

AMENDED Exhibit 301

PLAINTIFFS' OMNIBUS OPPOSITION TO DEFENDANTS' MOTIONS FOR SUMMARY JUDGMENT

Case No.: 4:22-md-03047-YGR

MDL No. 3047

In Re: Social Media Adolescent Addiction/Personal Injury Products Liability Litigation

TEEN WELL-BEING AND SOCIAL MEDIA:

OVERVIEW BRIEFING

The concerns around teen well-being and social media are only new on the surface. Parents have always worried about teenagers and how they spend their time, especially around the introduction of new information technologies. These new technologies have often been accompanied by panics, such as books being called “confusing and harmful” as early as the 16th century (x). Given the speed of mass adoption of the smartphone, there is logically a fear around teens' use of these devices, and of social media. Adding in the recent increases in teen mental health problems creates a perfect storm. However, there is strong reason to believe these incidents are not related to one another. Rather, research has found that there is heightened awareness of depression and that the condition had been long under-diagnosed in previous decades (x). Similarly, overall increases in anxiety disorders may be due to the inclusion of mild forms of anxiety as clinically diagnosed disorders (x).

That said, there is still a significant and important debate about the role of technology in general and social media specifically on teens. The memo below outlines what is known from academic literature (first section) as well as what we have learned from our internal research (second section).

Social media and teen well-being

In recent years, there has been criticism around social media's negative impact on teen well-being. One of the most prominent critics in this area is Jean Twenge, who received popular attention for her book “iGen: Why Today's Super-Connected Kids Are Growing Up Less Rebellious, More Tolerant, Less Happy—and Completely Unprepared for Adulthood –and What That Means for the Rest of Us” as well as her The Atlantic article “Have Smartphones destroyed a generation?” Twenge claims that increases in depression and youth suicide, lower academic achievement and political engagement, antisocial behavior and increased loneliness are the result of teens using smartphones and social media. Her arguments have been debunked both in the popular press (x, x, x) and in academia (x, x) for presenting a simplistic narrative for a complex phenomenon, presenting correlation as causation, cherry-picking confirmatory evidence for her claims, and misleadingly presenting trends. For a full rebuttal of Twenge's claims, please see [here](#). Many of the long-term trends observed are linked to socio-cultural shifts in the US over the past 40 years, such as “pressures on the education system, growing social inequality, racial and ethnic tensions, labour market instability, growing precarity, student debt, drugs policy, political disaffection, the undermining of health and welfare provision” (x).

However, some aspects of teen well-being (life satisfaction, loneliness, depression, anxiety) have recently seen a reversal of long-term positive trends and warrant further attention. According to the most robust research studies to date, these downturns are not caused by social media or digital technologies. For example, a re-analysis of Twenge's data on depressive symptoms and teens concludes that social media accounts for little of the rise in depressive symptoms and that “the findings point to a need for alternative explanations (e.g. increased academic strain, prolonged effects of the Great Recession)” (x). Further, a re-examination of Twenge's claims of social media causing anxiety among teens showed her claims to be unsubstantiated (finding that the cited research studied adults and found completely different results than she had claimed) (x).

Instead of fear-based research and reporting, experts call for (a) taking cultural and social factors into account for population-level analysis for a holistic perspective (x) and (b) taking an individual approach and understanding that not everyone is affected the same. For example, teens who are vulnerable 'offline' are more vulnerable 'online' – e.g. teens from lower SES backgrounds are at greater risk for negative consequences of their time spent online (x).

Yet, to date there are few representative studies on youth well-being and social media, and none that explicitly compare youth to adult well-being as it relates to social media (for a comprehensive literature review for adults' relationship between social media and well-being, see [here](#)). The largest scale research to date claims that the association between digital technology use and adolescent well-being is negative but small, explaining at most 0.4%

of the variation in well-being and does not warrant policy changes (x). To illustrate the small effect size, one author states that eating potatoes has the same negative effect as social media on adolescent well-being (x). The evidence indicates that moderate use of digital technology is not intrinsically harmful and may be advantageous (x). In addition, meta-reviews of existing research show mixed findings (positive / negative / non-significant) about the association between depression and anxiety and social media use (x, x). Another meta-review of 36 studies shows that teens are more adept than adults at integrating digital technologies into their everyday lives and use social media to enhance their friendships (x).

