well-being. Parental rules, communication, and the monitoring of media have been conceptualized in a variety of ways. Many parents use messaging apps and social media to connect with their children throughout the day, and research using intensive daily monitoring of teens' phones found that Black and Hispanic teens had more digital contact with their parents than White teens, and daughters had more frequent contact than sons (Jensen et al., 2021). Using social media to stay connected to children may improve parent–child communication and afford parents' greater involvement in their children's lives (Dworkin et al., 2018; Rudi and Dworkin, 2018). Yet given the mainly cross-sectional study designs in this field, it is difficult to disentangle whether parents' rules are an influence on their children's social media use or a reaction to their children's experiences online.

A recent meta-analysis on the role of parents to reduce the harm of social media found that parents' co-using and actively guiding their children's media was associated with a small but helpful effect to reduce the risk of problematic use and inappropriate behavior online, although more for children than older adolescents (Chen and Shi, 2019). Parents' imposition of restrictions on media use was associated with less time spent online, though mostly for younger children (Chen and Shi, 2019). A similar meta-analysis found that the same coviewing and active guidance parenting strategies to be related to less aggression in response to viewing violent media and improved concentration and less problematic use of TikTok (Collier et al., 2016; Qin et al., 2023). A large survey of Spanish

teens found that parents' restrictions on online media use were associated with lower digital literacy and poorer understanding of online risks in their children (Rodríguez-de-Dios et al., 2018).

In guiding their children's and teens' media use, parents need to consider their children's increasing maturity and give progressively more independence with age. It is likely that restrictions on media use are useful for young children, while increased communication and awareness are more suitable and helpful for teenagers (Gabrielli and Tanski, 2020; Young and Tully, 2022). More restrictive rules around social media, when communicated in a way that recognizes and supports the adolescent's increasing independence, has been shown to be effective in decreasing the aggression associated with violent media viewing (Fikkers et al., 2017). Survey data has found associations between parents' restrictive and controlling use of technology, such as confiscating an adolescent's phone for punishment, with young people's taking more risks online, as in interacting with strangers, while a more open and communicative style about rules and expectations online was associated with fewer risks (Young and Tully, 2022).

There is some indication that family structures and the quality of parent–child relationships influence how teens use social media and the risks and benefits of that use. On average, adolescents from single parent households use more digital technology and also may experience more problematic media use than their peers in two-parent households (Bloemen and De Coninck, 2020; Ko et al., 2015; Mei et al., 2016). Adolescents who are among the highest users of social media tend to come from families characterized by greater conflict and lower perceived support (Vannucci and McCauley Ohannessian, 2019). Some researchers have suggested that problems with parent–child attachment may be a pathway to compulsive social media use in later life (D'Arienzo et al., 2019). Open communication between parents and teens appears to be key to optimal social media use (Padilla-Walker et al., 2011; Reid Chassiakos et al., 2016).

Feelings of Sadness, Anxiety, Depression, and Stress

Feelings of sadness, anxiety, depression, and stress are some of the most frequently studied outcomes related to social media use. Studies across adolescent samples in the United States and other countries do not find a consistent pattern (e.g., Bezinovic et al., 2015; Hoare et al., 2017; Kircaburun, 2016; Kreski et al., 2021; Wartberg et al., 2020; Zhang et al., 2019). The larger sample sizes and increased statistical power associated with meta-analysis generally find small and inconsistent effects. This might be due to variability in measures of social media use, that is, the lumping together of different platforms or different types of use, or of

using relatively crude proxies such as screen time. Variability in the uses of social media is another explanation, with demographic, neurological, and developmental differences all possibly influencing the results. In one meta-analysis, the most often replicated finding was that the small portion of youth who engage in very high, problematic levels of media use tend to also experience more depressive symptoms (Shannon et al., 2022).

Studies looking at the association between social media use and feelings of sadness over time have largely found small to no effects. An eight-year longitudinal study of a nationally representative sample found no association between time using media and self-reported feelings of sadness (Coyne et al., 2020). A shorter-term study using more precise time measurement, asking youth throughout their day about their mood and every evening about their smartphone activities, found no association between device use and mental health (Jensen et al., 2019).

Any study that asks participants to recall their mood or their behavior is vulnerable to bias, especially if the behaviors recalled are relatively mundane and forgettable. A technique called ecological momentary assessment aims to reduce such bias by sampling participants at random times and supporting these brief assessments with electronic records or psychological sensors (Shiffman et al., 2008). A study using this technique found that girls aged 11 to 13 experienced more lingering emotional pain from negative interactions with friends on social media than from the negative interactions offline (Hamilton et al., 2021). In general, ecological momentary assessment studies have found limited to weak evidence of the association between mental health and media use (Houghton et al., 2018; Jensen et al., 2019; Sewall et al., 2021).

