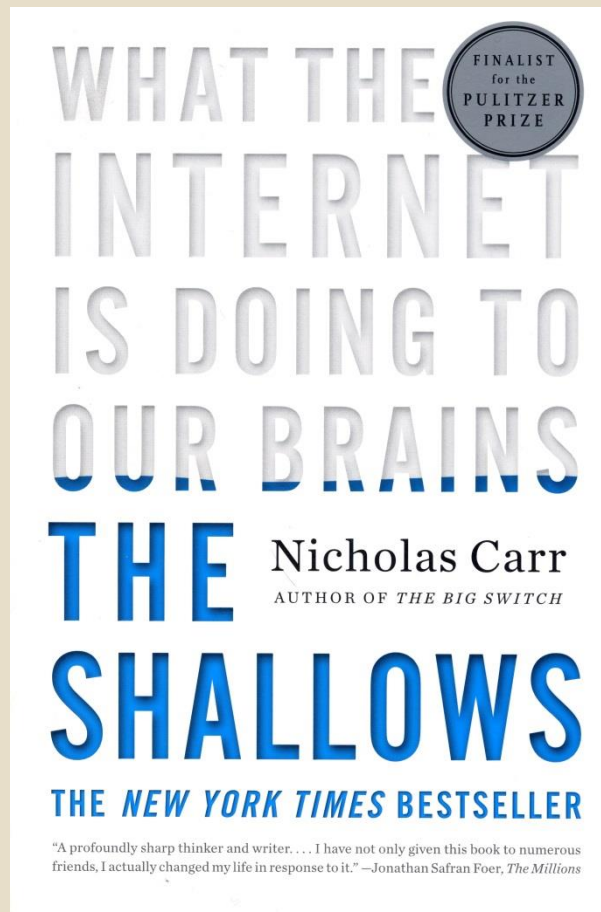


The Shallows:

What the Internet is Doing to our Brains

by: Nicholas Carr



Presented by:

- Elizabeth De Jong
- Norma Duke

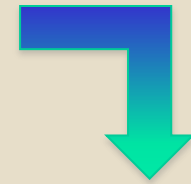
Nicholas Carr



- Reviews technology, culture, and economics
- *Does IT Matter* (2004)
- *The Big Switch: Rewiring the World from Edison to Google* (2008)
- “*Is Google Making Us Stupid?*” *Atlantic Magazine*, 2008, July/August
- *The Shallows: What the Internet is Doing to Our Brains* (2010); Pulitzer Prize Finalist in general non-fiction (2011)
- Columnist, author: 67 articles, in 21 different publications
- Editorial Board of Advisors for *Encyclopedia Britannica*
- B.A. Dartmouth College; M.A., in English and American Literature and Language, Harvard University

Carr's Personal History

- Mac Plus; \$2000 (1986)
- Word, Excel, Hypercard
- Paper and pencil; on-screen editing
- Modem; AOL (1990)
- “...trapped, not unhappily, in the ‘upgrade cycle’...”
- Netscape browser (1995)
- Web 2.0 (2005); social networking



Organization of Presentation

- Norma

- Prologue: The Watchdog and the Thief
- Chapter 01: Hal and Me
- Chapter 02: The Vital Paths
- ⑩ →
- Chapter 08: The Church of Google
- Chapter 09: Search, Memory
- Chapter 10: A Thing Like Me
- Other Sources

- Elizabeth

- Chapter 03: Tools of the Mind
- Chapter 04: The Deepening Page
- Chapter 05: A Medium of the Most General Nature
- Chapter 06: The Very Image of a Book
- Chapter 07: The Juggler's Brain
- ⑩ ←

Prologue: The Watchdog and the Thief

- Marshall McLuhan: *Understanding Media: The Extensions of Man* (1964)
- Prophesied dissolution of linear mind; “*The medium is the message.*”
- “When people start debating (as they always do) whether the medium’s effects are good or bad, it’s the content they wrestle over.”
- “...medium’s content matters less than the medium itself in influencing how we think and act...”
- “The content of a medium is just ‘*the juicy piece of meat carried by the burglar to distract the watchdog of the mind.*’” (Carr, quoting McLuhan)

Chapter 01: HAL and Me

- Stanley Kubrick (1968)
- HAL9000; “I can feel it.”
- Get fidgety, lose the thread, begin looking for something else to do...
- Deep reading has become a struggle
- “Once I was a scuba diver in the sea of words. Now I zip along the surface like a guy on a Jet Ski.”
- Maybe I’m an outlier...?



