Technology in Context: The Surprising Social Upsides of Constant Connectivity

Kim Armstrong, APS Staff Writer

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The need to physically distance ourselves in order to "flatten the curve" of the COVID-19 pandemic has left much of the world more reliant on technology to meet our social needs than ever before. Until the virus is contained, the safest way to maintain relationships with many of the people we care about is digitally. Yet the very same technologies that make social distancing bearable have been cited as leading causes of social isolation, mental health issues, and even acts of mass violence.

Thankfully, given that millions of people are now studying and working online, psychological research suggests a more nuanced reality. In many cases, the effects of oft-maligned technologies such as smartphones, social media, and video games appear to be determined not only by use but by social context—that is, how and why we use them, as well as the quality of our relationships offline.

In this interview, Christopher J. Ferguson (Stetson University) discusses how questionable research practices may have exaggerated the relationship between video games and aggressive behavior.

Jump to the end of this article for more on how social context, and playing for the right reasons, influences the effects of gaming.

Moreover, while these technologies may be today's targets, the moral panic surrounding them is nothing new, as Amy Orben (University of Cambridge, England) described in a 2020 article in *Perspectives on Psychological Science*.

These concerns have bubbled up again and again since the rise of the novel, Orben explained, when some feared that "reading addiction" would tempt 18th-century youths into reenacting the risky behaviors found within the pages of classics like *Gulliver's Travels*.

"While past panics are often met with amusement today, current concerns routinely engender large research investments and policy debate," Orben wrote. "What we learn from studying past technological panics, however, is that these investments are often inefficient and ineffective."

With each new technology, she explained, psychological scientists roll the research rock up the hill, scrambling to investigate its effects on children and adolescents and recommend best practices for the public at large. But then another technology comes along—whether it be radio dramas, movies, or the Internet—and the rock rolls back down, restarting the "Sisyphean Cycle of Technology Panics" (the title of her article) all over again.

In addition to fueling public panic, the perception that each new form of media represents a unique, unprecedented threat to society hinders the development of broader theories on the effects of technology, Orben wrote.

"Once a new technology is studied, previous understanding developed by studying an older technology often ceases to be considered. Without an underlying paradigm or reliable conceptual frame to guide research, each researcher is 'forced to build his field anew from its foundations,'" she explained.

The Cost of Connectivity

Despite the many benefits of connectivity, the mere presence of devices such as smartphones may impose a subtle social cost, according to Kostadin Kushlev (Georgetown University) and colleagues Ryan Dwyer and APS Fellow Elizabeth W. Dunn (University of British Columbia, Canada) in a 2019 article in *Current Directions in Psychological Science*. Although the cumulative effects appear to be relatively small, they explained, smartphones can distract us from friends and family in our immediate environment and lead us to opt out of casual interactions with strangers and acquaintances, which have been found to boost mood and feelings of belonging.

Other researchers have proposed that this "technoference" may arise in part because of an evolutionary mismatch that can cause otherwise adaptive human social behaviors to become maladaptive in the context of modern technology use.

"Smartphones and their affordances, although highly beneficial in many circumstances, cue humans' evolved needs for self-disclosure and responsiveness across broad virtual networks and, in turn, have the potential to undermine immediate interpersonal interactions," wrote APS Fellow David A. Sbarra (University of Arizona), Julia L. Briskin (Wayne State University), and Richard B. Slatcher (University of Georgia) in a 2019 article in *Perspectives on Psychological Science*.

There's little evidence, however, that smartphones are "ruining our social lives," as is sometimes suggested in coverage of this kind of research.

Studies of online communication among adolescents—many of them "digital natives" who never experienced a world without the Internet and mobile devices—suggest that these interactions, while potentially alienating to those in an individual's immediate environment, may serve primarily to shore up existing relationships.

Madeleine J. George (Purdue University) and APS Fellow Candice L. Odgers (University of California, Irvine) explored this theory in a 2015 article in *Perspectives in Psychological Science*. Earlier that year, an analysis of four days' worth of text messages from 171 adolescents by Marion K. Underwood and colleagues had found that teens sent 70% of their messages to friends and peers, 21% to romantic partners, and just 1% to adults other than their parents. The effects of this kind of communication may vary significantly between individuals depending on the strength of their existing relationships and mental health vulnerabilities, George and Odgers added.

Further, two studies of 1,200 and 2,000 teens in the Netherlands and Bermuda (Valkenburg & Peter, 2007; Davis, 2013) found that teens who reported more online communication also reported higher-quality friendships and more time spent with those friends offline.

Similarly, a longitudinal study of 1,312 children found that those with strong relationships early in life were most likely to engage in frequent online communication, which in turn led to closer friendships (Lee, 2009). George and Odgers wrote that more isolated individuals have been found to experience greater feelings of loneliness when lurking online for entertainment rather than communication, but they may benefit from social interaction online. Lesbian, gay, bisexual, and transgender youths, for example, often cite online spaces as an important source of social support that may not be available to them in person, though they are also more likely to be the targets of cyberbullying.