A 2020 meta-analysis including studies on 11- to 18-year-olds found a small association between social media use and symptoms of depression, but the authors cautioned against overinterpreting this result given the heterogeneity in the studies reviewed and overall small effect size (Ivie et al., 2020). A similar review, this one including both adults and adolescents, found an association between depression and time spent on social media, frequency of checking social media, and engaging in upward social comparisons, though the effects ranged from small to medium and varied widely among studies (Yoon et al., 2019).

Another recent meta-analysis of cross-sectional and longitudinal studies of social media (mainly Facebook) and wellbeing found a very small but positive relation between social media and depression, with a modestly stronger, though not statistically significant, relationship seen in college-age samples than in younger adolescents (Hancock et al., 2022a). A similarly small but not statistically significant relationship has been observed between social media use over time and rates of depression and suicide (Orben and Przybylski, 2019; Twenge, 2020).

Several meta-analyses and systematic reviews have used raw screen time as an exposure variable (Li et al., 2022; Liu et al., 2022; Santos et al., 2023; Tang et al., 2021). Such results are difficult to interpret as screen time as an umbrella category can encompass widely varying exposures. For example, a recent meta-analysis pooled estimates of time on social media and depression from cross-sectional and longitudinal studies and found a linear relationship between risk of depression and time spent on social media, with risk of depression increasing an estimated 13 percent with every additional hour of exposure, with the pattern being more pronounced in girls than boys (Liu et al., 2022). At the same time, the authors cautioned against using observational studies to support any causal claims, as the studies included were vulnerable to bias, with depressed participants being more likely to report higher social media use (Liu et al., 2022).

A longitudinal study of younger adolescents (aged 11 to 14 years) found that not just time but the number and variety of platforms used were predictive of later feelings of sadness, with high social media use associated with worse mental health, especially when using more platforms (Vannucci and McCauley Ohannessian, 2019). A 2021 meta-analysis found time and intensity of social media use to be associated with depressive symptoms for adults and for youth but measurement aspects, such as whether participants were recruited through social networking sites or other spaces, influenced effect estimates with the estimate of the effect being stronger in studies that recruited through the platforms (Cunningham et al., 2021).

Clinical Samples

Young people with clinically meaningful depression are an important population to consider in understanding the risks of social media. Elias and Gorey's scoping review of social media use among patients with clinical or bipolar depression found their perceptions of social media use to be twice as related to positive and protective effects than negative ones (Elias and Gorey, 2022). Others have found baseline levels of depression to predict media use more than media use predicting depression (Heffer et al., 2019). A small body of research suggests that depressed users may engage with social media differently than the general population; machine learning tools can identify depressed mood in social media posts (Ghosh and Anwar, 2021; Zogan et al., 2022). A narrative review of self-harm and social media found that self-injurious and suicidal young people use social media to seek out support from others like themselves but are also likely to seek out and be exposed to self-harm content, which they may then come to see as normal (Memon et al., 2018).

Patterns of Use

Some research suggests that the relationship between social media use and feelings of sadness might be circular. In a sample of Chinese undergraduates, passive social media use predicted depressive symptoms and depressive symptoms predicted passive social media use (Wang et al., 2018). Similar patterns seem to apply to adolescents. Passive browsing on Instagram has been shown to be related to depressive symptoms in 11- to 19-year-olds (Frison and Eggermont, 2016). Adolescents with higher depressive symptoms tend to spend more time on screens, and social media use among adolescents may predict depression risk over time (Houghton et al., 2018; Raudsepp and Kais, 2019).

Other researchers have proposed that the type of social media use is the principal feature that determines its relative harmfulness (Valkenburg et al., 2021). A review of longitudinal studies found that passive social media use is associated with low life satisfaction and feeling of sadness, though the relationship between active use and life satisfaction is less clear (Course-Choi and Hammond, 2021). In a sample of youth with mild to severe depressive symptoms, Nereim and colleagues (2022) used ecological momentary assessment to determine that, on average, active social media use was related to better mood and passive use to worse mood, but these patterns of results varied by race and ethnicity (differences discussed in the next section). Similarly, a review of the quality of social media use and depressive symptoms among teens and adults found that negative quality social media use (referring to use that is likely to undermine one's psychological well-being such as use characterized by bullying or envy) was related to depressive feelings, and these findings did not differ between adults and teenagers (Vahedi and Zannella, 2021).

Differences Among Youth

The connection between social media use and adolescent depressive symptoms might vary among different demographic or identity groups. A systematic review mostly qualitative and cross-sectional research on this connection among LGBTQ+ teens found that social media use was associated with fewer depressive symptoms but more risk of discrimination (Berger et al., 2022). Although systematic reviews of racial and ethnic differences in the association between social media and adolescent health have not yet been published, research suggests differences exist. For example, using within-person comparisons among young people with mild to severe depressive symptoms, Black, non-Hispanic participants reported more negative mood during active social media use and White, non-Hispanic youth reported less positive mood during passive social

media use (Nereim et al., 2022). Like LGBTQ+ adolescents, adolescents of color are also more at risk for exposure to discrimination and bias online which can result in increased depressive symptoms and even post-traumatic stress disorder symptoms (Tynes et al., 2019). In general, there are both benefits and harms involved with social media use for sexual and gender minorities and for teenagers of color.