Advantages are Real

- Nicholas Carr: uses the Web – a lot!
- Clive Thompson: “The perfect recall of silicon memory can be an enormous boon to thinking.”
- Scott Karp: “...we can’t yet recognize the superiority of this networked thinking process because we’re measuring it against our old linear thought process...”
- Philip Davis: “More connections to documents, artifacts, and people means more external influences on my thinking and thus on my writing.”
- “...silly...like sewing your own shirts or butchering your own meat.”

Beware...

- “For the last five centuries, ever since Gutenberg’s printing press made book reading a popular pursuit, the linear, literary mind has been at the center of art, science, and society.”
- nGenera study: 6000 members of “Generation Net”; affected the way they absorb information; eye movements while reading a page
- Katherine Hayles: Students not reading whole books (literature degrees)
- Bruce Friedman: “I can’t read *War and Peace* anymore”.

Scott Karp

- **Scott Karp: “What if I do all my reading on the web not so much because the way I read has changed, i.e. I’m just seeking convenience, but because the way I THINK has changed?”**



Chapter 02: The Vital Paths

- Friedrich Nietzsche (1882);
Danish Malling-Hansen
Writing Ball
The writing ball is a thing like
me: made of iron
Yet easily twisted on journeys.
Patience and tact are required in
abundance,
As well as fine fingers, to use us.
- *“Our writing equipment takes
part in the forming of our
thoughts.”*



Historic Viewpoint

- Sigmund Freud: neurophysiologist; many cells & contact barriers (1895)
- William James: psychologist; “seems endowed with a very extraordinary degree of plasticity” (1890)
- Santiago Ramon y Cajal: Spanish physician, neuroanatomist (Nobel Prize, 1906)
 - “In the adult brain centres, the nerve paths are something fixed, ended, immutable. Everything may die, nothing may be regenerated.” (1913)
- Industrial Age; brain as a mechanical contraption
- “Since the brain could not change, human nature, which emerges from it, seemed necessarily fixed and unalterable, as well. (Norman Doidge, 2007)

Michael Merzenich

- Doctorate in physiology from Johns Hopkins (1968)
 - 2001: A Space Odyssey (1968)
 - Neil Armstrong, Edwin “Buzz” Aldrin, Jr.: Apollo 11 (July 20, 1969)
- Mapped six monkeys’ hands; severed sensory nerve; allowed heal; signals crossed
- Few months later...gone!
- “These results are completely contrary to a view of sensory systems as consisting of a series of hardwired machines.” (1983)



Eric Kandel

- Nobel Prize (2000)
- Sea slug: *Aplysia californica*
- Touched gill, lightly, 40x
- “Showed dramatically that synapses can undergo large and enduring changes in strength after only a relatively small amount of training.”
- Empiricists: learn via experience
- Rationalists: built-in templates