Digital technology use is considered beneficial to children's social relationships (x) and social media use in particular seems to be linked to better cognitive development, refuting earlier assumption that brain development in children is negatively impacted by social media (x,x). For children, "the most robust studies suggest that the relationship is U-shaped, where no use and excessive use can have a small negative impact on mental well-being, while moderate use can have a small positive impact" (x).

In summary, the body of research suggests that the relationship between teens' social media use and their well-being does not fit an "either/or" framework. Social media experiences can be positive or negative depending on the individual: Social media experiences can be organized across 4 dimensions that can result in both positive and negative effects: "*Relational interactions* contribute to both closeness and disconnection; *self-expression* facilitates affirmation alongside concern about others' judgments; interest-driven *exploration* confers inspiration and distress; and *browsing* leads to entertainment and boredom, as well as admiration and envy" (x).

Social media and teen mental health

The most common arguments concerning the relationship between social media and teens' well-being revolve around teens becoming more anxious and more depressed because of their social media use. This directional relationship is unsupported by existing research. In fact, there is increasing evidence that the directionality goes the other way – teens with mental health problems turn to social media for help and improvement (x). That said, when social media use displaces sleep in adolescents (via nighttime social media use), it is negatively correlated to indicators of mental health (x).

DEPRESSION. A recent nationally representative survey among US youth found that there is no correlation between reported frequency of social media use and reported depressive symptoms among teens and young adults (x). This survey did not find statistically significant association between depressive symptoms and how teens report using social media (i.e. "active" or "passive" behaviors on social media). Teens with depressive symptoms have HEIGHTENED experiences on social media, both more positive AND more negative. Teens and young adults with depressive symptoms are slightly more likely to say that using social media during these periods makes them feel better (30%) than they are to say it makes them feel worse (22%). For young people with moderate to severe depressive symptoms, social media may be more important than for youth without depressive symptoms when it comes to feeling less alone, finding inspiration, and providing a venue for creative self-expression. Adolescents with depressive symptoms report both positive and negative effects of social media use (x). Positive practices include searching for positive content (i.e. for entertainment, humor, content creation) or for social connection. Negative practices include sharing risky behaviors, cyberbullying and for making self-denigrating comparisons with others.

ANXIETY. The directionality of the relationship between anxiety and social media use is unclear. Teens who report higher emotional investment in social media also display higher levels of anxiety (x). There is evidence to suggest that the relationship is such that more socially anxious teens tend to use social media more to communicate about personal and intimate topics. They "were motivated to use online communication significantly more frequently to compensate for their weaker social skills to meet new people. Results suggest that Internet usage allows them to fulfill critical needs of social interactions, self-disclosure, and identity exploration" (x). Teens with anxiety are at risk of developing FOMO with social media use (x). FOMO is associated with lower need satisfaction, mood and life satisfaction (x). Our internal research shows that teens (13-17) worldwide reported feeling less lonely than most other

age groups, especially young adults (18-24), and were more likely to say Facebook helped them feel less lonely. Teens also rated their interactions on FB as more meaningful than any other age group (x). External research has found that when Instagram is increasing closeness between friends, it is related to lower levels of anxiety/depression (x). The number of social media platforms used could be positively correlated to teens' feelings of FOMO (x). A similar linear relationship is shown for young adults (x). A possible explanation for this relationship is that each platform comes with their own set of social rules and etiquettes that users have to learn: "an individual who uses only one or two platforms may easily learn these idiosyncrasies and succeed at leveraging that platform for positive social capital and positive interaction. However, as the number of platforms used increases, individuals may experience difficulty navigating these multiple different worlds successfully, leading to potentially negative mood and emotions. Moreover, a third possible reason for use of multiple platforms leading to depressive or anxiety symptoms may involve an increased risk of damaging gaffes." (x).