Some studies have shown that the association between social media use and measures of depression and anxiety is similar for male and female adolescents; others have seen the association only among girls (Keles et al., 2020). Other investigators have suggested that passive social media use may predict more problems in female teens and active use in male teens (Frison and Eggermont, 2017). Socioeconomic status is less studied, although family income is related to both mental health and adolescents' access to and use of social media (Odgers and Robb, 2020). Young people from the lowest income brackets are more likely to have online experiences spill into their in-person world, as with online arguments becoming conflicts at school (Odgers, 2018). There are socioeconomic dimensions to whether a young person has a device or reliable internet access with which to use social media in the first place (Odgers and Robb, 2020). There is also some evidence that the relationship between social media use and some outcomes varies by household income. Among 10- to 14-year-old participants in the Adolescent Brain Cognitive Development (ABCD) study, higher household income was associated with more problematic video game use for Black adolescents, but not White ones (Nagata et al., 2022).

Consequences of Exposure to Pornography

While not a feature of social media use per se, social media can be an avenue of exposure to online pornography. A Common Sense Media survey of more than 1,300 13- to 17-year-olds found that almost three-quarters of teens had seen pornography online, with social media being the point of access for about 18 percent of respondents (Robb and Mann, 2023). Accidental exposure to pornography, through clicking on an ad or link, accounted for 40 percent of reported exposure, with the average age of first exposure being 12 years (Robb and Mann, 2023). About half of teens surveyed reported viewing pornography with violent themes such as rape, choking, and infliction of pain (Robb and Mann, 2023).

Survey data indicate distress, shock, and disgust are common reactions to unwanted pornography viewing among children and teens (Flood, 2009). It is not easy to say what the longer-term effects of this exposure may be. Sexualized exposure to women may increase acceptance of gender stereotypes (Ward, 2003). Pornography can also influence ado-

lescents' reference points for normal sexual behavior, normalizing aggressive behavior in dating and sexual experiences (Flood, 2009; Rodenhizer and Edwards, 2019; Wright, 2014). Repeated exposure to inappropriate sexual content in childhood is associated with risky sexual behavior in later life; there is some evidence that repeated exposure to pornography in adolescence is associated with a skewed understanding of healthy sexual relationships (Bozzola et al., 2022; Maurer and Taylor, 2020).

Sleep

There are three main ways in which digital media use can disrupt sleep quality and duration (LeBourgeois et al., 2017). First, media use can displace sleep by delaying bedtimes, disrupting sleep through notifications, and reducing sleep duration by waking earlier to check phones (Hale et al., 2019; LeBourgeois et al., 2017). Second, devices can disrupt circadian rhythms through their light emissions which can heighten arousal, decrease sleepiness at night, and reduce melatonin production (Chang et al., 2015; LeBourgeois et al., 2017). Third, media use can be psychologically stimulating in which interactions with others, fear of missing out, and viewed content can affect mood in ways that make sleep difficult (Cain and Gradisar, 2010; LeBourgeois et al., 2017).

A review of video game use and sleep found gaming predicted delayed bedtimes and reduced attention the following day (Peracchia and Curcio, 2018). Use of smartphones and other media devices at night has been shown to delay sleep among adolescents and young adults (Chang et al., 2015; Figueiro and Overington, 2015; Orzech et al., 2016). In focus groups, teenagers reported a need to check and respond to messages to be a large contributor to insufficient sleep, delayed bedtime, and daytime tiredness (Scott et al., 2019). Research among undergraduates that relied on logging software to record use of phones and computers found that sleep can also influence social media use, with sleep-deprived participants showing worse mood, more social media use, and problems with concentration (Mark et al., 2016).

Sleep is important for everyone's physical and mental health, especially so for adolescents given their rapid physical and cognitive growth (NHLBI, 2022). Adolescents need between 8 and 10 hours of sleep for every waking day to support the changes brought about by puberty, growth of long bones, and neurological development (Paruthi et al., 2016). A serious consequence in its own right, sleep loss is also a risk factor for depression, mood disturbances, injuries, attention problems, and excessive weight gain (Lowry et al., 2012; Owens and Weiss, 2017; Paruthi et al., 2016). A nationally-representative, cross-sectional study found that only slightly more than a third of parents of teenagers aged 12 to 17 had

rules about smartphone use at bedtime, but adolescents whose parents had such rules had far less experience of daytime sleepiness (Hamilton and Lee, 2021).

