How can smartphones change our way of thinking?

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Digital devices attract people's attention like a new dependency. Can smartphones change our way of thinking?

Smart phones can easily connect, store data and get directions. But exactly what digital technology changes our brain is still an unanswered question.

Photo source: TASSII / ISTOCKPHOTO
Not long ago, the Internet gradually stabilized. Mostly, we browse the web from the desktop in the living room or office. If you feel that it is somewhat risky, we will bring our laptop to a coffee shop for example. Those days seemed odd right?

Today, the Internet moves through people's daily lives. We hunt Pokémon while walking on the sidewalk, texting while waiting for the red light and tweeting from the bathroom. Even if you can sleep on the phone while holding your phone, we use it as a sleep device and an alarm clock. Sometimes we can put the phone down while eating, but often face it all day, just in case something important happens.

Smart phones like iPhone, Android and many others make it easy to adjust our behavior. Cell phone technology has changed our driving habits, dating styles and even our posture. Although currently some articles with the title suggest that digital technology is ruining our brains, regardless of what it does for our children, we have welcomed the " *charming life partner.* " "This is with the extended hand and the clawed finger.

Scientists suspect that constant interactions with digital technology can affect the brain. Small studies suggest that digital technology devices can **change the way of remembering** , **how to navigate** and **how to create happiness** - or not.

90% of Americans report using technology equipment before bedtime

Source: Michael Gradisar et al / J. Clin. Sleep Med. two thousand and thirteen

49% of US University students report phone checks at least once overnight

Source: L. Rosen et al / Sleep Health 2016

Although this is somewhat limited, sometimes conflicting findings show how science has tried to overcome the " *fast slide* " phenomenon. Studies conducted in the laboratory suggest that technology and smartphone discontinuities can change people's thinking strategies. Like our husbands and wives, mobile devices have become " *partner memory* ", allowing us to store information there and forget about it - " *reducing data load* " comes with benefits. useful and limited. Positioning strategies may be changing in the GPS era, a change that can reflect in the way the brain arranges its location in the world. Even continuous interaction with technology can increase anxiety in certain environments.

However, a large study asked people about their digital lives showing that **the use of digital technology at a moderate level does not have a negative effect on the spirit.**

The question of how technology helps and hinders our thinking is quite difficult to answer. Both laboratory and observation research have drawbacks. Experimental psychologist Andrew Przybylski of Oxford University said: " *Artificial limits of laboratory research lead to unlimited observations, insights that may not apply to life. This is similar to drawing conclusions about the effects of baseball on the player's brain after observing three shots in the polished cage.* "

However, observational studies of real-world behavior produce links, not just causes. It is hard to draw real effects from the chaos of life. Some scientists said: " *The goal is to design studies to bring the lab's rigor to the complexity of real life, then use deep insights to guide "But it is a big and possible goal that scientists set out to never achieve* ."

Evolutionary neurologist Leah Krubitzer is comfortable with this scientific ambiguity. Leah Krubitzer does not give positive or negative reviews for current " *digital landscape"* . " *It is neither good nor bad, just a repetitive environmental change* ," said Krubitzer, of the University of California, Davis.

" *I can tell you for sure that technology is changing our brains. Just so far, no one knows what those changes mean,* " Leah Krubitzer added.

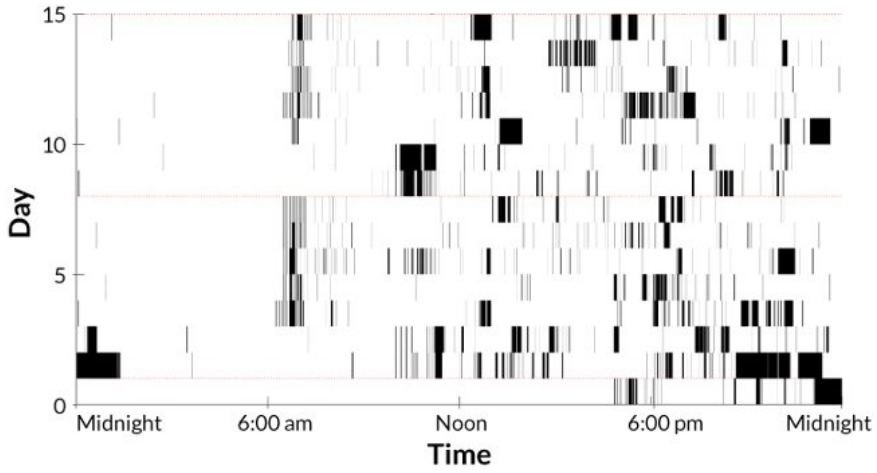
Of course, almost everything can change the brain. Music training reshapes parts of the brain, learning about London's complex paths bulging like a mapping structure in the brain. Even good sleep changes the brain. Every aspect of the environment can affect the mind and behavior. Therefore, digital technology is no different. However, some scientists suspect that there may be something particularly toxic in the grip of digital technology on the brain.

