

Groundbreaking study examines effects of screen time on kids

<https://www.cbsnews.com/news/groundbreaking-study-examines-effects-of-screen-time-on-kids-60-minutes/>

60 Minutes goes inside a landmark government study of young minds to see if phones, tablets and other screens are impacting adolescent brain development

If you have kids and wonder if all that time they spend on their smartphones endlessly scrolling, snapping and texting is affecting their brains, you might want to put down your own phone and pay attention. The federal government, through the National Institutes of Health, has launched the most ambitious study of adolescent brain development ever attempted. In part, scientists are trying to understand what no one currently does: how all that screen time impacts the physical structure of your kids' brains, as well as their emotional development and mental health.

At 21 sites across the country scientists have begun interviewing nine and ten-year-olds and scanning their brains. They'll follow more than 11,000 kids for a decade, and spend \$300 million doing it. Dr. Gaya Dowling of the National Institutes of Health gave us a glimpse of what they've learned so far.

Dr. Gaya Dowling: The focus when we first started talking about doing this study was tobacco, marijuana, all drugs the screen time component really came into play because we were wondering what is the impact? I mean, clearly kids spend so much time on screens.

The first wave of data from brain scans of 4,500 participants is in and it has Dr. Dowling of the NIH and other scientists intrigued.

The MRI's found significant differences in the brains of some kids who use smartphones, tablets, and video games more than seven hours a day.

"We're sort of in the midst of a natural kind of uncontrolled experiment on the next generation of children."

Dr. Gaya Dowling: What we can say is that this is what the brains look like of kids who spend a lot of time on screens. And it's not just one pattern.

Anderson Cooper: That's fascinating.

Dr. Gaya Dowling: It's very fascinating.

The colors show differences in the nine and ten-year-olds' brains. The red color represents premature thinning of the cortex. That's the wrinkly outermost layer of the brain that processes information from the five senses.

Anderson Cooper: What is a thinning of the cortex mean?

Dr. Gaya Dowling: That's typically thought to be a maturational process. So what we would expect to see later is happening a little bit earlier.

Anderson Cooper: Should parents be concerned by that?

Dr. Gaya Dowling: We don't know if it's being caused by the screen time. We don't know yet if it's a bad thing. It won't be until we follow them over time that we will see if there are outcomes that are associated with the differences that we're seeing in this single snapshot.

The interviews and data from the NIH study have already revealed something else: kids who spend more than two hours a day on screens got lower scores on thinking and language tests.

Anderson Cooper: When the study is complete, is it possible that a researcher will be able to say whether or not screen time is actually addictive?

Dr. Gaya Dowling: We hope so. We'll be able to see not only how much time are they spending, how they perceive it impacting them, but also what are some of the outcomes. And that will get at the question of whether there's addiction or not.

Anderson Cooper: When will you have the answers that you're searching for?

Dr. Gaya Dowling: Some questions we'll be able to answer in a few years. But some of the really interesting questions about these long-term outcomes, we're gonna have to wait awhile because they need to happen.

That delay leaves researchers who study technology's impact on very small children anxious.

Dr. Dimitri Christakis: In many ways, the concern that investigators like I have is that we're sort of in the midst of a natural kind of uncontrolled experiment on the next generation of children.

Dr. Dimitri Christakis at Seattle Children's Hospital was the lead author of the American Academy of Pediatrics' most recent guidelines for screen time. They now recommend parents, "avoid digital media use, except video chatting, in children younger than 18 to 24 months."

Dr. Dimitri Christakis: So what we do know about babies playing with iPads is that they don't transfer what they learn from the iPad to the real world, which is to say that if you give a child an app where they play with virtual Legos, virtual blocks, and stack them, and then put real blocks in front of them, they start all over.

Anderson Cooper: If they try to do it in real life, it's as if they've never done it before.

Dr. Dimitri Christakis: Exactly. It's not a transferable skill. They don't transfer the knowledge from two dimensions to three.

Dr. Christakis is one of the few scientists who have already done experiments on the influence screens have on children under the age of two. It's a critical period for human brain development.

Dr. Dimitri Christakis: If you're concerned about your teenager being addicted to their iPhone, your infant is much more vulnerable and using the exact same device.

Anderson Cooper: Your infant is more vulnerable because why?

Dr. Dimitri Christakis: Because the experience of making something happen is so much more gratifying to them.

In a small pilot study that Dr. Christakis conducted on 15 children, researchers gave toddlers three toys: first a plastic guitar, then an iPad that played musical notes and finally an iPad with an app that rewarded the kids with lights, colors and sounds.

Dr. Dimitri Christakis: So at a very specific time, the research assistant will ask the child to give what they're playing with back.

Anderson Cooper: To give it to the research assistant.

Dr. Dimitri Christakis: To give it to the research assistant.

Sixty-six percent of the time with a traditional toy, the child will do just that.

Dr. Dimitri Christakis: With the iPad that simulates that, they give it back almost with the same frequency. But with the iPad app that when they push on it, it does all kinds of things, they're much less likely to give it back.

With the more interactive iPad app, the percentage of kids willing to hand it back to the researcher dropped from 60 percent to 45 percent.

Anderson Cooper: It's that much more engaging?

Dr. Dimitri Christakis: It's that much more engaging. And that's what we find in the laboratory.

It's engaging by design, as Tristan Harris told us in a story we reported more than a year ago.

Tristan Harris: There's a whole playbook of techniques that get used to get you using the product for as long as possible.

Harris is a former Google manager who was one of the first Silicon Valley insiders to publicly acknowledge that phones and apps are being designed to capture and keep kids' attention.