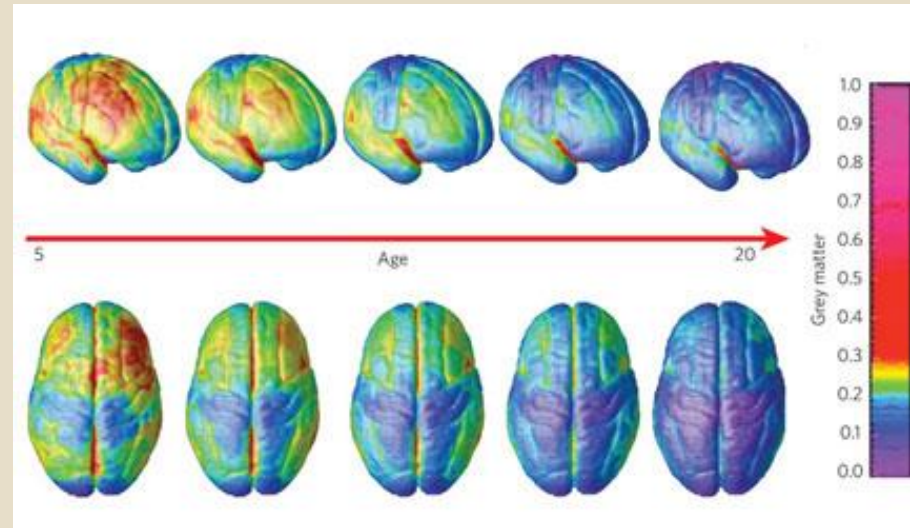
Michael Bernstein & Edward Taub

- Edward Taub: behavioral neuroscientist, University of Alabama at Birmingham
- Michael Bernstein: eye surgeon
- Increasingly severe stroke over few days in hospital; age 54
- Traditional program of physical therapy; left hand crippled, left leg needed cane
- Routine tasks performed repeatedly
- Coax neurons and synapses to reconnect



Genius of the Brain...

- Mark Hallett, head of Medical Neurology Branch of NIH: “We have learned that neuroplasticity is not only possible but that it is constantly in action.” (2005)
- Nicholas Carr: “The genius of our brain’s construction is not that it contains a lot of hardwiring but that it doesn’t.” (2010)



How Does the Teenage Brain Work?

Powell, K. (2006). *Nature* 442, 865-867.

