

STUDIES SHOW

Is Screen Time Really Bad for Kids?

By Kim Tingley

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The first iPhone was introduced in 2007; just over a decade later, in 2018, a Pew survey found that 95 percent of teenagers had access to a smartphone, and 45 percent said they were online “almost constantly.” When researchers began trying to gauge the impact of all this “screen time” on adolescent mental health, some reported alarming results. One widely publicized 2017 study in the journal *Clinical Psychological Science* found that the longer adolescents were engaged with screens, the greater their likelihood of having symptoms of depression or of attempting suicide. Conversely, the more time they spent on nonscreen activities, like playing sports or hanging out with friends, the less likely they were to experience those problems. These and other similar findings have helped stoke fears of a generation lost to smartphones.

But other researchers began to worry that such dire conclusions were misrepresenting what the existing data really said. Earlier this year, Amy Orben and Andrew K. Przybylski, at Oxford University, applied an especially comprehensive statistical method to some of the same raw data that the 2017 study and others used. Their results, published this year in *Nature Human Behavior*, found only a tenuous relationship between adolescent well-being and the use of digital technology. How can the same sets of numbers spawn such divergent conclusions? It may be because the answer to the question of whether screen time is bad for kids is “It depends.” And that means figuring out “On what?”

The first step in evaluating any behavior is to collect lots of health-related information from large numbers of people who engage in it. Such epidemiological surveys, which often involve conducting phone interviews with thousands of randomly selected people, are useful because they can ask a wider range of questions and enroll far more subjects than clinical trials typically can. Getting answers to dozens of questions about people’s daily lives — how often they exercise, how many close friends they have — allows researchers to explore potential relationships between a wide range of habits and health outcomes and how they change over time. Since 1975, for instance, the National Institute on Drug Abuse has been funding a survey called Monitoring the Future (M.T.F.), which asks adolescents about drug and alcohol use as well as other things, including more recently, vaping and digital technology; in 2019, more than 40,000 students from nearly 400 schools responded.

This method of collecting data has drawbacks, though. For starters, people are notoriously bad at self-reporting how often they do something or how they feel. Even if their responses are entirely accurate, that data can’t speak to cause and effect. If the most depressed teenagers also use the most digital technology, for example, there’s no way to say if the technology use caused their low mood or vice versa, or if other factors were involved.

Gathering data on so many behaviors also means that respondents aren’t always asked about topics in detail. This is particularly problematic when studying tech use. In past decades, if researchers asked how much time a person spent with a device — TV, say — they knew basically what happened during that window. But “screen time” today can range from texting friends to using social media to passively watching videos to memorizing notes for class — all very different experiences with potentially very different effects.

Still, those limitations are the same for everyone who accesses the raw data. What makes one study that draws on that data distinct from another is a series of choices researchers make about how to analyze those numbers. For instance, to examine the relationship between digital-technology use and well-being, a researcher has to define “well-being.” The M.T.F. survey, as the *Nature* paper notes, has 13 questions concerning depression, happiness and self-esteem. Any one of those could serve as a measure of well-being, or any combination of two, or all 13.

A researcher must decide on one before running the numbers; testing them all, and then choosing the one that generates the strongest association between depression and screen use, would be bad science. But suppose five ways produce results that are strong enough to be considered meaningful, while five don’t. Unconscious bias (or pure luck) could lead a researcher to pick one of the meaningful ways and find a link between screen time and depression without acknowledging the five equally probable outcomes that show no such link. “Even just a couple of years ago, we as researchers still considered statistics kind of like a magnifying glass, something you would hold to the data and you would then see what’s inside, and it just helped you extract the truth,” Orben, now at the University of Cambridge, says. “We now know that statistics actually can change what you see.”

To show how many legitimate outcomes a large data set can generate, Orben and Przybylski used a method called “specification curve analysis” to look for a relationship between digital-technology use and adolescent well-being in three ongoing surveys of adolescents in the United States and the United Kingdom, including the M.T.F. A “specification” is any decision about how to analyze the data — how

well-being is defined, for example. Researchers doing specification curve analysis don't test a single choice; they test every possible combination of choices that a careful scientist could reasonably make, generating a range of outcomes. For the M.T.F., Orben and Przybylski identified 40,966 combinations that could be used to calculate the relationship between psychological well-being and the use of digital technology.



Illustration by Ori Toor

When they averaged them, they found that “digital-technology use has a small negative association with adolescent well-being.” But to put that association in context, they used the same method to test the relationship between adolescent well-being and other variables. And in all the data sets, smoking marijuana and being bullied were more closely linked with decreased well-being than tech use was; at the same time, getting enough sleep and regularly eating breakfast were more closely tied to positive feelings than screen time was to negative ones. In fact, the strength of the association screen time had with well-being was similar to neutral factors like wearing glasses or regularly eating potatoes.

Not finding a strong association doesn't mean that screen time is healthy or safe for teenagers. It could come with huge risks that are simply balanced by huge rewards. "The part that people don't appreciate is that digital technology also has significant benefits," says Nick Allen, director of the Center for Digital Mental Health at the University of Oregon. These include helping teenagers connect with others. The real conclusion of the Nature paper is that large surveys may be too blunt an instrument to reveal what those risks and benefits truly are. What's needed are experiments that break "screen time" into its component parts and change one of them in order to see what impact that has and why, says Ronald Dahl, director of the Institute of Human Development at the University of California, Berkeley. A screen-related activity may be beneficial or harmful depending on who is doing it, how much they're doing it, when they're doing it and what they're not doing instead. "If we just respond to emotions or fears about screen time, then we actually could be interfering with our ability to understand some of these deeper questions," he says.

Allen notes a vexation: The behavioral data "is already being quantified" on the granular level researchers need. But tech companies don't routinely share that information with scientists. To deliver the advice the public wants, Orben says, will require "a very difficult ethical conversation on data sharing. I don't think we can shy away from it much longer." Till then, parents struggling with how much screen time is O.K. for their children might benefit from trying, as researchers are, to get a more detailed picture of that behavior. "Ask your kids: 'What are you doing on there? What makes you feel good? What makes you feel bad?'" says Michaeline Jensen, of the University of North Carolina, Greensboro. She was an author of a study in August showing that on days when teenagers use more technology, they were no more likely to report problems like depressive symptoms or inattention than on days when they used less. "Even an hour a day, that could be particularly problematic — or enriching."