1. Is it possible that someday cells in your body can connect to your smartphone?

Neuroscientist Adam Gazzaley of the University of California, San Francisco said: " *We are information-seeking creatures. We are aiming at very powerful ways. Today's digital tools for we have an unprecedented opportunity to communicate with information that doesn't wait for you to find out that it is looking for you.*

Although there are many unanswered questions about whether digital devices affect our minds and behavior and whether good or bad, digital technology is moving forward. . Krubitzer said: " *We should have raised such questions in the 70's and 80's. It's too late now. We're closing the warehouse after the horse runs out.* "

Screentime - Time table



A group in the UK designed the Android application to track the mobile use of Lincoln University students and staff for 15 days. The application is registered when the screen of the phone pops up and then off, the charts as shown below describe the daily operation of a normal phone user. The wider bars mean longer time to use the phone. Of course, it is normal to use an alarm clock to wake up on weekdays. Saturday is marked with a red broken line.

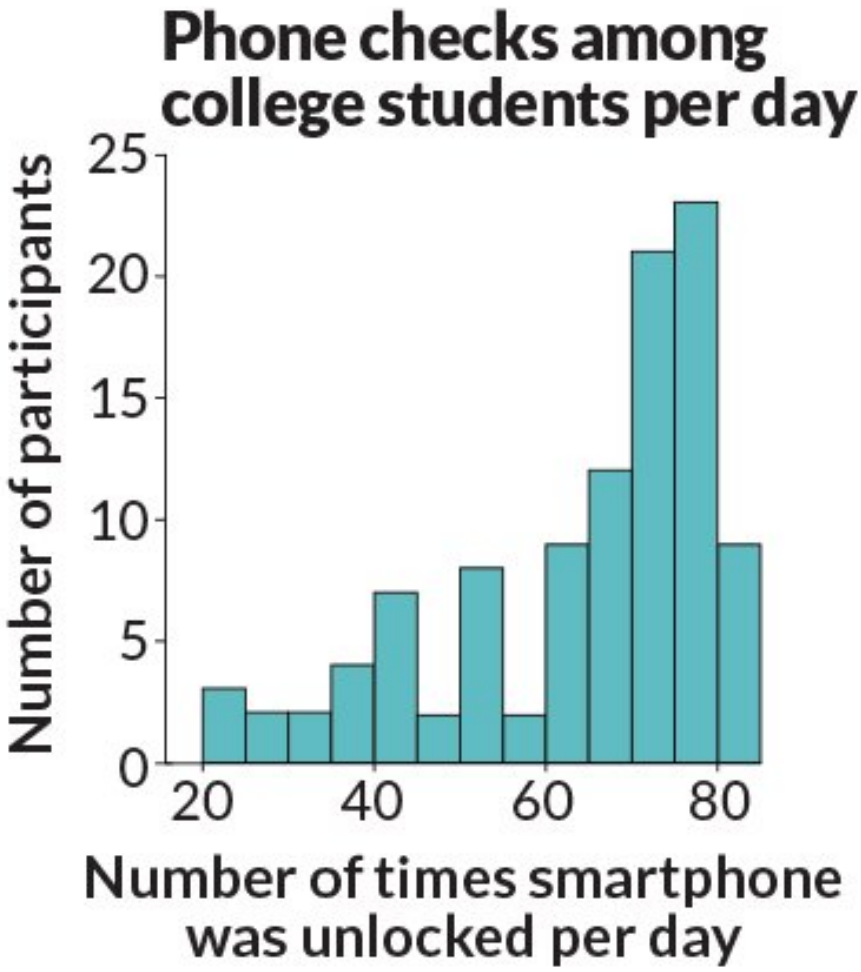
Look for information

The difference between digital technology today and initial progress (*such as landline phones*) is the time people spend with it. In just a decade, smartphones have saturated the market, allowing high-speed Internet access to about 2 billion people around the world. In a small study reported in 2015, 23 adults aged between 18 and 33, spent an average of 5 hours a day using their phones, divided into 85 different uses during the day. When

