

Inquiring Minds

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“Has Technology Eaten Our Minds?” Discussion Leader: Melissa Butler

It's a truism to claim that new technologies have changed all of our lives. The four papers below explore these changes. Larry Alton writes "While it's easy to identify the negatives and proclaim the deficiencies of modern technology, we have to remember that positives abound." But he doesn't really tell us what those positives are! What do you think they are?

Conner Forrest notes that "we sense that tech is changing the way we think. The big question is how it is changing the way we think and what are the results of that?" What do you think about the major changes he outlines?

Vanderhei and Fischer point out that we are "better connected than at any point in humanity — but not necessarily better informed. We've been hit with more technological innovations than we are capable of responsibly handling." Ultimately," they say, "the burden will fall on individual consumers to exploit what should be the golden age of information by adjusting their own habits." Is this a cop-out? Or something our social/ political/educational institutions should address?

Finally, we get a view from "down under," from Andi Horvath who reminds us that "Humans have always had a symbiotic relationship with technology. After all we humans designed our tools." "But," she asks, "is there a better way to work with technology?" What are your thoughts?

Larry Alton, "4 Ways Technology Impacts the Way We Think," *Social Media Week*,
January 18th, 2016

Technology is a part of our daily lives more than ever before, but with the right mindset, the positives can far outweigh the negatives.

The pervasiveness of technology in our everyday lives means we don't ever slow down to think about what's really happening. Instead of communicating with people in a face-to-face manner, we're constantly staring at tablets, typing away on touchscreen keyboards, and gluing smartphones to our ears.

While there are certainly positives that come with new technology, what's the psychological impact of our affinity for technology?

1. Technology Impedes Our Focus

If you've ever tried to have a conversation with your spouse while they're watching something on TV, you realize just how much technology impedes our ability to focus on other things. It's as if nothing outside of the technologies we channel our focus into exist. In certain situations this can be amusing, but in other situations it's downright scary. Consider the fact that talking on a mobile phone while driving reduces brain activity associated with driving by [as much as 37 percent](#). In other words, when you're talking on the phone while driving down the highway, your brain is only operating at 63 percent of the normal capacity. That's a sobering thought.

2. Technology Changes How We Read

Have you ever caught yourself scanning through the pages of a book, as opposed to reading the words line by line? If so, you aren't alone. The internet has actually changed the way we, as a society, read. Instead of consuming content in a linear fashion like the generations before us, we now scan for keywords, search for links, and grab small bits of information.

“When you try to read a novel, it’s almost like we’re not built to read them anymore, as bad as that sounds,” says [Brandon Ambrose](#), a 31-year-old financial analyst and avid reader. This is a direct result of our brains adapting to new content formats.

3. Technology Prompts FOMO

Do you suffer from FOMO? That sounds a little bit like the introductory line to a pharmaceutical drug commercial, doesn’t it? Well, thanks to the proliferation and pervasiveness of social media in our everyday lives, FOMO has become a very real psychological issue.

In case you aren’t familiar with the term, [FOMO is the acronym](#) for “Fear of Missing Out.” It’s a complicated blend of anxiety, irritation, and inadequacy. It typically happens when you’re doing something boring or ordinary and you see pictures, videos, and posts from your friends who appear to be doing things that are more fun and exciting. Naturally, you feel like you’re missing out on something.

4. Technology Removes Us from Moments

Next time you’re at a concert, event, or tourist attraction, conduct a little experiment. Look around you and count the number of people who have their phones, cameras, and tablets out snapping pictures and recording videos. Can you even count them all? Next, try to count the people who are fully engaged, with no electronics in hand. Can you find any?

This issue is directly tied to FOMO. In a digital age where our lives are broadcasted for everyone to see, we want to make sure everyone knows where we are and what we’re doing. As a result, we spend more time projecting an image than enjoying experiences.

Searching for the Positives

“Despite all the very real concerns, mobile technology can be harnessed to improve our minds,” says [Adam Gazzaley](#), M.D., Ph.D. “There are ongoing efforts by cognitive science laboratories and companies to develop cognitive assessment and brain training software that will function on mobile phones and tablets. This field is still in its infancy, but early signs are encouraging.”

While it’s easy to identify the negatives and proclaim the deficiencies of modern technology, we have to remember that positives abound. Right now, it’s just a matter of protecting our brains and finding ways to offset the negatives before they become even more pervasive.