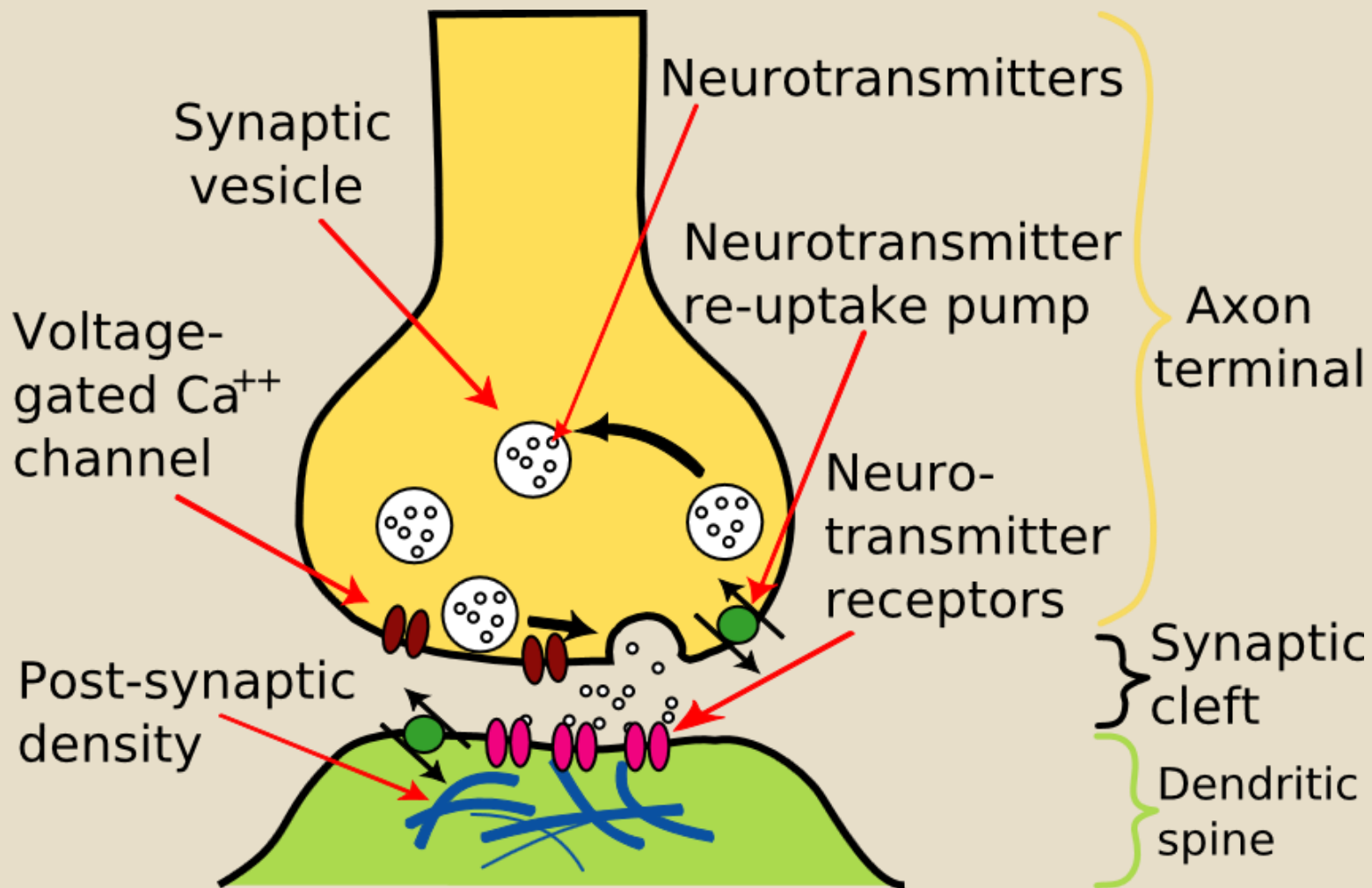


Diagram of a Nerve Synapse

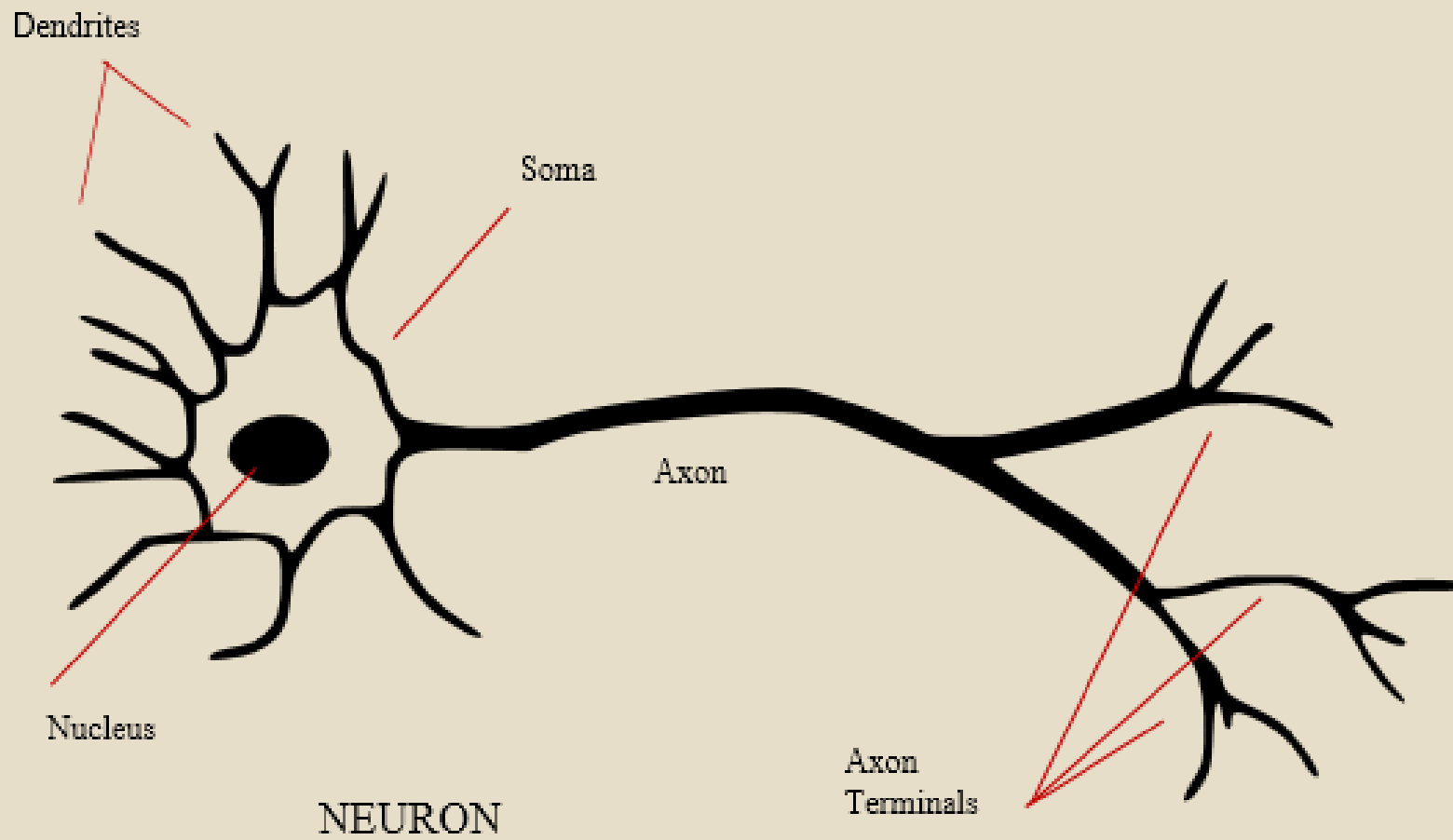


Diagram of a Neuron

There are times...



Chapter 3 Tools of the Mind





www.shutterstock.com · 269743

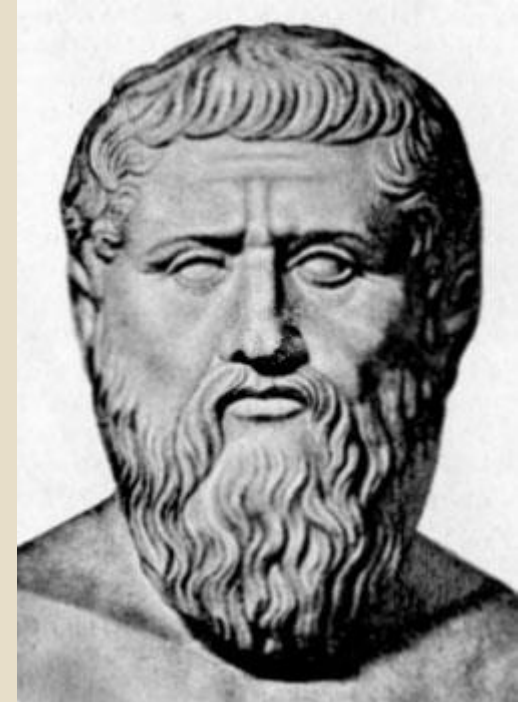
Intellectual Technology



- Examples-typewriter, globe, book, newspaper, library, computer, internet
- Theories of thought
 - Determinists vs. Instrumentalist



- Our interaction with technology
- Changes over the years
- Historical record of writing
 - Hieroglyphics-written
 - Plato-spoken



Chapter 4 Deepening Page

- History of the Written Word
- Sumerians, Egyptians
- Style
- Educational structure
- Shift