Tristan Harris: This is about the war for attention and where that's taking society and where that's taking technology.

Anderson Cooper: You know it's one thing for adults, for kids this is a whole other thing?

Tristan Harris: That is where this gets particularly sensitive...is developmentally do we want this war for attention to be affecting our children?

Anderson Cooper: Do you think parents understand the complexities of what their kids are dealing with?

Tristan Harris: No. And I think this is really important. Because there's a narrative that, oh, I guess they're just doing this like we used to gossip on the phone, but what this misses is that your telephone in the 1970s didn't have a thousand engineers on the other side of the telephone who were redesigning it to work with other telephones and then updating the way your telephone worked every day to be more and more persuasive.

Until recently, it was impossible to see what happens inside a young brain when a person is focused on a mobile device. But now scientists at the University of California, San Diego have hacked that problem.

Dr. Kara Bagot is an investigator on that \$300 million NIH study. Her team is scanning teenager's brains as they follow Instagram, the most popular social media app. When we met 18-year-old Roxy Shimp, she was about to participate in Dr. Bagot's study.

Anderson Cooper: How much time do you actually spend on screens?

Roxy Shimp: I check my phone pretty regularly I'd say.

Anderson Cooper: What's pretty regularly?

Roxy Shimp: Every at least 10 to 20 minutes.

Anderson Cooper: Is that a conservative estimate?

Roxy Shimp: Probably.

She can't take her phone into the MRI because of the powerful magnets in the machine, so a mirror has been placed above her face to allow her to look across the room at a movie screen displaying images from her Instagram account. This way, Dr. Bagot can see exactly which parts of the brain's reward system are most active while using social media.

Anderson Cooper: So you can actually see a part of the brain light up when you're feeling good.

Dr. Kara Bagot: Yes, in the scanner.

Anderson Cooper: In the scanner.

Based on her data and the results from other studies, Dr. Bagot is among scientists who believe screen time stimulates the release of the brain chemical dopamine, which has a pivotal role in cravings and desire.

Dr. Kara Bagot: So you're more likely to act impulsively and use social media compulsively instead of, like, checking yourself.

Anderson Cooper: You want to keep on it to keep getting--

Dr. Kara Bagot: The good feelings.

Teenagers now spend on average four and a half hours a day on their phones. All that time has resulted in a fundamental shift in how a generation of American kids acts and thinks.

Jean Twenge: When smartphones went from being something only a few people had to something that the majority of people had, it had this really big effect on how teens related to each other.

"it should be a tool that you use. Not a tool that uses you."

Jean Twenge is a psychology professor at San Diego State University. She spent five years combing through four large, national surveys of 11 million young people since the 1960's. She discovered sudden changes in the behavior and mental health of teens born in 1995 and later, a generation that she calls "I-gen".

Jean Twenge: They're the first generation to spend their entire adolescence with smartphones so a lot of them can't remember a time before smartphones existed.

Anderson Cooper: There have been generational shifts before in the past, haven't there?

Jean Twenge: Certainly. But this one's much more sudden and pronounced than most of the others.

The iPhone was introduced in 2007. Smartphones gained widespread usage among young people by 2012. Jean Twenge says she was startled to find that in the four years that followed, the percentage of teens who reported drinking or having sex fell. But the percentage who said they were lonely or depressed spiked. It's possible other factors may have played a role, but Twenge says she wasn't able to identify any that correlated as closely as the growing popularity of the smartphone and social media.

Jean Twenge: It's not just the loneliness and depression from these surveys. It's also that ER visits for self-harm like cutting have tripled among girls age 10 to 14.

Anderson Cooper: What are teens doing on their phones that could be connected to depression?

Jean Twenge: It could be anything. There's kind of two different schools of thought on this. That it's the specific things that teens are doing on their phones that's the

problem. Or it could be just the sheer amount of time that they're spending on their phones that is the problem.

Finding definitive answers about social media's influence on mental health can be a frustrating exercise. Eighty-one percent of teens in a new national survey by the Pew Research Center said they feel more connected to their friends and associated social media use with feeling included. But in a month-long experiment at the University of Pennsylvania, college students who limited themselves to just 30 minutes a day on Facebook, Instagram and Snapchat reported significant decreases in loneliness and depression.

Jean Twenge: A lot of times with these technological shifts is these things are adopted because they're so wonderful and convenient. And we don't realize until later the possible consequences. And I think fortunately in the last year or so there's been more discussion about how can we manage the use of our devices.

Facebook and Instagram have introduced settings to allow users to monitor app use. And Apple, the company that started the smartphone revolution, has built a new feature for parents to set time restrictions on apps.

Anderson Cooper: Tech companies say there are tools out there that they have supplied and that they're doing their part.

Jean Twenge: A lot of parents, probably the majority I talk to, don't even realize those tools are available. and I wish they happened five years ago instead of now. But better late than never.

For its part, the National Institutes of Health has just finished enrolling the 11,000 kids for its landmark brain study. Early next year, the data will be made available to any researcher around the world investigating the effect of a device that's become the most dominant technological presence in young lives.

Jean Twenge: Smartphones are great things, They are a wonderful piece of technology. They allow us to find our way around and look up the weather and do all that kind of stuff. And if you do it for a half an hour or an hour a day, fine. No problem. Then you're using it for what it's good for. But you have to use it for what it's good for and then put it down. I mean, it should be a tool that you use. Not a tool that uses you.

Produced by Guy Campanile and Andrew Bast. Associate producer, Lucy Hatcher