Summaries of selected external research

- Baker, D. A., & Algorta, G. P. (2016). [The relationship between online social networking and depression: a systematic review of quantitative studies](#). This systematic review of empirical studies (n = 30) adds to existing research in this field by examining current quantitative studies focused on the relationship between online social networking and symptoms of depression. The findings suggest that the relationship between online social networking and symptoms of depression may be complex and associated with multiple psychological, social, behavioral, and individual factors. Furthermore, the impact of online social networking on wellbeing may be both positive and negative, highlighting the need for future research to determine the impact of candidate mediators and moderators underlying these heterogeneous outcomes across evolving networks
- Barry, C, Sidoti, C, Briggs S, Reiter, SR & Lindsey, RA (2017). [Adolescent social media use and mental health from adolescent and parent perspectives](#). Parent and adolescent reports of the number of adolescents' social media accounts were moderately correlated with parent-reported DSM-5 symptoms of inattention, hyperactivity/impulsivity, ODD, anxiety, and depressive symptoms, as well as adolescent-reported fear of missing out (FoMO) and loneliness. Lastly, anxiety and depressive symptoms were highest among adolescents with a relatively high number of parent-reported social media accounts and relatively high FoMO.
- Bonetti, L., Campbell, M. A., & Gilmore, L. (2010). [The relationship of loneliness and social anxiety with children's and adolescents' online communication](#). The aim of this study was to investigate differences in usage of online communication patterns between children and adolescents with and without self-reported loneliness and social anxiety. 626 students ages 10 to 16 years completed a survey on the amount of time they spent communicating online, the topics they discussed, the partners they engaged with, and their purposes for communicating over the Internet. Findings revealed that children and adolescents who self-reported being lonely communicated online significantly more frequently about personal and intimate topics than did those who did not self-report being lonely. The former were motivated to use online communication significantly more frequently to compensate for their weaker social skills to meet new people. Results suggest that Internet usage allows them to fulfill critical needs of social interactions, self-disclosure, and identity exploration.
- Coyne, S. M., Padilla-Walker, L. M., Day, R. D., Harper, J., & Stockdale, L. (2014). [A friend request from dear old dad: Associations between parent-child social networking and adolescent outcomes](#). This study examined the relationship between parent-child social networking, connection, and outcomes for adolescents. Social networking with parents was associated with increased connection between parents and adolescents. Feelings of connection then mediated the relationship between social networking with parents and behavioral outcomes, including higher prosocial behavior and lower relational aggression and internalizing behavior. Conversely, adolescent social networking use *without* parents was associated with negative outcomes, such as increased relational aggression, internalizing behaviors, delinquency, and decreased feelings of connection. These results indicate that although high levels of social networking use may be problematic for some individuals, social networking with parents may potentially strengthen parent-child relationships and then lead to positive outcomes for adolescents.