Daytime sleepiness is far from the only consequence of sleep loss in teens. In an experimental setting, when adolescent participants were allocated to have 10 hours a night in bed for sleep or a sleep schedule restricted to 6.5 hours a night (representing only roughly 30 minutes shorter than U.S. teens' sleep on average [Nationwide Children's, 2023], teens with restricted sleep were seen to have more problems with emotional regulation, feelings of anxiety, hostility, and fatigue (Baum et al., 2014). Analysis of the Centers for Disease Prevention and Control's Youth Risk Behavior Surveys suggest that relative to young people who sleep 8 hours a night, those who sleep 4 or fewer hours a night have 5.9 times higher odds of having a serious suicide attempt (95 percent confidence interval 2.8 to 12.6); those who slept more than 10 hours a night had 4.8 times increased odds of having a serious suicide attempt (95 percent confidence interval 1.3 to 17.1) (Fitzgerald et al., 2011).

Given importance of sleep for emotional regulation and concentration in adolescents, its relation to mental health problems is powerful on its own. The evidence linking social media to sleep loss is therefore concerning and may be the most plausible mechanism through which social media could be harmful.

Internet Gaming Disorder

There is a considerable body of research suggesting that some heavy users of online video games develop dysfunctional symptoms. There is good consensus that internet gaming disorder, the "persistent and recurrent use of the internet to engage in games, often with other players, leading to clinically significant impairment or distress" is a problem deserving of further study; it was added to the fifth edition of *Diagnostic and Statistical Manual of Mental Disorders* (APA, 2013, p. 795). The body of research accumulating since 2013 led to gaming disorder (also commonly known as "video game addiction" or "gaming addiction") being included in the *International Classification of Diseases*, 11th revision (ICD-11) as a disorder caused by addictive behavior (WHO, 2019). The *ICD-11* description emphasizes that the disorder must be a persistent pattern over which the gamer has impaired control to the point that gaming takes precedence over other interests and daily activities. The gaming behavior must escalate despite causing problems for the gamer such as interpersonal conflict, poor grades, and deteriorating health. The behavior must also be apparent over an extended time, not accounted for by any other mental disorder nor related to use of any substance or medicine, and the source of distress

or impairment in some aspects of life functioning (WHO, 2019).In short, both definitions emphasize the power of technology to disrupt healthy functioning, not how much time is spent with the technology, though it would be unusual if dysfunctional use were not also lengthy.

Estimates of the prevalence of internet gaming disorder vary depending on sample characteristics and measurement techniques, and range from about 1 percent to 10 percent of users (Gentile et al., 2017a). Meta analyses of internet gaming disorder estimate a prevalence among adolescents from 4.6 percent to 8.8 percent with male adolescents being affected the most (Fam, 2018; Gao et al., 2022; Stevens et al., 2021). Internet gaming disorder effects adolescent males five times more often than adolescent females (Fam, 2018).

Given that gaming disorder is defined by dysfunction, it is not surprising that many studies find evidence that it statistically predicts depression, anxiety, social phobia, poor school performance, sleep disruption, and poor relationships with parents and peers (Ahmed et al., 2022; Gentile et al., 2009; Gentile et al., 2011; Mannikko et al., 2020; Ostinelli et al., 2021; Teng et al., 2020). Acknowledging that most young people who play video games do not become addicted to them, it is important nevertheless to recognize that a nontrivial percentage do. Without treatment, the consequences on health and social functioning for these young people can be serious.

Problematic Social Media Use

Social media use can also be considered problematic when it causes dysfunction in daily life activities such as in-person activities, schooling, and sleep (Caplan, 2010; Casale and Banchi, 2020). While problematic social media use is not yet classified as a disorder, it is associated with other mental health problems. A meta-analysis of international studies found that problematic social media use, mainly use of Facebook, was associated with worse mental health, especially depression, although this analysis was heavily weighted to adult samples (Huang, 2022). What is more, problematic social media use, like internet gaming disorder, is often associated with disruptions in sleep, mood, and functioning that could have independent effects on mental health (Bányai et al., 2017; Paakkari et al., 2021; Pontes, 2017).

There is no consistent estimate of the extent to which problematic social media use predicts other mental problems. Multiple studies have found problematic level of social media use to be associated with poor mental health, loneliness, and suicidality (Bányai et al., 2017; Marino et al., 2018; O'Day and Heimberg, 2021; Sedgwick et al., 2019). Other studies have shown that problematic social media use earlier in adolescence

(ages 10 to 16) predicted depression and lower life satisfaction a year later (Boer et al., 2022).

It is currently unclear whether problematic social media use and gaming disorder are distinct disorders or are simply different manifestations of a similar disordered use of technology. A 2-year longitudinal study of risk factors for gaming disorder and a more general internet use disorder, found more similarities than differences in risk factors (Kim et al., 2022). Cross-sectional research has found similar overlap in risk factors for internet gaming disorder, problematic social media use, and the more general problematic internet use (Moreno et al., 2022).