Chapter 5 Medium of the Most General Nature

- Universal Machine
- Technology advancements

- Internet Usage Comparison

2005 **Adults**

6 hrs. per week

2009

12 hrs. per week

Children

11 hrs. per week



2009 Average American rec'd

400 texts per month

Average teen 2,272 text per month



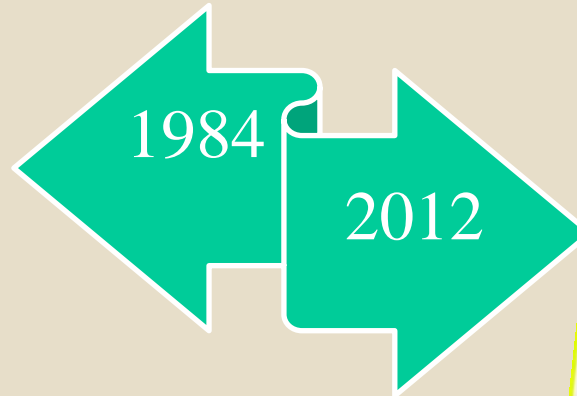
TV & Internet Habits

- 2008-2009 TV viewing average 153 hrs. a month
- 2006 study TV & Internet overlap
 - 42% of avid TV fans spends 30 hrs. online
- 2009 Ball State Study
 - 8.5 hrs. viewing TV, computer screen or mobile phone often at same time.



- 2008 Adweek Magazine Study
 - Observed 4 typical Americans, no print media consulted.

- Print usage down
- “old” technology loses cultural impact
- Access methods changing, so is our understanding
- Influences depth of understanding & degree of attention
- Presentation styles change to accommodate



Good Housekeeping May 1955

Housekeeping Monthly 13 May 1955



Advertising Archives

Housekeeping Monthly 13 May 1955

- Gather up schoolbooks, toys, paper etc and then run a dustcloth over the tables.
- Over the cooler months of the year you should prepare and light a fire for him to unwind by. Your husband will feel he has reached a haven of rest and order, and it will give you a lift too. After all, catering for his comfort will provide you with immense personal satisfaction.
- Prepare the children. Take a few minutes to wash the children's hands and faces (if they are small), comb their hair and, if necessary, change their clothes. They are little treasures and he would like to see them playing the part. Minimise all noise. At the time of his arrival, eliminate all noise of the washer, dryer or vacuum. Try to encourage the children to be quiet.
- Be happy to see him.
- Greet him with a warm smile and show sincerity in your desire to please him.
- Listen to him. You may have a dozen important things to tell him, but the moment of his arrival is not the time. Let him talk first - remember, his topics of conversation are more important than yours.
- Make the evening his. Never complain if he comes home late or goes out to dinner, or other places of entertainment without you. Instead, try to understand his world of strain and pressure and his very real need to be at home and relax.
- Your goal: Try to make sure your home is a place of peace, order and tranquillity where your husband can renew himself in body and spirit.
- Don't greet him with complaints and problems.
- Don't complain if he's late home for dinner or even if he stays out all night. Count this as minor compared to what he might have gone through that day.
- Make him comfortable. Have him lean back in a comfortable chair or have him lie down in the bedroom. Have a cool or warm drink ready for him.
- Arrange his pillow and offer to take off his shoes. Speak in a low, soothing and pleasant voice.
- Don't ask him questions about his actions or question his judgment or integrity. Remember, he is the master of the house and as such will always exercise his will with fairness and truthfulness. You have no right to question him.
- A good wife always knows her place.

The good wife's guide

- Have dinner ready. Plan ahead, even the night before, to have a delicious meal ready, on time for his return. This is a way of letting him know that you have been thinking about him and are concerned about his needs. Most men are hungry when they come home and the prospect of a good meal (especially his favorite dish) is part of the warm welcome needed.
- Prepare yourself. Take 15 minutes to rest so you'll be refreshed when he arrives. Touch up your make-up, put a ribbon in your hair and be fresh-looking. He has just been with a lot of work-wear people.
- Be a little gay and a little more interesting for him. His boring day may need a lift and one of your duties is to provide it.
- Clear away the clutter. Make one last trip through the main part of the house just before your husband arrives.