- Daly, M. (2018). [Social media use may explain little of the recent rise in depressive symptoms among adolescent girls.](#)
- Glover, J., & Fritsch, S. L. (2018). [# KidsAnxiety and Social Media: A Review.](#) There is limited research guiding clinician's understanding of child or adolescent anxiety and the negative and positive impact social media may have for youth with anxiety. Socially anxious youth may find a social media presence helpful in developing relationships. Problematic Internet use in children and adolescents has significant impact on sleep, anxiety, and depression.
- Kardefelt-Winther, D. (2017). [How does the time children spend using digital technology impact their mental well-being, social relationships and physical activity? An evidence-focused literature review.](#) Based on an evidence-focused literature review, the first part of this paper examines existing knowledge on how the time children spend using digital technology impacts their well-being across three dimensions; mental/psychological, social and physical. The evidence reviewed here is largely inconclusive with respect to impact on children's physical activity, but indicates that digital technology seems to be beneficial for children's social relationships. In terms of impact on children's mental well-being, the most robust studies suggest that the relationship is U-shaped, where no use and excessive use can have a small negative impact on mental well-being, while moderate use can have a small positive impact. In the second part of the paper, the hypothetical idea of addiction to technology is introduced and scrutinized. This is followed by an overview of the hypothetical idea that digital technology might re-wire or hijack children's brains; an assumption that is challenged by recent neuroscience evidence. In conclusion, considerable methodological limitations exist across the spectrum of research on the impact of digital technology on child well-being, including the majority of the studies on time use reviewed here, and those studies concerned with clinical or brain impacts. This prompts reconsideration of how research in this area is conducted.
- Lee, S. J. (2009). [Online communication and adolescent social ties: Who benefits more from Internet use?](#)
- Livingstone, S. (2018). [Review: iGen: why today's super-connected kids are growing up less rebellious, more tolerant, less happy--and completely unprepared for adulthood.](#) There is a host of alternative explanations for the observed trends – for instance, concerning pressures on the education system, growing social inequality, racial and ethnic tensions, labour market instability, growing precarity, student debt, drugs policy, political disaffection, the undermining of health and welfare provision and more. The liveliest debate over the reception of the book centres on whether this is due to use of the smartphone or, perhaps, the cumulative effect of many adverse factors shaping children's lives, or, even, a greater openness to reporting mental health difficulties (and so, ultimately, a good thing, leading more to seek support rather than suffering in silence).
- McDool, E., Powell, P., Roberts, J., & Taylor, K. (2016). [Social media use and children's wellbeing.](#) Spending more time on social networks reduces the satisfaction that children feel with all aspects of their lives, except for their friendships; and that girls suffer more adverse effects than boys.
- Oberst, U., Wegmann, E., Stodt, B., Brand, M., & Chamarro, A. (2017). [Negative consequences from heavy social networking in adolescents: the mediating role of fear of missing out.](#) We analyze the role of fear of missing out (FOMO) and intensity of SNS use for explaining the link between psychopathological symptoms and negative consequences of SNS use. It was found that both FOMO and SNI mediate the link between psychopathology and CERM, but by different mechanisms. Additionally, for girls, feeling depressed seems to trigger higher SNS involvement. For boys, anxiety triggers higher SNS involvement.
- Odgers, C. L. (2018). [Smartphones are bad for some adolescents, not all.](#) Studies so far do not support fears that digital devices are driving the downfall of a generation. What online activities might be doing, however, is reflecting and even worsening existing vulnerabilities.
- Orben, A. & Przybylski, A. (2019). [The association between adolescent well-being and digital technology use.](#) The association between digital technology use and adolescent well-being is negative but small, explaining at most 0.4% of the variation in well-being. Taking the broader context of the data into account suggests that these effects are too small to warrant policy change.
- Primack, BA., Shensa, A., Escobar-Viera, CG., Barrett, EL., Sidani, E., Colditz, JB., James, E. (2017). [Use of multiple social media platforms and symptoms of depression and anxiety: A nationally-representative study among U.S. young adults.](#) Linear association between the number of platforms used and depression and between the

number of platforms used and anxiety. Associations remained strong after controlling for total time of social media use.