asked how many times they thought they were using the phone, only half of the people participated in the assessment.

In another study, Larry Rosen, a psychologist at California State University, Dominguez Hills, used the application to monitor the frequency of college students unlocking phones. " *Students often check their phones an average of 60 times a day, each lasting about three to four minutes, totaling about 220 minutes a day. That's interruption* ," Rosen said.

Did I miss something?



In a small study of 104 college students, more than half had unlocked their phones more than 60 times / day.Photo source: L. Rosen

" *Smart phones are everywhere in the world 24/7 and as such, it is almost like an indispensable accessory. Often, we are forced to look at this new item, because they are more attractive. "This is what is around us. This device is really powerful, affecting our behavior. It has changed the way we see the world* ," Rosen said.

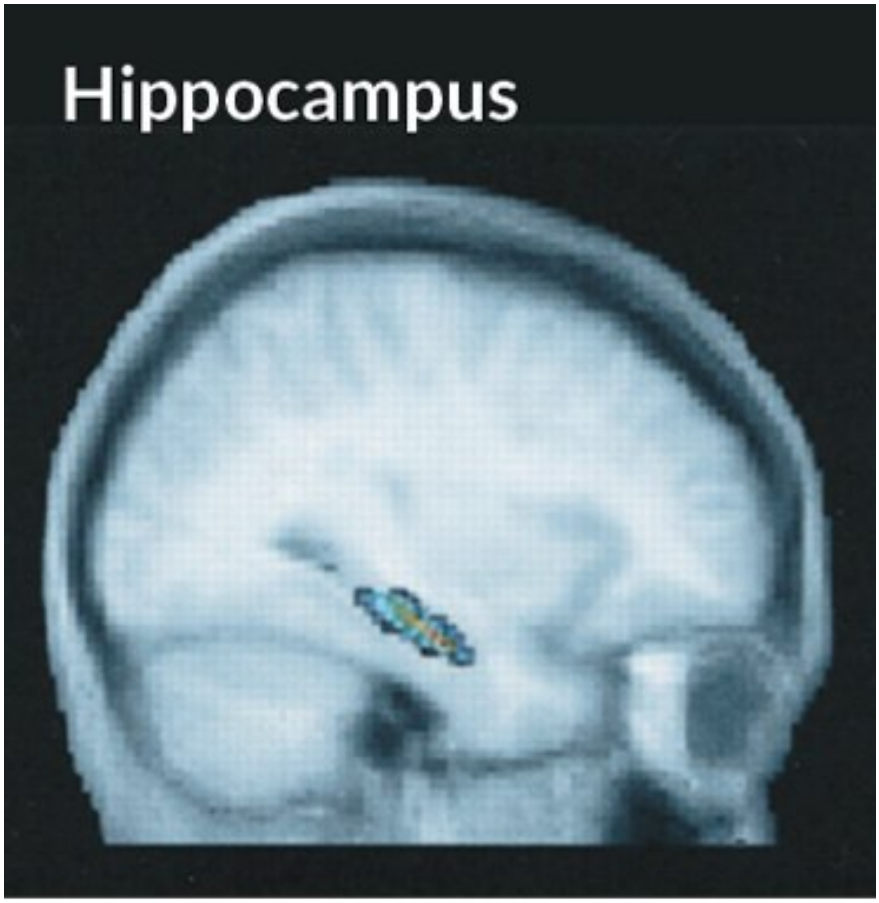
Technology has done that. According to Przybylski, printed newspapers, electronic newspapers, televisions and phones all change people's habits. But the intensity of digital technology has melted the human brain and the ravaged social life is just the latest embodiment of fear of changing old age. " *You have to ask yourself, 'Is there anything wonderful about the power of LCD screens?* " Przybylski said.