"Most online behaviors and threats to well-being are mirrored in the offline world, such that offline factors predict negative online experiences and effects," George and Odgers concluded.

Social Media and Depression: Correlation, Causation, or Both?

The fact remains, however, that rates of depression, anxiety, and suicide increased significantly between 2010 and 2015, the same period in which "iGen"—those born between 1995 and 2012, when smartphones came into common use—began to enter adolescence and higher education, wrote APS Fellow Jean M. Twenge (San Diego State University) and colleagues in a 2018 article in *Clinical Psychological Science*. An analysis of 93 university counseling centers by the Center for Collegiate Mental Health found a 30% increase in caseloads between the 2009–2010 and 2014–2015 academic years, and the suicide rate among American adolescents ages 13 to 18 increased 31%, from 5.38 to 7.04 per 100,000, over the same period.

That increase in the need for counseling could reflect many factors, including a reduction in the stigma surrounding mental health issues, which may lead more students to seek professional help, Twenge and colleagues noted. But, they added, iGen also spends more time on electronic communication and less time interacting face-to-face than any other generation, which may contribute to the feelings of social disconnection and burdensomeness often associated with suicidal ideation.

Through analyzing data from annual surveys of more than half a million American adolescents between 2009 and 2015, Twenge and colleagues found an increase in depressive symptoms (33%) and suicidal ideation or attempts (12%). As these surveys were given to a cross-section of all adolescents, not just those who sought help, the increases were unlikely to be due to greater help-seeking, Twenge adds. Furthermore, the researchers found that these increases were primarily driven by poorer mental health outcomes in girls, with those who reported more screen time (whether spent watching TV, browsing the Internet, or playing video games) and social media use also reporting more symptoms of depression and suicidal ideation. Overall, adolescents who reported 5 or more hours of screen time per day were 66% more likely to report suicide-related outcomes than those who reported an hour or less of screen time per day.

"It seems likely that the concomitant rise of screen time and adolescent depression and suicide is not coincidental," Twenge and colleagues hypothesized, acknowledging that the study's year-to-year comparison only allowed them to determine that screen time and rates of depression and suicide increased within that population during the same period, not what, if any, causal relationship might exist between these factors.

Making these kinds of statements based on correlations between screen time and mental health issues could mislead the general public, however, suggest Yaakov Ophir, Yuliya Lipshits-Brazilер (Hebrew University of Jerusalem, Israel), and Hannanel Rosenberg (Ariel University, Israel) in a 2020 *Clinical Psychological Science* article, leading people to assume a causal relationship exists when there may not be one.

In fact, in a 2019 *Clinical Psychological Science* study of 594 elementary and 1,132 undergraduate students in Canada, Taylor Heffer (Brock University, Canada) and colleagues found that the relationship between these factors, when it exists at all, may run in the other direction, such that symptoms of depression contribute to increased social media use. Throughout the longitudinal study, which followed the elementary students from 2017 to 2019 and undergraduates from 2010 to 2016, students provided an annual self-report of their symptoms of depression and their hours of social media use and other screen time, along with their nonscreen activities. Overall, the researchers found that female elementary students who reported increases in depression were more likely to report increased social media use later in the study. Additionally, depression did not appear to affect social media use, or vice versa, in male adolescents or in college students generally.

"While it may be common in popular media to suggest that social media use might cause depression, our results suggest that this claim may be premature," Heffer and colleagues concluded.

Furthermore, when these effects do exist, they are rarely as influential as they are often made out to be, as Orben and Andrew K. Przybylski (University of Oxford, England) showed in a 2019 *Psychological Science* article. In a time-use-diary study of 17,247 adolescents from Ireland, the United States, and the United Kingdom, the two found that the average effect size related to daily technology use was so small that participants would need to engage in an additional, impossible 63 hours and 31 minutes of technology use per day to become consciously aware of a decrease in their well-being. Even in the case of the largest effect size, the researchers added, participants might be subjectively aware of a decrease in well-being only after 11 hours of overall daily use.

"There is a small significant negative association between technology use and well-being, which—when compared with other activities in an adolescent's life—is miniscule," Orben and colleagues wrote.

Media in Moderation

Whatever the effects of digital-device use, self-reports of past behavior may not be the best measure for studying them. People generally have difficulty accurately perceiving the time they spend on these activities, Orben and colleagues explained. Heavy Internet users in particular have been found to underestimate their time spent online, whereas infrequent users are more likely to overestimate theirs.

Furthermore, although "screen time" may seem like a convenient measure of overall digital-technology use, the concept may be too broad to meaningfully communicate the cumulative effects of different kinds of media. This model of technology use, Orben argued, treats media almost like a medical substance, suggesting that the dosage, or time spent using a technology, is the main determinant of media's effects.