- Przybylski, A. K., & Weinstein, N. (2017). [A large-scale test of the goldilocks hypothesis: quantifying the relations between digital-screen use and the mental well-being of adolescents](#). Although the time adolescents spend with digital technologies has sparked widespread concerns that their use might be negatively associated with mental well-being, these potential deleterious influences have not been rigorously studied. Using a preregistered plan for analyzing data collected from a representative sample of English adolescents (n = 120,115), we obtained evidence that the links between digital-screen time and mental well-being are described by quadratic functions. Further, our results showed that these links vary as a function of when digital technologies are used (i.e., weekday vs. weekend), suggesting that a full understanding of the impact of these recreational activities will require examining their functionality among other daily pursuits. Overall, the evidence indicated that moderate use of digital technology is not intrinsically harmful and may be advantageous in a connected world. The findings inform recommendations for limiting adolescents' technology use and provide a template for conducting rigorous investigations into the relations between digital technology and children's and adolescents' health.
- Radovic, A., Gmelin, T., Stein, BD., Miller E. (2017). [Depressed adolescents' positive and negative use of social media](#). Adolescents with depression described both positive and negative use of social media. Positive use included searching for positive content (i.e. for entertainment, humor, content creation) or for social connection. Negative use included sharing risky behaviors, cyberbullying and for making self-denigrating comparisons with others.
- Rideout, V. & Fox, S. (2018). [Digital Health Practices, Social Media Use, and Mental Well-Being Among Teens and Young Adults in the U.S.](#) There is no correlation between reported frequency of social media use and reported depressive symptoms among teens and young adults. This survey does not find a statistically significant association between depressive symptoms and how teens report using social media (i.e. "active" or "passive" behaviors on social media). Teens with depressive symptoms have HEIGHTENED experiences on social media, both more positive AND more negative. Teens and young adults with moderate to severe depressive symptoms are more likely than other young people to say they have certain negative experiences on social media. Teens and young adults with depressive symptoms are slightly more likely to say that using social media during these periods makes them feel better (30%) than they are to say it makes them feel worse (22%). For young people with moderate to severe depressive symptoms, social media may be more important than for youth without depressive symptoms when it comes to feeling less alone, finding inspiration, and providing a venue for creative self-expression.
- Sampasa-Kanyinga, H., & Lewis, R. F. (2015). [Frequent use of social networking sites is associated with poor psychological functioning among children and adolescents](#). This study investigated the association between time spent on SNSs and unmet need for mental health support, poor self-rated mental health, and reports of psychological distress and suicidal ideation in a representative sample of middle and high school children in Ottawa, Canada. Students who reported unmet need for mental health support were more likely to report using SNSs for more than 2 hours every day than those with no identified unmet need for mental health support. Daily SNS use of more than 2 hours was also independently associated with poor self-rating of mental health and experiences of high levels of psychological distress and suicidal ideation. The findings suggest that students with poor mental health may be greater users of SNSs. These results indicate an opportunity to enhance the presence of health service providers on SNSs in order to provide support to youth.
- Seabrook, E. M., Kern, M. L., & Rickard, N. S. (2016). [Social networking sites, depression, and anxiety: a systematic review](#). The systematic review revealed many mixed findings between depression, anxiety, and SNS use. Positive interactions, social support, and social connectedness on SNSs were consistently related to lower levels of depression and anxiety, whereas negative interaction and social comparisons on SNSs were related to higher levels of depression and anxiety. SNS use related to less loneliness and greater self-esteem and life satisfaction. Findings were mixed for frequency of SNS use and number of SNS friends. Different patterns in the way individuals with depression and individuals with social anxiety engage with SNSs are beginning to emerge.
- Twenge, JM, Krizan, Z, & Hisler, G (2017). [Decreases in self-reported sleep duration among US adolescents 2009–2015 and association with new media screen time](#). Increased new media screen time may be involved in the

recent increases (from 35% to 41% and from 37% to 43%) in short sleep among adolescents.

- Vannucci, A., Flannery, K. M., & Ohannessian, C. M. (2017). [Social media use and anxiety in emerging adults](#). More time spent using social media was significantly associated with greater symptoms of dispositional anxiety ($B=0.74$, 95% CI=0.59–0.90, $p<0.001$), but was unrelated to recent anxiety-related impairment ($B=0.06$, 95% CI=0.00–0.12, $p=0.051$), controlling for age, gender, race/ethnicity, and education level.
- Weinstein, E. (2018). [The social media see-saw: Positive and negative influences on adolescents' affective well-being](#). Survey self-reports ($n = 568$) portray social media use as predominantly positive. In-depth qualitative work shows that experiences can be organized across four functional dimensions. *Relational interactions* contribute to both closeness and disconnection; *self-expression* facilitates affirmation alongside concern about others' judgments; interest-driven *exploration* confers inspiration and distress; and *browsing* leads to entertainment and boredom, as well as admiration and envy. All interviewees describe positive and negative affect experiences across multiple dimensions. Analyses suggest the relationship between social technology usage and well-being—whether enhanced or degraded—is not confined to an “either/or” framework: the emotional see-saw of social media use is weighted by both positive and negative influences.
- Woods, HC & Scott, H (2016). [# Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem](#). Relationship between social media and sleep quality: that poor sleep quality was most strongly associated with nighttime-specific social media use, while anxiety, depression and self-esteem were most strongly associated with emotional investment in social media. Only anxiety and depression significantly predict poorer sleep quality. Nighttime-specific social media use significantly predicted poorer sleep, whereas overall use did not. This suggests that social media behaviours around bedtime are more important in explaining the link between social media use and poor sleep than general behaviours throughout the day.

Summaries of selected internal research

INSTAGRAM RESEARCH & YOUTH WELL-BEING

Overall for teens, our internal research has not found a relationship between well-being on Instagram (IG) (how they felt while using Instagram) and TS on Instagram, although IG teens scored worse than IG adults on general well-being, negative affect (US, UK, BR), loneliness (US, UK, BR), and depression (only in US) (x).