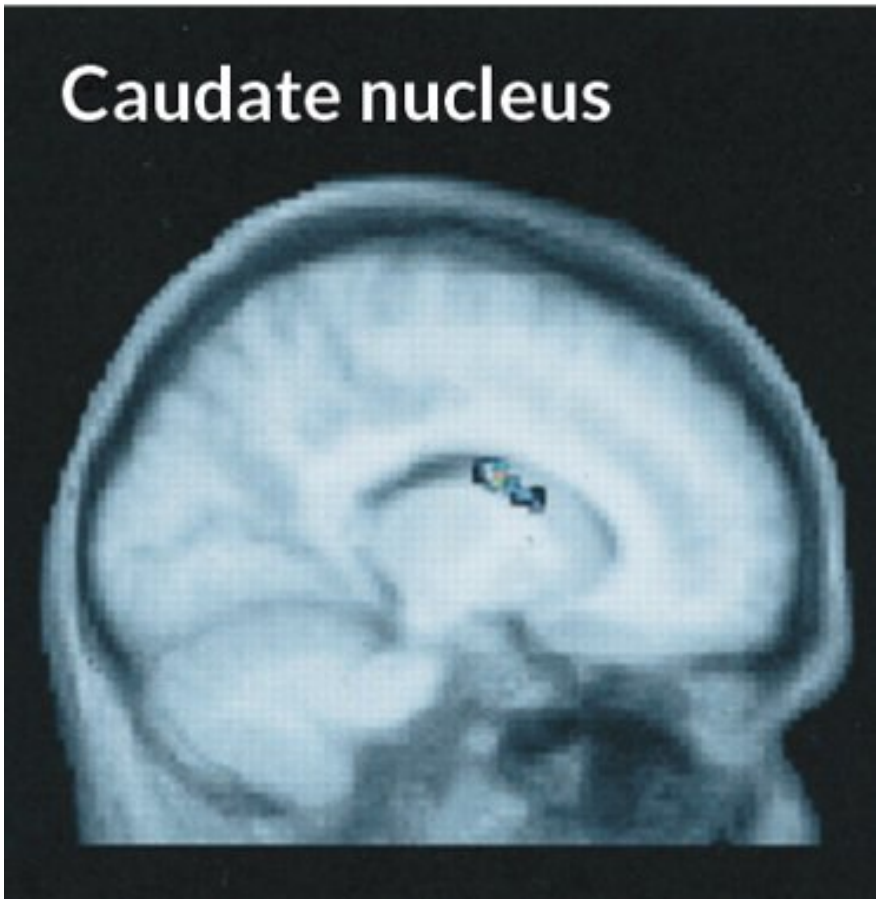
However, some researchers suspect that there is something particularly attractive in this progress. " *It's different. Computers, the Internet and the cloud are 'embedded' in our lives. The scope of the amount of information we have at hand can exceed anything we do. Temptation becomes really dependent on it seems to be bigger,* "said psychologist Benjamin Storm of the University of California, Santa Cruz.

1. 15 habits of wasting time need to be removed immediately

Memory outsourcing

"Digital technology can encourage more trust, at least memory, " Storm's research shows. Sixty college students are offered a mixture of knowledge questions based on multiple disciplines - some easy sentences, some difficult sentences. Half of the students must answer the questions themselves; the other half said to use the Internet. They were then given a series of easier questions, such as: "What is *the center of the storm called?* " This time, they were told they could use the Internet if they wanted to.


Hippocampus


Caudate nucleus

Storm and colleagues reported online in July last year in memory. " *Early internet users were more likely to rely on the help of the Internet for further questions. Those who are used to the Internet continue to do so, even though they already know the answer. Habits "This overuse can signal a change in the way people use their memory. We no longer do what we rely on and knowledge we know,* " Storm said.

That research is based on the results published in a 2011 paper on Science. A series of experiments shows that those who desire to have Internet access then ' *less effort* ' to remember everything. In this way, the Internet has a foothold, previously filled by remembering birthdays, remembering recipes and remembering the correct paper codes - is officially known as " *memory partner switch* ".