"We want to understand how using 'x' amount of this technology affects adolescents, for example, and in that way we're kind of assuming that this kind of technology will have the same effect on every adolescent," she said. But 20 minutes spent scrolling through social media is very different from 20 minutes video-chatting with family or playing a puzzle game, and each can have different effects on different people, or even on the same individual, on different days.

"The core thing to do in the short term is to think of technology as a more diverse concept than just the time spent on something," Orben said.

In a 2017 *Psychological Science* study of 120,115 English adolescents, for example, Przybylski and Netta Weinstein (University of Oxford) found that the effects of screen time on mental health varied significantly depending on what teens were doing online and when they were doing it. Teens who played video games for over an hour and a half on weekdays, for instance, reported a decline in well-being, but they could play for nearly twice as long on weekends before reporting similar effects.

In contrast to the view of digital-technology use that sees each "dose" of screen time as consuming time that might otherwise be spent on more satisfying offline activities, Przybylski and Weinstein proposed a "digital Goldilocks hypothesis," stressing the importance of moderation in both directions.

"It might be that 'too little' tech use deprives young people of important social information and peer pursuits, whereas 'too much' may displace other meaningful activities," the researchers wrote. "There are empirically derivable balance points, moderate levels, that are 'just right' for optimally connected young people."

Playing for the Right Reasons

The term "gamer" often evokes the image of an adolescent boy slouching into a headset, but the numbers tell a different story, wrote Yemaya J. Halbrook, Aisling T. O'Donnell, and Rachel M. Msetfi (University of Limerick, Ireland) in a 2019 article in *Perspectives on Psychological Science*. The average video game player is 35 years old, with women and girls constituting 41% of the gaming market and more than 65% of U.S. households regularly using at least one device to play games. As with social media, and eating, and a range of other potentially problematic activities, the effects of gaming on well-being seem to depend largely on why and how an individual chooses to partake.

"Video games themselves should not be considered either 'good' or 'bad'; rather, the effect on well-being depends on the aspects [of game play] present, motivation behind game play, and gaming in moderation," wrote Halbrook and colleagues.

Social gaming in particular can positively influence well-being, the researchers noted, especially when games involve cooperative elements that encourage positive interactions, whether with other players or nonplayer characters in the world of the game. It's only when individuals begin to play obsessively, or for escapism and a sense of achievement, that gaming's deleterious effects begin to creep in.

Halbrook and colleagues described a survey of 206 World of Warcraft players ages 14 to 65, in which Huon Longman (Queensland University of Technology, Australia) and colleagues found that players' self-reported fewer symptoms of depression, stress, and anxiety with higher levels of in-game social support. However, individuals who played between 44 and 82 hours per week reported lower levels of offline social support and higher negative symptoms. It seems, then, that playing video games socially is beneficial to well-being, but only when the game is not played in excess, Halbrook and colleagues explain.

While findings on the influence of violent video games on players' real-world aggression and violence remain controversial, social context appears to play a more significant role than what games an individual plays in this case as well. In a 2015 meta-analysis of 101 studies on video games and aggression in *Perspectives in Psychological Science*, Christopher J. Ferguson (Stetson University) found both violent and nonviolent video games to have minimal impact on children's and adolescents' aggression, prosocial behavior, academic performance, and symptoms of depression and attention-deficit disorders.

Additionally, through a longitudinal study of 165 young men, Ferguson and colleagues (2012) found that symptoms of depression, antisocial personality traits, exposure to family violence, and peer influences—but not exposure to violent video games—predicted aggression and instances of dating violence over a 3-year period. Ferguson further confirmed these findings in a 2020 meta-analysis in *Perspectives on Psychological Science* of 62 studies, in which he found no significant evidence of a link between violent video games and aggression.

"Historically, theories of media effects have been focused on 'hypodermic needle'-type theories, in which it is implied that media is essentially injected into passive viewers who automatically model viewed behaviors," Ferguson wrote. "Such theories arguably have not been well supported by the current literature and may suffer from problematic assumptions, such as that the brain treats fictional media similarly to real-life violence exposure."

Rather than serving as hotbeds of violence and aggression, Halbrook and colleagues noted, games like Wii Fit and Just Dance encourage players to be more active, improving measures of physical health such as balance and flexibility. And although "exergames" may be most effective when combined with traditional exercise, individuals may also be more likely to follow through on playing a game than hitting the gym, the researchers observed.

In a 2014 study involving 61 participants with multiple sclerosis, for example, Andreas Kramer (University of Konstanz, Germany) and colleagues found that patients assigned to play an exergame demonstrated the same improvements in balance and gait as those who were assigned a traditional exercise regimen—and were 55% more likely to stick with the intervention up to 6 months later.

"As video games thus far have been mostly perceived as negative, it is important to shed light on the positive impacts video games can have on well-being," Halbrook and colleagues conclude. "These effects are nuanced and moderated by personal as well as video game factors."

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