- [SSI](#): People are building healthy support communities for SSI on IG. While some people want to help, they may: 1) not know how to help, and/or 2) lack the tools and resources they need to be effective supporters. We're focused on developing a deeper understanding of the people who are going through SSI, those who want to help them, and viewers who may be negatively impacted by SSI content. Understanding these groups will enable us to create products that truly speak to their needs.
- [Social Conflict](#): Teens weaponize IG features to torment each other, often without violating standards.
- [Social Comparison \(1, 2\)](#): 51% of people experience social comparison on IG (e.g., they compare their accomplishments to others or observe other people to decide how they should act “sometimes” or more often.). Women and teens are more prone to social comparison, especially negative social comparison.
- [Connections](#): We need more research to understand people's anxiety about which friends they are not connected to (or are not engaging with) on IG / social media.
- [Time Spent](#): Teens and younger adults have [more interest in receiving help to manage their time on Instagram](#) than adults.

FACEBOOK RESEARCH & YOUTH WELL-BEING

- **Well-being Levers for Teens on Social Media:** Mixed method study shows that close relationships, self-worth and meanings in life, and feeling positive are the most important well-being dimensions for teens. Social media activities that involve direct interactions with others have the largest effect on well-being. [2018]
- **How do Teens talk about Well-being and Social Media?:** This qualitative research project explored how teens talk about positive and negative effects of their social media use. Teen participants thought the narratives around social media and well-being are driven mainly by adults and may not fully reflect the experience of teens. [2018]
- **Facebook can help alleviate feelings of loneliness.** Teens (13-17) worldwide reported feeling less lonely than most other age groups, especially young adults (18-24), and were more likely to say Facebook helped them feel less lonely. Teens also rated their interactions on FB as more meaningful than any other age group.
- **Messenger Kids Sentiment Survey:** Both parents and kids view MK positively. On a scale of 1 to 5 (1 being most negative, 5 being most positive), parent reported feeling very close (4.12) to their kids when interacting on MK, viewed their time spent on MK as very meaningful (4.28), felt happy (4.53) when on MK, had a lot of fun on MK (4.25), and are satisfied with their kids' MK experience (4.62). [2018]
- [TO BE PUBLISHED EXTERNALLY] **Everything's the Phone: Understanding the phone's supercharged role in parent-teen relationships:** This mixed-method research project presents a conceptual model showing how parents' and teens' relationships to their phones and perceptions of each other's phone use are inextricably linked and how, together, they contribute to parent-teen tensions. We use the model to consider how the phone might play a less highly charged role in family life and contribute to positive connections between parents and their teen children. [2018] [peer-reviewed collaboration with University of Washington and accepted for CHI 2019 conference]
- [TO BE PUBLISHED EXTERNALLY] **Development of a survey instrument to assess teens' social media interactions and their effect on well-being.** There are currently no validated scales to measure social media interactions. Together with the University of Wisconsin, we developed a survey instrument to assess specific technology interactions. This tool will have significant contribution to the field of research for technology and youth (and go beyond the current platform-specific model). The survey instrument has been developed and will be submitted to a journal soon. *There is a potential showcase for ABC segment, Comms is involved.* (University of Wisconsin collaboration)
- [TO BE PUBLISHED EXTERNALLY] **Relationship between social media use and health/wellbeing of youth:** This large-scale survey will be the first of its kind to assess a combination of variables, beyond the cross-sectional design and to use a parent-child dyadic approach to understand how social media affects well-being in youth. (University of Wisconsin collaboration)
- [TO BE PUBLISHED EXTERNALLY] **Assess short and long-term effects on social media use, health and well-being among teens.** A pilot intervention will compare the American Academy of Pediatrics' Family Media Use plan compared to an awareness raising effort to determine which approach has positive effects on youth and parent social media experiences. (University of Wisconsin collaboration)
- [TO BE PUBLISHED EXTERNALLY] **Evaluate real-time associations between technology use and mood among teens.** An Ecological momentary assessment (EMA) study will help us understand teens' technology use and mood changes in teens. (University of Wisconsin collaboration)
- [TO BE PUBLISHED EXTERNALLY] **Digital device use and family life:** A 2x2 experimental design with parents and their children finds that there is no difference between using devices and not using devices in families' ratings of the meaningfulness of interactions provided families interact TOGETHER.