

THE SHALLOWS

How the internet is changing the way
we think, read and remember



NICHOLAS CARR

Book The Shallows

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Nicholas Carr
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Recommendation

Business author Nicholas Carr enters Malcolm Gladwell territory with an insightful, far-reaching book of essays on how your brain works, how the Internet alters your perceptions and habits, and what the consequences of those alterations might be. Stretching from Aristotle to Google, Carr seeks to understand the magnitude of the change the Internet presents, and to gauge whether that change is for good or ill. He does not offer answers to his more provocative philosophical questions, preferring that the reader sort those out. But he frames these fascinating queries in detailed disquisitions on futurism, the creation of computing, the history of the written word and the evolution of science’s notions of the brain and how it functions. His relaxed writing style provides a companionable read, as if you were having a great conversation with a brilliant stranger. *BooksInShort* recommends this enjoyable, nourishing book to everyone who’s ever wondered how working on a computer might be affecting their lives and their brains.

Take-Aways

- The Internet alters the ways in which you think and how you take in knowledge.
- The human brain’s “plasticity” means it adapts, responds to repetition and adjusts to new tools, like reading, writing and web surfing.
- Reading books demands focused linear thinking, but reading Internet articles fragments how you process information.
- Your brain is hardwired for distraction; the more you’re distracted, the more distraction your mind craves.
- Reading printed text stimulates different neural zones than reading Internet material.
- Like the Internet, maps and clocks changed how people perceived space and time.
- The Internet enables superficial thinking, perfunctory reading and shallow learning.
- Studies show that Web viewers retain less information than readers of printed text.
- Memory no longer is necessary because technology makes information readily available.
- As the Internet takes over basic memory functions, the brain stops making connections on its own.

Summary

“The Dissolution of the Linear Mind”

Media prophet Marshall McLuhan, writing in 1964, detailed how “electric media” – radio, TV, telephones and movies – were breaking up people’s “linear minds,” ending forever the dominance of printed information. The human brain uses patterns and work habits based on that dominance. When shifts in media occur, users tend to focus on “content,” the information those media provide. Few pay attention to a particular medium itself, or how using that medium changes habits and perception. Yet the medium always is more significant than the information it conveys.

“In the long run, a medium’s content matters less than the medium itself in influencing how we think and act.”

The Internet provides an infinity of information. As you absorb that data, the Web alters the ways in which you think and take in knowledge. Some believe that the haphazard nature of the Internet renders books a thing of the past. Books offer a slower sense of time, deeper concentration and a more personalized experience. Such experiences produced the linear mind, the kind of thinking that moves consecutively from one idea to the next. Because of the Internet, that thought structure now seems dated.

“For the last five centuries...the linear, literary mind has been at the center of art, science and society.”

When the German philosopher Friedrich Nietzsche was going blind and could not see to write, he acquired one of the first typewriters. Using the machine led to a change in his writing style: He wrote in shorter bursts and simpler language. He noted, “Our writing equipment takes part in the forming of our thoughts.”

Brain “Plasticity”

In 1950, J.Z. Young, a British biologist, offered a revolutionary idea: that the brain might be constantly changing. Prior to this, science had held that the brain formed patterns that did not adapt. The Industrial Age viewed the brain as a machine – it worked in a specific way over and over. But modern research proves that the brain is

quite malleable; it creates patterns of usage depending on circumstances. For example, if someone goes blind, the neural zones that handled sight shut down sight-related activities to offer more space to tasks that complement sight, such as taste, touch and smell. The brain restructures itself constantly.

“The genius of our brain’s construction is not that it contains a lot of hardwiring but that it doesn’t.”

Further experiments determined that focus and practice – traits displayed in playing a musical instrument, for example – create changes in neural activity. When you employ a tool, be it a hammer, violin or computer, your brain comes to regard that tool not as something you hold in your hand, but as part of your hand and part of you.

“What the map did for space – translate a natural phenomenon into an artificial and intellectual conception of that phenomenon – another technology, the mechanical clock, did for time.”