" *We are becoming sympathetic to our computer tools. The experience of losing Internet connectivity is becoming more and more like losing a friend. We still have to plug in to know what Google is. know,* "Betsy Sparrow at Columbia University and colleagues wrote in 2011.

" *Digital crutches are not bad. Popular human memory is weak, sensitive to the wrong memories and completely forgotten. Although not perfect, the Internet can be a good source of information. And. it is uncertain whether our memories are really worse, or that we are only doing the same level of just getting the answer in a different way, "* Storm pointed out.

" *Some people think that memory is declining completely because we use technology. Others disagree. Based on the current data, however, I don't think we can really come up with these. strong conclusions in one way or another,* "Storm added.

" *The potential obstacles of this outsourcing memory are ambiguous. Maybe digital dependence affects - and can weaken - other parts of our thinking. It changes the way they are. Do we change the way we exchange information with each other, build our own stories, to create new ideas? Maybe there are things that we don't need ourselves. are you aware? "* Storm said.

Studies by Gazzaley and other companies have recorded the effects of interruptions and multi-tasking, unavoidable with constant news announcements, status updates and Instagrams waiting in their pockets. me. " *Siphoning attention can cause problems with a long list of thinking skills, including memory, attention, awareness and short and long-term reaction time. However, these findings stem from Laboratory studies require a person to switch between two tasks while performing brain scans, for example, the same effects are not clear about our daily lives , "* Gazzaley said. But Gazzaley believes that continuous disruption - cries and buzzes - non-stop phone testing is affecting our ability to think.

Look up the map

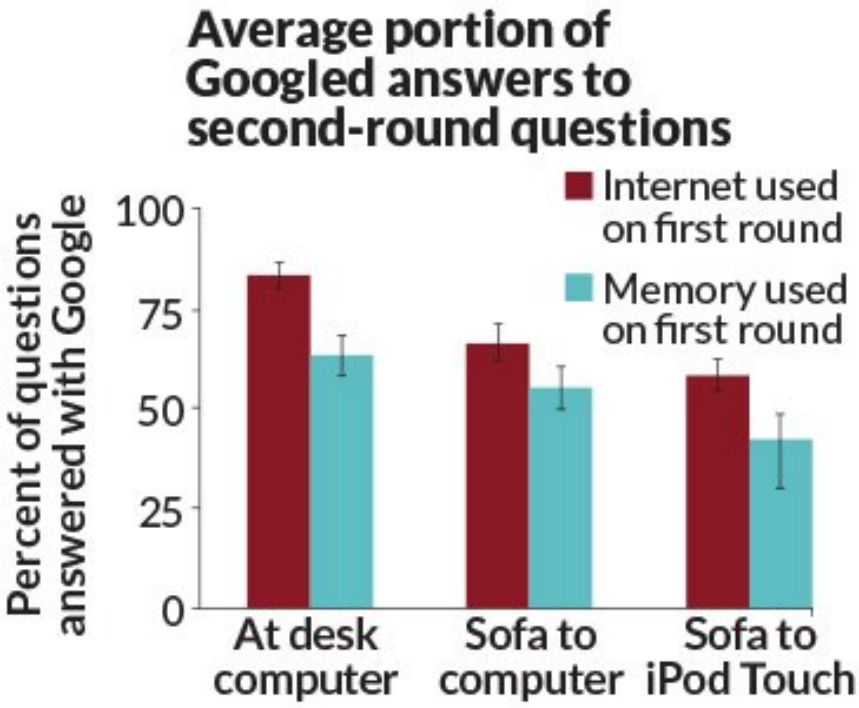
The influence of technology is beginning to appear for another cognitive task - navigation, especially while driving. Instead of checking the map and planning a trip ahead, people can rely on smartphones to do the work for them. Anecdotes describing GPS-based anecdotes instruct them to drive into the lake or through barriers at the entrance of a partially destroyed bridge. Cognitive neuroscientist - Véronique Bohbot of McGill University in Montreal says that navigational skills can be at risk when we move to easier neurological ways to find the way.