Good Housekeeping April 2010

goodhouse



The Look

MAKEOVERS MADE EASY for Less



1 SIGN LANGUAGE
Skip scouring flea markets, and pick up this oversized (not overpriced) steel sign from Retro Planet.com (\$119)

2 BLUE-LIGHT SPECIAL
Illuminate your room with one (or a pair) of these sleek glazed-earthenware stunners from Crate & Barrel (\$129 each)

3 CHAIR FLAIR
Statement-making wing chairs in a clementine shade (Brohyll, \$759) look bespoke with the DIY addition of upholstery tacks at the edges (Jo-Ann, \$1.49 for 24)

4 AMAZING VASE
It may look heirloom-quality, but at just \$41, this Italian Spode vase from The Bowl Company will leave you with cash to fill it with buds

5 WILD SIDE
Trust your animal instincts: West Elm's zebra rug (\$279 for 5' x 8'), in espresso- and ivory-colored wool, offers a creative take on staid black-and-white stripes

This **PERSONALITY-PACKED SITTING AREA** doesn't play it safe. But bold can be beautiful when smartly styled: Curvy orange chairs with nail-head trim, a graphic vintage sign, and animal-print accents, plus pops of contrasting cobalt, prove that sometimes *more* is more

Photographs, from left: Matthew Hillenat, PHILIP FREEMAN/STUDIO D (sign, tacks, vase, rug)

SHOPPING DETAILS, page 224 101

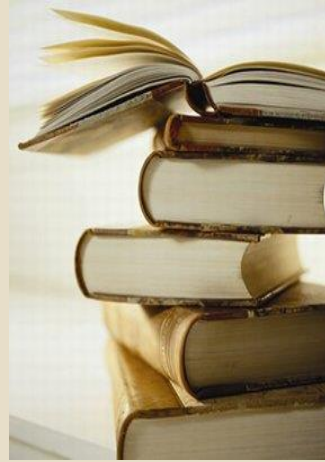
- Magazines, newspapers shorter articles with more graphics, less text.
- Decreasing newspaper circulation
- TV viewing-crawler
- Cable TV viewing multiple channels at same time
- 2009 National Symphony tweets during performance
- NY Philharmonic & Indianapolis Orchestra encouraged audience to vote on encore via text



Chapter 6

Image of a Book

- At time of book publication digital books not as popular.
- As of May, 2011 Ebooks outsold print



- First Kindle 2007
- Newsweek called Kindle “cultural revolution”
- NY Times Book Review “seductive white gizmo”



Future of Reading Books



- WSJ said the Kindle “can help return to us our attention spans and extend what makes books great: words and their meaning.”
- Failure to see how a change in a medium’s format also changes its content.
- Senior VP of Harper Collins “we need to take advantage of the [Kindle] medium and create something dynamic...”

Writing Style Changes

- 2001 Japanese “cell phone novels”
- By 2007, top 3 Japanese novels were written on cell phones.
- Vooks
- Social media incorporated into digital readers.
- Traditional books designed for attentive reader
- Books are still common place, but interaction methods altered.
- Contemplative reading is becoming rarer.