Conner Forrest, “How tech is changing the way we think and what we think about,” ***Tech Republic***, October 6, 2014

There are a myriad of arguments for and against the increased use of technology in everyday life. Futurists and technophiles encourage its use, sure that technology will welcome a new utopia, while luddites rail against the “destructive” nature of technology use.

We sense that tech is changing the way we think. The big question is how it is changing the way we think and what are the results of that?

That is what Clive Thompson, a writer for *Wired* and *The New York Times*, decided to explore in his new book, *Smarter Than You Think*. Thompson presented the key points of the book at the 2014 IdeaFestival in Louisville, Kentucky on Friday, October 3.

According to Thompson, technology is changing the way we think in four major ways:

- 1 Public thinking
 - 2 Ambient awareness
 - 3 New literacies
 - 4 Collaborative thought
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During the Stalin regime, government photos were augmented to remove people that fell out of favor with Stalin. Thompson noted that, in part, George Orwell's 1984 derived many of its literary motifs from the Soviet Union's practices at this time. Orwell's big fear was that if you could change the past (by changing historical content as on a photo), then you could change the future.

This was seen in the 1990s when Adobe Photoshop rose to prominence. The scare that people would be fooled by fake photos was a real fear for some people. Once photomanipulation became a folk art, though, Thompson said that people are getting better at detecting it. The way we think about photos, especially digital photography is changing. For example, bloggers figured out that the four missiles in a famous 2008 press photo from Iran were fake, even after they were published.

As we engage these technologies, Thompson argues that we are trending towards public thinking, or thinking out loud. This was typically not the case before the internet came along. After completing college, most people didn't write anything publicly unless it was their profession. Now, according to Thompson's estimate, 3.6 trillion words are written per day. New publishing platforms, such as blogging tools like Wordpress, and social media tools such as Twitter have enabled this.

There is an audience effect that, as soon as an audience is present, we feel that we have to bring out the best in what we are doing. Public thinking connects us to other thinkers. You can find, as Thompson said, "Some other weirdo that cares about the same things you care about." It's easier than ever to connect and collaborate, and that is changing the way we approach our hobbies and interests.

These online "utterances" like short tweets or status updates increase our sense of ambient awareness. Thompson said that ambient awareness is the ability to be aware of the happenings in peoples' everyday lives without being physically present. Much like we pick up on subtleties through body language, these small utterances help us to understand how our friends are feeling.

Thompson also referenced the seminal 1973 work by Mark Granovetter, *The Strength of Weak Ties*. Granovetter found that people who found jobs heard about that job from what is known as a weak tie, such as an acquaintance or someone you know in passing. It used to be difficult to connect to weak ties, but now we live in a world where we have constant persistent contact with weak ties through social media.

Technology is also giving us new literacies, or new ways to gain knowledge about a specific subject. For example, as cameras become smaller and cheaper, it changes the kinds of videos we take and how we consume them. Live television recording technologies like TiVo and DVR give us the opportunity to pour over video frames and better analyze and think about content.

Another new literacy we have access to is data. Health trackers like the FitBit give users the ability to identify trends that were invisible before these tools were available. Thompson gave the example of his friend being able to track when he was due for a running injury, based on the data he collected about his performance.

As we explore new ideas, we have new ways to connect and collaborate over those ideas thanks to technology. This is the concept of connected thinking. The concept is similar to that of the "collective intelligence" explored by Pierre Levy who wrote, "No one knows everything, everyone knows something, all knowledge resides in humanity."

What Thompson wanted to get across is that the audience is no longer just one person, it is thousands of people connected together, thinking together. We see connected thinking influence tools such as Wikipedia and Quora, bringing people together to figure out a problem or criticize work.

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Jim Vanderhei and Sara Fischer, "How tech ate the media and our minds," *Axios*, 2/10/17

Let's face it: most of us are more distracted and more frazzled than ever. We are prisoners to our

phones: tweeting our every thought, or snapping our every emotion, or Facebooking our every fantasy, feeling or family moment. We scroll, click and swipe our days away, better connected than at any point in humanity — but not necessarily better informed.

We've been hit with more technological innovations than we are capable of responsibly handling.

Ten short years ago: The iPhone was born, Facebook was a small social network used mostly by college students, and there was no Snapchat, Instagram or Pinterest. Most people still relied on three network evening newscasts and a local newspaper, hand delivered, to be informed about current events. If you wanted to share a photo, you probably mailed it; if you wanted to share your opinion, you screamed it at the TV in your basement or wrote a letter to the editor, maybe by hand.