At the time of this report, only gaming disorder has been officially recognized as a mental health disorder by the World Health Organization. There is some suggestion that males are more likely to become addicted to gaming whereas females are more likely to become addicted to social media (Leonhardt and Overå, 2021). One meta-analysis of 140,000 people in over 20 countries demonstrated this basic finding, but also noted that the gender-correlated difference appears larger when focusing on social media specifically rather than more general internet addiction (Su et al., 2020). Nonetheless, the body of research demonstrating that a subset of social media users and gamers experience substantial dysfunction is growing rapidly (King et al., 2013).

Virtual Reality

While not a form of social media per say, virtual reality can be a feature of various video games and social media platforms. Still a relatively new feature of social media, the literature on the effects virtual reality on health is scant. These affordances are accessed through virtual reality headsets, can create a psychologically and physiologically immersive experience mimicking the real world in ways that children cannot necessarily identify as symbolic or not real, though few studies have explored the effects of virtual reality in participants younger than 18 (Bailey and Bailenson, 2017).

Virtual reality headsets can put considerable strain on the eyes (Hirzle et al., 2022). Headache, nausea, and upset stomach are also common side effects of using virtual reality (Zhang, 2020). For this reason, some guidance has suggested restricting the length of time in children can use virtual reality to 10 or 30 minutes and to be especially mindful of restrictions in children with a history of eye problems (Bailenson, 2023; Yamada-Rice et al., 2017).

On the other hand, virtual reality technology has promise as a teaching tool, especially for immersing students in experiences that would otherwise be dangerous, impossible, or counterproductive (Bailenson,

2023). Skills for which the practice involves risk of injury, including rough sports such as football, may be well suited to virtual training models, as are simulations of behaviors that could not be done in real life because their consequences are too severe (e.g., the conservation lessons learned from a simulated experience of cutting down a tree) or too expensive (e.g., snorkeling on a coral reef) (Bailenson, 2023). The technology can be useful to imitate experiences of living in a different body, which may cultivate empathy, as in the immersive 1,000 Cut Journey experience meant to help people understand the cumulative toll of racism (Cogburn et al., 2018).

Virtual reality programs offer promising options to support adolescent health, particularly for the provision of clinical mental health services and stress management programs (Björling et al., 2022; Hugh-Jones et al., 2023). A systematic review of virtual reality in hospitals found that the technology had a distracting power, which could be a useful tool to reduce pain and anxiety in young people (Ridout et al., 2021). At the same time, the newness of the technology and its known physical risks prevent any widespread endorsement of virtual reality other than for clearly targeted uses of short duration.

Engaging and Practicing Health-Promoting Behavior

Social media could potentially influence health by providing young people with trustworthy sources of health information. At the same time, a recent systematic review found that adolescents' consumption of health information on social media may be as much about building community and connectedness as building health knowledge (Freeman et al., 2023). As with teens' attitudes towards political comments on social media, adolescents use considerable discretion in identifying suitable health topics to share about on social media, their decisions being heavily influenced by social norms in their peer group (Freeman et al., 2023). Possibly because of distrust of the platforms or from compartmentalizing, many teens appear disinclined to follow health-related social media pages or post about health to their profiles (Leary et al., 2019). That said, the internet more broadly is a useful tool to learn about health. A survey of teenage boys found that almost half use social media sites to find out about mental health topics that they would never ask another person about (Best et al., 2014).

The reach and scale of social media platforms means they can be harnessed for health education and behavior change and may be useful to reach vulnerable young people and promote health equity (Hunter et al., 2019; Welch et al., 2016).

There is modest evidence that social media can be used to improve diet and nutrition as well as knowledge of how to prevent HIV and other

sexually transmissible infections among teens (Hsu et al., 2018; Wadham et al., 2019). Some interventions are targeted at important subpopulations, such as pregnant teenagers, for whom social media has been used with some success to improve nutrition knowledge and diet (Vander Wyst et al., 2019).

Social media can also be a powerful tool for targeted health promotion, including messages about mental health and suicide prevention (Latha et al., 2020). Digital tools can be used to help bring mental health help to people who might not otherwise access it (Bucci et al., 2019). The same monitoring has been successful for teens with asthma (Panzera et al., 2013). Qualitative research has found that by serving as a vehicle to promote lived experience, social media can inspire more intentional seeking of health information among LGBTQ+ teens (Hsu et al., 2018).

There is also a world of socially connected apps that can be used for health promotion, including menstrual cycle, diet, and exercise tracking apps. These apps might make a game of exercise among friends, for example, and could be appealing to teens (Ludwig and Galluzzi, 2018). A 2016 study found that 29 percent of teens who had a smartphone had downloaded some health-related apps (Wartella et al., 2016). These could be useful for health promotion, as when paired with appropriate counselling (Singh et al., 2014). However, menstrual cycle tracking apps, for example, could be misleading to young users given their predictions of fertile and infertile windows (Fowler et al., 2020). As with any app that collects sensitive health information, data privacy, a topic discussed more in the next chapter, is a heightened concern.