An infinite number of synapses link “neurons together in a dense mesh of circuits” inside the human brain. Every time you do or think something, a neuron cluster “activates.” Neurons like repetition; they light up when faced with familiar tasks. Thus, activities can become habit. With repetition, connections between neurons increase in strength and density. Habit creates links – “cells that fire together wire together.”

“The oral world of our distant ancestors may well have had emotional and intuitive depths that we can no longer appreciate.”

“Tools of the Mind” Your brain functions mimic the tools that interpret your reality. For example, before maps, humans lived with deep connections to the natural world. As maps became more accurate and accessible, the brain paid less attention to topography, and the logical grid of a map became part of human thinking. Before clocks, people were more attuned to natural cycles as indicators of time’s passage. As clocks became ubiquitous, they created a new logical grid, which came to dominate human mental processes. Each new invention offers a new “intellectual ethic,” that is, “a set of assumptions about how the human mind works or should work.” That ethic usually is the least noticed but most important aspect of any new tool. New technology helps you do what you need to do, but it also always changes the thinking that accompanies the doing.

Evolution of the Written Word

Reading and writing changed human neural functioning. Appearing around 4,000 BC, Sumerian cuneiform and Egyptian hieroglyphics – each consisting of recognizable, metaphorical shapes that bore complex, abstract meanings – led to the formation of “crisscrossed” brain circuits that facilitated analytical thinking. In 750 BC, the Greeks created “the first complete phonetic alphabet,” and it changed the world: Its efficiency and economy of symbols made writing easy. A culture rooted in oral tradition thus shifted to one based on the written word. In an oral culture, memory is everything, because knowledge transmits only through speech. In a literary culture, the part of the brain used for memory can surrender its task of holding all cultural history, thus freeing neural space for practical short-term uses or abstract thought, art and invention.

“The written word liberated knowledge from the bounds of individual memory and freed language from the rhythmical and formulaic structures required to support memorization and recitation.”

The earliest books essentially were bound scrolls. Reading and writing followed the form of the scroll – an unwinding sheet with no space between words and no punctuation. Only by reading this “*scriptura continua*” aloud did the continuous stream of unbroken written words, which mimicked speech patterns, make sense to the eye and ear. This reading method engaged the brain in different ways, but as literacy spread, private reading became necessary. To read to oneself meant long periods of focused concentration. Such activity may seem like a natural state, but it is not. The brain is wired to be constantly aware of its environment. Connecting to the written word meant training the brain to tune out the rest of the world.

“The natural state of the human brain...is one of distractedness.”

The world changed again when Johannes Gutenberg manufactured the first printing press in 1445. Being able to print quickly meant that books became cheaper and more widely available. More books meant increased literacy, and increased literacy meant that writings beyond the classics or the Bible found a greater readership. That mass audience learned to spend time in focused concentration, which for the next five centuries dominated the intellectual ethic. People found and shared information through books – linear, portable objects containing transferable knowledge.

“Disruption”

By 2009, adults in North America were spending twice the amount of time online – 12 hours a week – than they were in 2005; children were online 11 hours a week, up 60%. Yet for both groups, web surfing did not take time away from watching television. So some activity had to cede its place to the Web. For many, that activity was reading print material – books, newspapers and magazines. One proof of this decline is that libraries have become places where computers and Internet access matter more than books. Most newly designed libraries reflect this change, with computers positioned in the middle of the space and books located off to the side.

“To read a long book silently required an ability to concentrate intently over a long period of time, to ‘lose oneself’ in the pages of a book.”

As attention shifts from the singularity of books to the blur of digitized material, the differences among media matter less and less. All become conveyances of visual information, whether words, still images or moving pictures.

Putting hyperlinks into documents breaks up their linearity. Reading and clicking on a hyperlinked article is an entirely different activity than immersing yourself in the unbroken form of a book. As you leap from link to link, the context of the information you take in matters less. All this fracturing means disruption. The solace for disruption often can be more disruption. Your brain likes distraction, and it likes feeling connected. The more you search the Web and the more you seek a connection between one bit of information and another, the more disrupted and the happier your brain becomes, even as your powers of concentration become more disjointed. A printed book works against this seductive fragmentation. A book is a single, limited object with but one purpose. It offers scant competition against the infinity of the Internet.