But then technology blew up — and blew (and took over) our minds. Now, every day there are:

1.2 billion web pageviews, *per Chartbeat*

Billions of Google searches, *per Google*

13.8 billion hours + of video shared on YouTube, *per Google*

13M audio/video calls made on Facebook Messenger, *per Facebook*

50 billion messages sent on WhatsApp, *per Facebook*

500 million Tweets sent, *per Twitter*

Our brains have been literally swamped and reprogrammed. On average, we check our phones 50 times each day — with some studies suggesting it could be three times that amount. We spend around 6 hours per day consuming digital media. As a result, the human attention span has fallen from 12 seconds to eight seconds since 2000, while the goldfish attention span is nine seconds. And we just mindlessly pass along information without reading or checking it. Columbia University found that nearly 60 percent of all social media posts are shared without being clicked on.

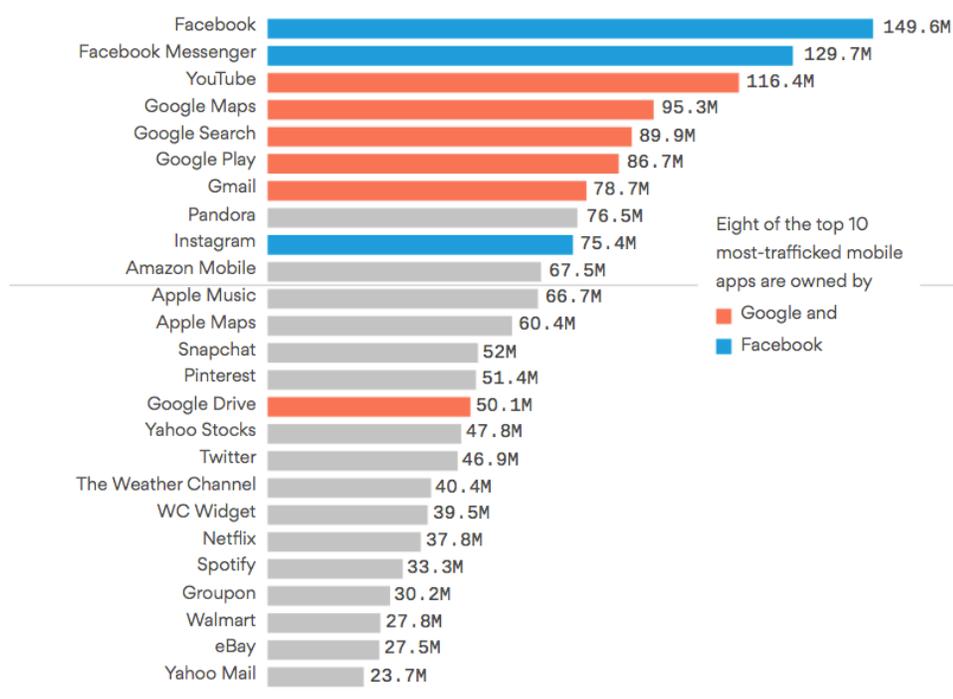
For better or worse, Google and Facebook are mostly to blame. Nearly 60% of our media-consumption time happens in mobile apps, and a majority of that traffic is owned by those two companies. (See below). This paradigm has destroyed the business model for news publishers, creating perverse incentives for publishers to generate as many clicks as possible, creating a "crap trap" — the deal media companies made with the devil to dumb things down (and lose credibility) by seeking the broadest reach. But, the house always wins: Facebook and Google now eat up almost two thirds of all ads and gobbled up 90 percent of all growth in media spend — while publishers perish.

And, at least for now, the more we know, or can see, the less we trust. Roughly 62% of U.S. adults get news on social media and 68% of people don't trust the news they see or read. Think about that: most people don't trust REAL news. The proliferation of fake news is almost certain to get worse, as we see left-leaning groups racing to adapt manipulative techniques that helped conservatives in 2016. Case in point: A 2016 BuzzFeed News analysis found that top fake election news stories generated more total engagement on Facebook than top election stories from 19 major news outlets combined.

This has created a conundrum: There is more good information than at any point in humanity, but it's harder than ever to find and trust. Almost every trend cited here is getting worse, not better. And so much of the power to change it rests in the hands of the few, mainly Facebook but also Google, Twitter and Snapchat. Some publishers are putting the emphasis on quality content, which can help. And others are moving fast to adapt serious news and information to better fit in these exploding off-platform ecosystems. But ultimately, the burden will fall on individual consumers to exploit what

should be the golden age of information by adjusting their own habits.