GUIDELINES AND RECOMMENDATIONS FROM OTHER AUTHORITATIVE BODIES

As this chapter has made clear, the scientific literature on the health effects of social media use is mixed and inconclusive. At the same time, there is consistent demand for syntheses of this literature, which several authoritative bodies have provided. Table 4-1 summarizes recent guidance on adolescents and social media use from the American Academy of Pediatrics, American Psychological Association, and the U.S. Surgeon General. In general, these groups have given professional practice guidelines and advice on "roles, patient populations, or practice settings based on current research and professional consensus," (APA, 2021, p. 4). These should not be mistaken for clinical practice guidelines that are developed for clinicians and depend on a fairly high standard of evidence (IOM, 2011).

Table 4-1 reflects broad consensus on several points related to young people's use of social media. All three documents, like this report, empha-

TABLE 4-1 Authoritative Bodies' Guidance on Social and Digital Media Use and Adolescents

Publication	Target Audience*	Guidance or Recommendations
Media Use in School-Aged Children and Adolescent[5]a	Pediatricians	• Work with families and schools to promote understanding of the benefits and risks of media • Promote adherence to guidelines for adequate physical activity and sleep via a family media use plan • Advocate for and promote information and training in media literacy • Be aware of tools to screen for sexting, cyberbullying, problematic Internet use, and internet gaming disorder
	Families	• Develop, consistently follow, and routinely revisit a family media use plan: ○ Address what type of, and how much, media are used and what media behaviors are appropriate for each child or teenager, and for parents; place consistent limits on hours per day of media use as well as types of media used ○ Promote that children and adolescents get the recommended amount of daily physical activity (1 hour) and adequate sleep (8–12 hours, depending on age) ○ Recommend that children not sleep with devices in their bedrooms, including TVs, computers, and smartphones; avoid exposure to devices or screens for 1 hour before bedtime ○ Discourage entertainment media while doing homework ○ Designate media-free times together (e.g., family dinner) and media-free locations (e.g., bedrooms) in homes; promote activities that are likely to facilitate development and health, including positive parenting activities, such as reading, teaching, talking, and playing together ○ Communicate guidelines to other caregivers, such as babysitters or grandparents, so that media rules are followed consistently • Engage in selecting and coviewing media with your child, through which your child can use media to learn and be creative, and share these experiences with your family and your community

		• Have ongoing communication with children about online citizenship and safety, including treating others with respect online and offline, avoiding cyberbullying and sexting, being wary of online solicitation, and avoiding communications that can compromise personal privacy ad safety. • Actively develop a network of trusted adults (e.g., aunts, uncles, coaches) who can engage with children through social media and to whom children can turn when they encounter challenges
	Researchers, governmental organizations, and industry	• Continue research into the risks and benefits of media: o Prioritize longitudinal and robust study designs, including new methodologies for understanding media exposure and use o Prioritize interventions including reducing harmful media use and preventing and addressing harmful media experiences • Inform educators and legislators about research findings so they can develop updated guidelines for safe and productive media use
Health Advisory on Social Media Use in Adolescence[b]	Not always specified, but implied to be: parents, social media companies, adolescents, clinicians, teachers, policy makers, and research funders.	• Youth using social media should be encouraged to use functions that create opportunities for social support, online companionship, and emotional intimacy that can promote healthy socialization • Social media use, functionality, and permissions/consenting should be tailored to youths' developmental capabilities; designs created for adults may not be appropriate for children • In early adolescence (i.e., typically 10–14 years), adult monitoring (i.e., ongoing review, discussion, and coaching around social media content) is advised for most youths' social media use; autonomy may increase gradually as kids age and if they gain digital literacy skills; however, monitoring should be balanced with youths' appropriate needs for privacy • To reduce the risks of psychological harm, adolescents' exposure to content on social media that depicts illegal or psychologically maladaptive behavior, including content that instructs or encourages youth to engage in health-risk behaviors, such as self-harm (e.g., cutting, suicide), harm to others, or those that encourage eating disordered behavior (e.g., restrictive eating, purging, excessive exercise) should be minimized, reported, and removed; moreover, technology should not drive users to this content

(*continued*)

TABLE 4-1 Continued

Publication	Target Audience*	Guidance or Recommendations
		• To minimize psychological harm, adolescents' exposure to "cyberhate" including online discrimination, prejudice, hate, or cyberbullying, especially directed toward a marginalized group (e.g., racial, ethnic, gender, sexual, religious, ability status) or toward an individual because of their identity or allyship with a marginalized group, should be minimized • Adolescents should be routinely screened for signs of "problematic social media use" that can impair their ability to engage in daily roles and routines and that may present a risk for more serious psychological harms over time • The use of social media should be limited so as to not interfere with adolescents' sleep and physical activity • Adolescents should limit use of social media for social comparison, particularly around beauty-related or appearance-related content • Adolescents' social media use should be preceded by training in social media literacy to ensure that users have developed psychologically informed competencies and skills that will maximize the chances for balanced, safe, and meaningful use of social media. • Substantial resources should be provided for continued scientific examination of the positive and negative effects of social media on adolescent development