“What does seem to be decreasing as Net use grows is the time we spend reading print publications.”

“The Juggler’s Brain” The Internet takes its place among the history of “tools that have helped mold the human mind.” The Web engages sight, touch and sound, often all at once. It provides an instant loop of “responses and rewards.” Once connected, the brain wants more connection and, in fact, it succumbs to anxiety if it feels disengaged. The Internet demands and grabs your concentration, only to fragment it. The brain contentedly leaps from one distraction to the next.

“Most Web pages are viewed for ten seconds or less.”

Research indicates that the Internet, like books, profoundly alters human mental patterning. Areas of the prefrontal cortex that are dormant in non-Web users show massive activity among experienced Internet surfers. Web searching produces brain patterns quite unlike those caused by reading printed text. Studies show that readers of printed material have superior comprehension and retention; they “learn more” than those who read hyperlinked text.

“The offloading of memory to external data banks doesn’t just threaten the depth and distinctiveness of the self. It threatens the depth and distinctiveness of the culture we all share.”

Internet activity is, on one level, healthy for the brain. All that connecting, dealing with fragmentation, navigating and quickly scooping out particles of information may wreck your ability to concentrate for any length of time, but reading online keeps your brain active and keen. However, web activity upsets certain paradigms of memory. Short-term memory becomes filled with all the minutiae of the web experience, making it more difficult to move necessary working knowledge into long-term memory, which is the transfer that creates “depth of...intelligence.” More stuff pouring into your brain does not make you smarter – it just overloads you. Parsing out what matters and what does not occupies neural space that you could direct to retention and interpretation. For example, in an experiment, subjects who watched newscasts with text crawls on the bottom of the screen retained far less about the news reported than participants who watched screens without text feeds. The latter group could focus on and retain what they saw.

“An Interruption System”

The Internet breaks up focus, making it impossible to pay meaningful attention. It creates an addiction to the constant flow of the new, even when the new offers little of value. The desire for the latest is so strong that few people actually read online. Research shows that Internet users whip their eyes around segments of a web page, scanning and moving on, seeking fragments out of fragments, but seldom attempting to absorb the whole. “Skimming is becoming our dominant mode of reading.”

“Outsource memory, and culture withers.”

Multitasking makes solving problems more difficult. The distraction inherent in multitasking forces the brain back to its most familiar pathways, and those often are the least creative modes of thinking. The brain devolves to its most accessible ideas, hindering innovation.

“The Art of Remembering”

Socrates maintained that the more people wrote, the less they would need their memories. Anything they couldn’t remember, they knew they could find in something someone else had written. The Gutenberg press and its democratization of the written word reduced memory capability even more.

“The brain – and the mind to which it gives rise – is forever a work in progress.”

New media, that vast index of pretty much everything, accelerated the process of memory reduction. Prior to cell phones, everyone carried several phone numbers in their heads. Now, with all numbers a touch away, few people use the mental energy required to recall them. Philosopher William James believed that “the art of remembering is the art of thinking.” But the Internet has permanently altered how memory, and thus thinking, works. Memory depends on a deep consolidation of information. A perfunctory review – the only kind the Web allows – almost ensures that information will be forgotten. With the Internet as the go-to cultural repository, memory becomes “outsourced.” Culture cannot flourish when its participants don’t remember its history or traditions.

Limitations and Possibilities

“Every tool imposes limitations even as it opens possibilities.” The brain becomes one with a tool; as the tool of the Internet takes over many basic brain functions, the brain stops making connections on its own. And as distraction increases, the capacity for empathy and intimacy decreases. The Internet injects “frenziedness” into thinking, and the brain likes it. The great threat is that Internet intelligence will flatten human intelligence. But nobody’s turning away from the Web just yet; nobody’s turning back the clock.

About the Author

Nicholas Carr, a former executive editor of *Harvard Business Review*, wrote *The Big Switch: Rewiring the World, from Edison to Google*.