Historically, go to the right spot to get the land, a spiritual map of the terrain. That strategy requires more work called *"response strategy* ", the type of navigation that begins with the electronic voice command. " *You just need to know the answer - turn right, turn left, go straight. That's all you know. You're driving automatically,* "

Bohbot said.

Google was born Google

Compared to those who have to rely on memory (*blue bar*) to answer the original difficult puzzles, those who use Google to find the answer (*red bar*) are more likely to use Google for a series Next easy question. The inconvenience (*having to wake up from the sofa to get a computer or iPod Touch*) didn't stop Googling.



Source: BC Storm, SM Stone and Benjamin AS / Memory 2016
An easier response strategy, but with less knowledge. Researchers have found that people passing through a town in Japan with human guidance have done better when using GPS.

Scientists are looking for signs that video games often cause people to experience heavy reactions, affecting the way people around them. In a small study, Bohbot and colleagues reported in 2015 in the Proceedings of the Royal Society B that discovered: " *Those who spend an average of 18 hours / week playing video games like Call of Duty driving another For people who don't play video games When tested on virtual mazes, action electronic players tend to use more simple feedback learning strategies to overcome* . "

The easier " *response navigation"* control type depends on *caudate nucleus* (*caudate nucleus*), the brain region is thought to be involved in habit formation and " *addiction* ". In contrast, nerve cells in *hippocampus* (*hippocampus are part of the anterior brain, a structure within the temporal lobes*) that helps create mental maps of the world and supports complex navigation. than. Some results show that those who use reactive methods have larger tail nuclei and more brain activity there. In contrast, space strategy users require a mental map with larger, busier hippos.

The results on the video game player are preliminary and show that a link in a group can share potential similarities. However, it may be that the mental habit is easy to change - the way people navigate. " *Digital*

technology is not itself to blame. It's not that technology is necessarily good or bad for the brain. That's how we use technology. We tend to use it in an easy way." The easiest *, there is no need for much effort ,* "Bohbot said.

Parts of the brain, including those who use navigation, have many jobs. Changing one aspect of brain function by one kind of behavior may involve other aspects of life. A small study by Bohbot shows that people who move by leaning on the tail nucleus smoke more, drink more alcohol and are more likely to use marijuana than those who rely on hippocampus. What makes that connection still very much in the air.

Other researchers are trying to solve questions about how technology affects our psychological viewpoints. Rosen and his colleagues have come up with clues that digital devices have become a source of worry for everyone.

45% of people aged between 14 and 18 reported always or almost texting while watching TV.

Source: Deloitte 2016 Digital Democracy Survey

In rigorous experiments, Rosen of California State took the phone of college students away, with the aim of interfering with laboratory stress measurements such as heart rate and sweating. The phones are left, but placed out of reach of students who are reading a passage. Later, researchers began texting students who were forced to listen to unwanted messages. Measuring nervous anxiety, Rosen found and read it clearly.

Other experiments show that technology users last about 10 minutes without a phone before there are signs of anxiety.

Basically, the interruption in smartphone access is no different from the days before the smartphone, when the phone tries to vibrate when you enter the house with a full bag of groceries. , so you missed the call. Both of these situations can increase anxiety about missed connections. However, Rosen suspects that our dependence on digital technology makes these situations more frequent.

" *This technology is awesome. Saying that, I think this continuous bombardment needs to be checked, needs to be connected, my feeling cannot be disconnected, can't be stopped for five minutes. That will bring a lasting effect ,* "Rosen said.