Surgeon General's Advisory on Social Media and Youth Mental Health[c]	Policy makers	• Strengthen protections to ensure greater safety for children interacting with all social media platforms, in collaboration with governments, academic organizations, public health experts, and technology companies:
		  ○ Develop age-appropriate safety standards for technology platforms
		  ○ Require a higher standard of data privacy for children
		  ○ Pursue policies that further limit access in ways that minimize the risk of harm for all children, including strengthening and enforcing age minimums
		• Ensure technology companies share data relevant to the health effect of their platforms with independent researchers and the public in a manner that is timely, sufficiently detailed, and protects privacy
		• Support the development, implementation, and evaluation of digital and media literacy curricula in schools and within academic standards
		• Support increased funding for future research

	• Engage with international partners working to protect children and adolescents against online harm to their health and safety
Technology industry	• Conduct and facilitate transparent and independent assessments of the impact of social media products and services on children and adolescents; assume responsibility for the impact of products on different subgroups and ages of children and adolescents, regardless of the intent behind them: Be transparent and share assessment findings and underlying data with independent researchers and the public in a manner that protects privacy Assess the potential risks of online interactions, and take active steps to prevent potential misuse. Establish scientific advisory committees to inform approaches and policies • Prioritize user health and safety in the design and development of social media products and services: Ensure default settings for children are set to highest safety and privacy standards Adhere to, and enforce, age minimums • Design, develop, and evaluate platforms, products, and tools that foster safe and healthy online environments for youth • Share data relevant to the health impact of platforms and strategies employed to ensure safety and wellbeing with independent researchers and the public in a manner that is timely and protects privacy • Create effective and timely systems and processes to adjudicate requests and complaints from young people, families, educators, and others to address online abuse, harmful content and interactions, and other threats to children's health and safety

(*continued*)

TABLE 4-1 Continued

Publication	Target Audience*	Guidance or Recommendations
	Parents	• Create a family media plan • Create tech-free zones, and encourage children to foster in-person friendships. Since electronics can be a potential distraction after bedtime and can interfere with sleep, consider restricting the use of phones, tablets, and computers for at least 1 hour before bedtime and through the night. Consider keeping family mealtimes and in-person gatherings device-free to build social bonds and engage in a two-way conversation. Help your child develop social skills and nurture his or her in-person relationships by encouraging unstructured and offline connections with others and making unplugged interactions a daily priority. • Model responsible social media behavior. As children often learn behaviors and habits from what they see around them, try to model the behavior you want to see. • Teach kids about technology and empower them to be responsible online participants at the appropriate age. Discuss with children the benefits and risks of social media as well as the importance of respecting privacy and protecting personal information in age-appropriate ways. • Report cyberbullying and online abuse and exploitation. Talk to your child about their reporting options, and provide support, without judgment, if he or she tells or shows you that they (a) are being harassed through email, text message, online games, or social media or (b) have been contacted by an adult seeking private images or asking them to perform intimate or sexual acts. You or your child can report cyberbullying to the school and/or the online platform, or your local law enforcement. • Work with other parents to help establish shared norms and practices and to support programs and policies around healthy social media use.
	Children and Adolescents	• Reach out for help. If you or someone you know is being negatively affected by social media reach out to a trusted friend or adult for help. • Create boundaries to help balance online and offline activities. • Develop protective strategies and healthy practices such as tracking the amount of time you spend online, blocking unwanted contacts and content, learning about and using available privacy and safety settings, learning and utilizing digital media literacy skills to help tell the difference between fact and opinion, and ensuring you are connecting with peers in-person.

- Be cautious about what you share. Personal information about you has value. Be selective with what you post and share online and with whom, as it is often public and can be stored permanently.
- Protect yourself and others. Harassment that happens in email, text messaging, direct messaging, online games, or on social media is harmful and can be cyberbullying:
  - Don't keep online harassment or abuse a secret.
  - Don't take part in online harassment or abuse.

Researchers

- Establish the impact of social media on youth mental health as a research priority and develop a shared research agenda. Research should include but not be limited to:
  - Rigorous evaluation of social media's impact on youth mental health and well-being, including longitudinal and experimental studies.
  - Role of age, developmental stage, cohort processes, and the in-person environment in influencing the onset and progression of poor mental health outcomes among social media users.
  - Benefits and risks associated with specific social media designs, features, and content.
  - Long-term effects on adults of social media use during childhood and adolescence.
- Develop and establish standardized definitions and measures for social media and mental health outcomes that are regularly evaluated and can be applied across basic research, population surveillance, intervention evaluation, and other contexts.
- Evaluate best practices for healthy social media use in collaboration with experts including healthcare providers, parents, and youth.
- Enhance research coordination and collaboration.