Top 25 mobile apps by unique visitors



Andi Horvath, How does technology affect our brains? *The Age*, June 4, 2015

When it comes to shaping our brains our environment plays a big role.

In fact it's the 'thinking' in response to our environmental experiences and interaction with our world that actually shapes our brains. You may have even observed children trying to swipe or pinch-enlarge a picture in a magazine.

So in short, the answer to the question, does technology change our bodies and our brains, is yes, technology affects our memory, our attention, what we focus on and our sleep cycles.

In particular, our sleep cycles are affected by bright light from screens tricking our brain into thinking it is still daylight causing sleep difficulties and that can affect our wellbeing.

We are in an era where we have outsourced our memory to Google, GPS, calendar alerts and calculators. But perhaps it's not about remembering the facts you have and more about how you use the information that matters.

If you ever feel you are forever forgetting things and therefore losing your mind, don't worry says Professor Michael Saling, neuropsychologist from the University of Melbourne and Austin Health. "I get at least one patient a week who is convinced that forgetting things like car keys or picking up children is the result of a serious brain condition or early Alzheimer's. The truth is the expansion of the information age has happened so fast, it's bringing us face to face with our brains' limitations. Just because our computer devices have perfect memories we think we should too.

"We've lost sight of the fact that forgetfulness is a normal and necessary phenomenon. We must keep pushing information out so it can deal with information coming in and if it gets overloaded we become forgetful," Professor Saling says.

Attention and focus in humans has been examined by brain scans. A study using neuroimaging of frequent Internet users showed twice as much activity in the prefrontal cortex of the brain compared to sporadic users.

This is the part of the brain that is used for short-term memory and quick decision-making. In situations where there is a flood of information, we have learnt to skim.

Are we becoming knee-jerk shallow thinkers or does the Internet actually sharpen our ability to scan information rapidly and efficiently?

To complicate things, for many of us, our jobs actually depend on the latter.

Baroness Professor Susan Greenfield's 2014 book *Mind Change* suggests that digital technology is changing our brains and as humans we are facing an unprecedented crisis concerning our individual identity, that is, who we are, what we do and how we behave. Greenfield expresses concern that social networking will displace the 'true self' with an exaggerated, ideal self. She also warns that digital technology demonstrably increases narcissism.

Associate Professor Cordelia Fine from the Melbourne Business School disagrees, and argues the notion of multiple social identities long predates social networking. She suggests the rise of narcissism is more complex, impacted more by the rise of self-interested neo-liberalism which sees market values directing all areas of modern life from education to individualism.

Even before digital technology, history had raised the questions about television and even machines possibly leading to the decline of civilization. Sociologist William Ogburn in 1934 spoke about the machine age natives who had lost connection with nature and tradition, and who were divorce prone.

Humans have always had a symbiotic relationship with technology. After all we humans designed our tools. But is there a better way to work with technology?

Associate Professor Frank Vetere, Director of the Microsoft Research Centre for Social Natural User Interfaces at the University of Melbourne, who researches human-computer interactions, sees a brighter future. His expertise is 'natural user interfaces' and his team works on new approaches to technologies that augment social interactions and social well-being.

"We have come a long way from how we interact with computers, that is indirectly with other people. We have gone from commands on a keyboard to a mouse to touch screens to Wii devices and more recently devices that detect your body movements and voice commands like the Xbox Kinect.

"We may be heading to a screen-free future. Our group draws on ideas and theories from psychology, anthropology, sociology and the social sciences to create and explore tomorrow's interactive mechanisms.

"Consider a contemporary scenario where parents are telling their children not to bring their mobile phone to the dinner table because we prefer to talk to each other. What if we rethink that scenario and encouraged people to bring their devices to the dinner table in a way that motivates social rapport, well-being and family harmony? This research is where engineering and the social sciences work together and it's very exciting," Professor Vetere says.

Our individual brains develop in early childhood and adolescence but can also change in adulthood as various areas develop, adapt, or deteriorate. There is truth to the phrases 'use it or lose it' and 'neurons that fire together wire together'.

When neurobiologists discuss changes in the brain they mean both the structure and function of nerve connections and changes in its complex biochemistry.

Professor Tony Hannan, a neurobiologist at the Florey Institute, says it's reassuring that the brain can be trained to rewire itself.

"It is this neuroplasticity that allows for rehabilitation which can be achieved with environment stimuli like exercise."