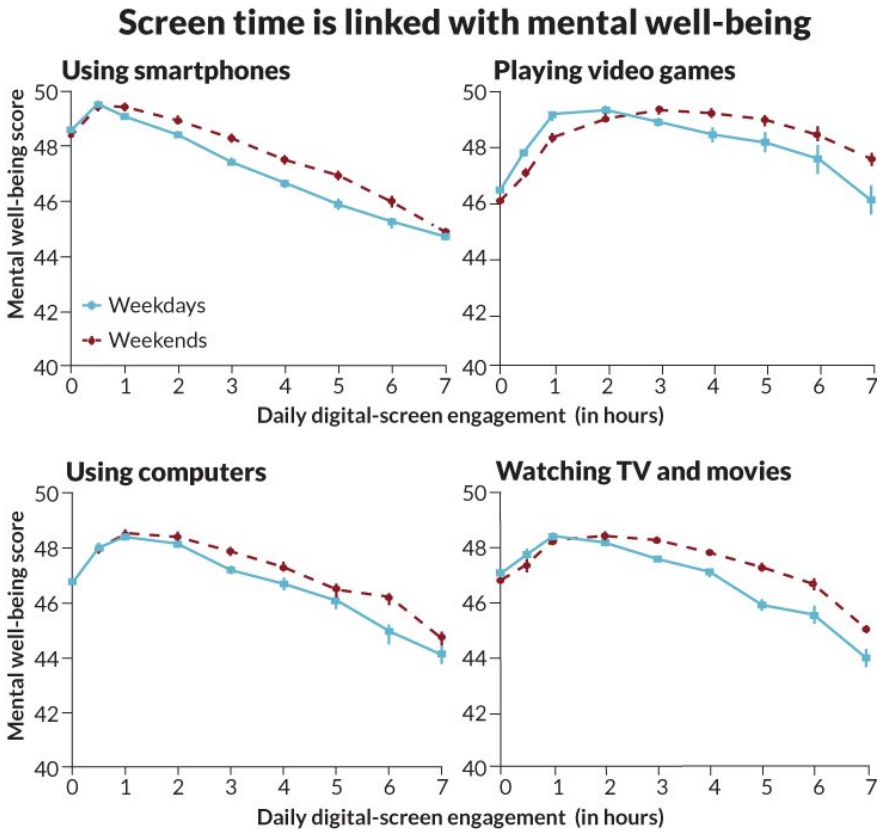
The question of whether good or bad digital technology for humans is nearly impossible to answer, but in a survey of 120,000 Britons aged 15 (*99.5% reported using technology daily*). Przybylski of Oxford and Netta Weinstein at Cardiff University in Wales have suggested that moderate-level digital use - TVs, computers, video games and smartphones - correlate with Good mental health, measured by questions about happiness, satisfaction of life and social activity.

When the researchers planned to use technology to counteract the spirit of comfort, a curve in the picture emerged, highlighting what researchers call " *Goldilocks spot* " of technology used - no too little and not too much.

Przybylski said: " *We find that you have to write a lot of text messages. For smart phone use, gentle conversions can be harmful if used more than two hours on weekdays. - mathematical analysis shows* ". " *The use of entertainment computers often has a longer limit: 4 hours and 17 minutes,* " the researchers wrote in Psychological Science in February.

Screen about age

Based on a survey of 14 questions about happiness and satisfaction in life, it seems to change the number of hours using digital media. The average age is between 40 and 50. Each type of media has a good point, suggesting that moderately using digital technology can be beneficial.



Source: AK Przybylski and N. Weinstein / 2017 Psychological Science
" *For many users, the relationship between technology use and inferior mental health is not all. Potential negative effects over the entire screen time are less than 1 / 3 dimensions of positive influence when eating breakfast*, "Przybylski and Weinstein discovered.

" *Even if the relationship between technology use and mental health is worse, scientists still don't know why. Perhaps this effect comes from replacing something, such as exercise or socializing, not technology , "* Przybylski said.

We can never know how digital toys form in our brains. Technology is constantly changing. Our brains must respond and adapt to it.

Krubitzer said: " *Neocortex - the new human brain basically creates itself through the next generations. That's what people grow up in the digital environment, there will be a brain that reflects the environment. We used stone to shave nuts in daily texting, obviously our brains have changed.* "

Maybe these changes are a good thing, perhaps better to prepare the next generation to succeed in a digital world. Or maybe we will discover that when we no longer have to try to remember the phone numbers of loved

ones, one important thing will quietly drift away.

This article was published in Science News on April 1, 2017, titled " *Digital minds: Are smartphones changing our brains?* " (*Roughly translated: "The mind makes smartphones change our brains. " or not? "*).

Refer to some more articles:

1. 10 middle-aged crisis warning signs everyone needs to know
2. How to shorten sleep time but still ensure health?
3. 10 reasons why smartphones negatively affect your health

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