NOTE: Unless otherwise noted, audiences are specifically identified in guidance documents.
SOURCES: [a] AAP et al., 2016a; [b] APA, 2023; [c] = HHS, 2023b.

size the importance of digital media literacy to empower young people to protect their personal information, be responsible in their social media participation, and be vigilant about the harms of cyberbullying and abuse. There is also a common consideration for balance, making time for sleep, in-person interaction, and physical activity. As in this report, all the guidance documents emphasize the pressing need for research, including both independent evaluation of social media products and longitudinal and experimental designs to better understand social media's influence on development. The documents also share a concern with helping parents who may feel deeply ambivalent about their children's use of social media.

The committee sympathizes with some parents' desire for authoritative prescriptions on teenagers' social media use but is also mindful of overreaching the data. Social media is a relatively new tool, and it is already clear that this tool can be used for good or ill, the relative balance of good and bad depends on the user. There is also a wide diversity of experience and maturity among adolescents; this diversity introduces considerable room for judgement and context to the discussion. While experts can say with confidence that respect for the child's privacy and autonomy should increase with age, there is no clear age cutoff for use of any particular social media affordance. Tolerance for ambiguity and sensitivity to individual needs are defining features of parenting adolescents. Parenting their use of social media is no exception.

Such ambiguity is perhaps most clear in a comparison of the American Academy of Pediatrics recommendations on media use for children under 5 years and to its recommendations for school-aged children and adolescents. In its guidance for preschoolers and toddlers, the academy gives hard limits, expressed in hours per day, on the amount of time young children should use screen media; it is equally clear about an age below which screen media is not appropriate (AAP et al., 2016b). Such guidance is scientifically credible, building off decades of research on children's television, a body of work that is largely transferable to other media as young children do not generally interact with social affordances online. The academy's companion publication for children aged 5 to 18, issued in the same year, is far less proscriptive. Its recommendations, summarized in Table 4-1, encourage a use of social media that is planned and intentional, open communication between parents and children, and the fostering of a network of trusted adults outside of the household to whom a child could turn when facing challenges online.

Parents struggling to put guardrails on their teenage children's social media use would do well to remember that social media can bring young people joy and foster a sense of community. This community may be especially valuable to members of minority identity groups or to anyone with niche or unusual interests that can be fostered online. At the same time, social media can be a venue for harassing behavior and exposure to fringe ideas, though evidence suggests that support from parents can mitigate these problems (Hébert et al., 2016; Samara et al., 2021). The committee concurs with the American Academy of Pediatrics and American Psychological Association's emphasis on ongoing discussion between parents and children as to how they use social media, looking for opportunities to talk about risks such as oversharing, harassment, or forming skewed perceptions. The threat of social media to displace other activities, especially sleep, also warrants vigilance from parents. Parents can also cultivate awareness of their children's baseline emotional and behavioral state so to be attuned to any changes in it. Heightened intensity of emotions, disengagement from friends, schoolwork, or hobbies, could all be related to risky or problematic use of social media (as they are to other health and interpersonal problems) (Aboujaoude, 2010; Kuss and Lopez-Fernandez, 2016).

In short, managing social media in adolescence, like many of the challenges of growing up, is eased by supportive and loving families. At the same time, the line between supportive parents and responsible, productive use of social media is not particularly clear or direct. Overstating this relationship or venturing hard and fast rules regarding teenagers' use of social media, rules that the data cannot support, is not something this committee can do. For this reason, the following chapters discuss steps that could create a more transparent industry and a better-informed consumer of social media. Box 4-1 summarizes some of this report's main messages for parents.

BOX 4-1
Notes for Parents

The balance of benefits and harms young people experience on social media is likely to vary widely and may give some parents cause for concern. While the data do not support a clear proscription on social media use among adolescents this report offers some guidance for parents weighing the pros and cons of social media for their teenage children.

- There is a wide diversity of maturity and circumstances among adolescents; this diversity introduces considerable room for judgement into parents' estimations of whether or how often their teenage children should use social media.
- Respect for young people's privacy and autonomy should gradually increase with age, but there is no clear age cutoff for the use of any particular social media affordance.
- An ongoing, open discussion between parents and children regarding social media use is crucial, especially when the conversation turns to the risks of oversharing, harassment, or the forming of skewed perceptions.
- Parents do well to stay attuned to their children's baseline emotional and behavioral states and monitor any changes in them. Heightened intensity of emotions and changes in behavior can be warning signs of interpersonal problems including problematic social media use and gaming addiction.
- An objective quality benchmark could be invaluable to parents who are struggling to discern various platforms' commitments to young people's privacy and safety online. Efforts to promulgate industry standards will, in the long term, be useful to parents as will investments in educating young people in digital media literacy.

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