

**Transcript for Professor Gernsbacher's Lecture Video  
"How is the Internet Affecting Our Attention?"**

We've all seen the dire proclamations.

**CLICK** - Nicholas Carr, author of the book, "What the Internet is doing to our brains," warns that the Internet QUOTE Shatters Focus and Rewires our Brain.

Simplicity blogger, Leo Babauta, writes that

**CLICK** - "I absolutely adore the Internet, but there's no doubt it has made us more distracted than ever."

**CLICK** - A 2012 Pew Research Center survey reported that while 75% of middle-school and high school advanced placement and National Writing Project teachers believe that while the internet has had a "mostly positive" impact on their students' research habits, an even larger percentage of those teachers,

87% think that the Internet is creating a QUOTE "easily distracted generation with short attention spans" UNQUOTE

**CLICK** – The University of Missouri, St. Louis campus newspaper claims that

**CLICK** – when it comes to the Millennial generation, who are persons born from the early 1980s to the turn of the millennium in the year 2000,

**CLICK** – multi-tasking with technology is as ubiquitous as Ugg boots and skinny jeans.

But what do the scientists say?

**CLICK** - Do they agree that the Internet is rewiring our attentional circuits,

**CLICK** - that Millennials are the reigning kings of multi-tasking, and

**CLICK** - that the Internet has made us more distracted than ever,

**CLICK** - No.

**CLICK** - No.

**CLICK** - Maybe.

To be sure, as Vishaka Muhunthan notes,

**CLICK - QUOTE** We are no strangers to panic over and speculation about the dangerous effects of future technology. UNQUOTE.

As I've discussed before, there were fears about writing, reading novels, riding bicycles, playing chess, accompanying movies with pre-recorded musical scores, listening to the radio, reading the newspaper, speaking on the telephone, writing with a ballpoint pen, using an eraser to correct errors, watching TV, and using pocket calculators.

Techno anxiety has been with us for centuries. [PAUSE]

**CLICK** – But is the Internet rewiring our brains? That depends on what you mean by rewiring. If you mean, does Internet use affect our brains, then the answer is a definitive yes. But as cognitive scientist Tom Stafford wisely notes,

“The truth is that everything you do changes your brain. Everything. Every little thought or experience” affects your brain. Using the Internet, watching television, having a cup of tea – or not having a cup of tea. Just thinking about tea affects your brain. As does not thinking about tea.

However, if the question about whether the Internet is rewiring our brains means whether our brains are evolving to be different because of our exposure to the Internet, the answer is a definitive no.

For example, there’s no scientific evidence that our attentional spans have decreased or increased over the past several decades.

**CLICK** - We know from many years of intelligence testing, reaching back as far as the 1920s, that our attentional capacity, as measured by one of the most standard of indices,

**CLICK** - hasn’t changed one bit over the decades. Our attentional spans have neither decreased nor increased over the past 85 years, including the past 15 years in which we so avidly engaged with the Internet.

**CLICK** – Similarly, using another standard measure of attentional capacity, the data again show that our attentional spans have neither decreased nor increased over the past 85 years.

**CLICK** – Furthermore, we know from research conducted here at the University of Wisconsin-Madison, that efforts to train attention, using, for example, Internet-based video games, usually result in only specific gains on the specific skill being trained.

**CLICK** - Applying that finding to a real world phenomenon, what that finding means is that while some of us might have gotten really good at quickly detecting

**CLICK** - the red flag that appears in the corner of our computer screens when we receive a new email message, it’s unlikely that attention skill of red-new-email-flag detection transfers to many other realms of visual attention.

**CLICK** - And more broadly, if the question of whether the Internet is rewiring our brains is asking whether our brains are evolving to be different because of our exposure to the Internet, the answer is also an unlikely, no.

**CLICK** - Consider the science and evolution of another human invention, a human invention that’s been around a heckuva lot longer than the human invention of the Internet, namely the human invention of

**CLICK** - Reading.

As Stan DeHayne explains in his book on brain mechanisms underlying reading, the process of reading, although used by humans for centuries, has not rewired the human brain. No new reading-specific circuits have evolved in our brains just to handle reading.

**CLICK** - Rather, the process of reading draws on several existing neural circuits, including those involved in visual perception, auditory perception, attention, and of course language.

If the process of reading, which has been around for centuries still hasn’t rewired our brains, it’s very unlikely that the process of using the Internet, which has been around for only a couple of decades has rewired our brains.

**CLICK** – But aren’t millennials, you know, those young people who are considered digital natives, really great at multi-tasking because they grew up with the Internet. Didn’t the Internet give them special multi-tasking powers?

Alas, the empirical answer to this question is also no. Millennials are usually no better at multi-tasking than are we Baby Boomers.

For example, in a study by Krampe and colleagues,

**CLICK** - participants were tested while single tasking, which was walking as fast as possible along a narrow track, or, while multi-tasking, which was walking as fast as possible along a narrow track, while generating exemplars of categories.

For instance, the participants might be given the category, vegetables, and the participants had to say aloud as many vegetables as they could while walking as fast as possible along a narrow track.

**CLICK** - The participants included 30 9-year olds, 30 11-year olds, 30 young adults, whose average age was 25, and 30 older adults, whose average age was 64.

**CLICK** – The researchers measured the maximum distance that each group could walk in 90 seconds. Let's look first at how well each of the four groups did when single-tasking, that is, when only walking without the additional task of having to generate exemplars of categories.

**CLICK** – 9-year olds walked an average of 120 meters,

**CLICK** – 11-year olds walked a significantly farther 130 meters,

**CLICK** - young adults walked an even farther 150 meters,

**CLICK** – and we old codgers walked only 115 meters, a distance equivalent to the 9 year olds.

Now let's see how well the four groups did when they had the added multi-task of generating exemplars of categories.

**CLICK** – For all four groups, adding in the multi-task reduced their distance, and the reduction in distance was proportionally similar for the four groups.

Multi-tasking was more difficult than single-tasking for all four age groups, and the millennials were not proportionally better at multi-tasking, even though they were better at single-tasking.

Other studies show the same effect: despite all the claims that millennials, by virtue of being digital natives are better multi-taskers, they really aren't. They're simply better at many single tasks.

Moreover, as reported by NPR,

**CLICK** – If you think you're good at multi-tasking, you're probably not. Studies comparing people's judgment of how well, or even how often, they multi-task to how WELL they actually multi-task, have shown either a lack of a relation between self-perception of multi-task skill and actual multi-task skill or the studies show a slight negative relation, such that persons who think they are better multi-taskers are actually worse multi-taskers.

**CLICK** – Furthermore, as demonstrated by Brooks' multi-tasking experiment, way back in the late 1960s, the more similar two tasks are, the more difficult they are to do together.

**CLICK** – Listening to the radio while reading is easier to pull off than texting while reading. [PAUSE] But texting while reading, particularly in the comfort of one's own home, is demonstratively safer than

**CLICK** - texting while walking, which is undoubtedly why some countries, including China, now have

**CLICK** – walking lanes marked specifically for texters.

OK, we've talked about

**CLICK** - Whether the Internet is rewiring our attentional circuits, and the answer is no.

**CLICK** - Whether Millennials are the kings of multi-tasking, and the answer is no, but what about the question of

**CLICK** - Whether the Internet has made us more distracted than ever before? To be sure, there have been fears of distraction in the wake of every technological invention.

Over 80 years ago, American historian, sociologist, and philosopher of technology Lewis Mumford opined,

**CLICK** - While the tempo of the day has been quickened by instantaneous communication the rhythm of the day has been broken: The radio, the telephone, the daily newspaper clamor for attention, and amid the host of stimuli to which people are subjected,

**CLICK** - it becomes more and more difficult to absorb and cope with any one part of the environment, to say nothing of dealing with it as a whole.

Even when I was growing up, 20 years after Mumford penned these words, these three technologies that Mumford derided were powerful sources of distraction.

**CLICK** – As for the newspaper, let me say that I adored my father. He was a fascinating man who passed away far too young. But I spent every morning at breakfast and every evening at dinner, looking across the table not at his face but at his newspaper.

**CLICK** – As for the telephone, although when I was growing up, most families had only one landline per house, many of us teenagers spent the bulk of our formative years talking endlessly to friend after friend after friend on the telephone as this stock photo illustrates.

**CLICK** – As for the radio, although our car radios had only five channels, two for FM and three for AM, that didn't stop us from constant channel hopping. There are studies showing that constantly changing the radio was just as much a distraction to driving as

**CLICK** – Later day fiddling with cassette tapes

**CLICK** – Reading maps, because we didn't have GPS.

**CLICK** – Lighting cigarettes, and several of the driving distractions that remain today, such as

**CLICK** – Yelling at kids

**CLICK** – And, sigh, putting on makeup. In fact,,

**CLICK** - over the past 60 years, automobile deaths have been declining steadily declining. Of course, one of the primary reasons for this continual decline in automobile deaths is the greater safety features built into contemporary cars, as well as stricter drinking while under the influence laws,

**CLICK** – but even during the past 15 years, during the rise of the Internet age, automobile deaths have continued to decline, despite the

**CLICK** – grave dangers from texting while driving. Do not. Do NOT text while driving.

But to return to our question,

**CLICK** - are there more weapons of mass distraction now than there were before the Internet? I honestly don't know. But what the research does show is that controlled distractions, that is taking short breaks every 20 or so minutes improves performance.

**CLICK** - And what the research shows is that taking short breaks by surfing the web, watching a funny YouTube or checking in on Facebook, improves productivity.

So, in answer to the question of how the Internet is affecting our attention, here is what we know.

**CLICK** - 1. Every technological invention has been feared to distract our attention and ruin our memories, if not our morals.

**CLICK** – 2. While it's true that everything we do affects our brains, it's unlikely that the Internet is rewiring our brains.

**CLICK** – 3. Because there's no scientific evidence that our attentional spans have decreased or increased over the past several decades.

**CLICK** – 4. Because specific efforts to train attention, using, for example, Internet-based video games, usually result in only specific gains on the specific skill being trained, and

**CLICK** – 5. Because other human inventions, such as reading, which have been around considerably longer, have not rewired the human brain.

Furthermore, despite frequent claims to the contrary,

**CLICK** – 6. Millennials are usually no better at multi-tasking than are Baby Boomers.

**CLICK** – 7. Millennials are simply better at many single tasks, but they are not proportionally better at multi-tasking.

**CLICK** - 8. People who think they are better at multi-tasking usually aren't.

**CLICK** – 9. The more similar two tasks are, the more difficult they are to do together, which explains why

**CLICK** – 10. Texting, which requires visual attention, and walking, which also requires visual attention are not good candidates for multi-tasking. For anyone.

**CLICK** – 11. And texting, which requires visual attention, and driving, which also requires visual attention are even worse candidates for multi-tasking. For everyone.

**CLICK** – Lastly, 12. Taking short, controlled breaks on the Internet doesn't harm attention, but rather improves attention.