Chapter 7 The Juggler's Brain

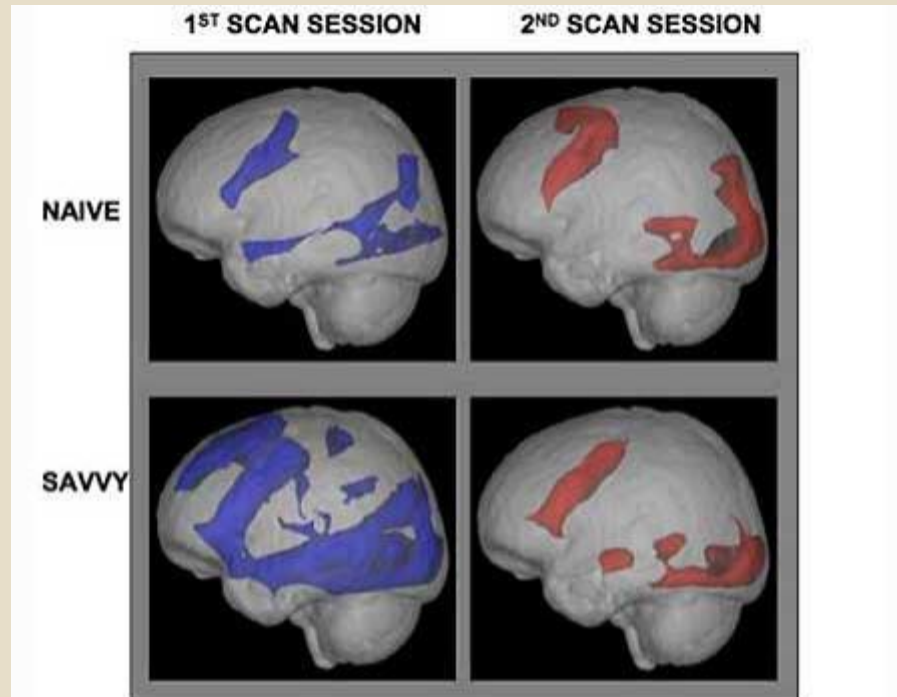


- Science of Neuroplasticity-what goes on in the brain
- The internet's impact on the mind.
- Research indicates consistent Net activity alters brain.
- “Internet seizes our attention only to scatter it.”

(Pg. 118)

Extensive Brain Studies

- 2008 UCLA study (2008) brain response to Net use.
- Brain scans experienced web surfers vs. novices.



- Novices 1 hr. per day on line.
- Within 6 days brain scans similar to heavy Net users.

Digital documents vs. paper

- Hypertext increased cognitive load weakening comprehension.
- 1989 study hypertext readers clicked through pages instead of reading carefully.
- 1990 experiment hypertext readers often could not remember what they had read

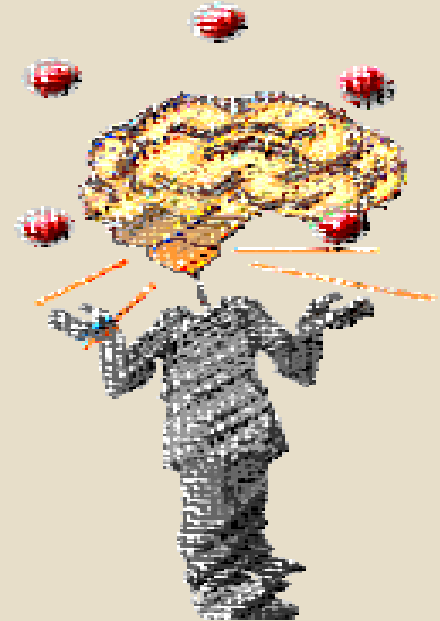


Comprehension and Multi-media presentation

- Study for Media Psychology in 2007
- Comparison of text presentation vs. multi video visual presentation.
- Text viewers scored higher, saying they found presentation, multi media version said they didn't learn anything.
- Cornell & Kansas State studies found more distractions = less memory.



- Pictures and audio enhance learning
- Brain uses different and separate means of processing
 - hearing
 - seeing
 - effects focusing ability.
- Example: Constant email checking.
- 2006 study
 - Net users skim text
 - Most web pages are viewed 10 seconds or less.
 - How do users read on the web?
 - Conclusion: They don't.



- 2003 Ziming Liu, professor at San Jose University
 - impact of digital documents on reading
 - subjects well educated people (engineers, scientists, teachers, grad students)
 - reading habits changed in 10 years.
 - 85% reading more digital documents, 81% said they were scanning & browsing
 - 82% reported more non-linear reading. Only 27% indicated that there in-depth reading increased, 45% said it was declining
 - Conclusion more topics explored, but at superficial level and hyperlinks distracted people from reading and thinking deeply
 - People still reading, but they read differently today



- Benefits of Net usage
- Better hand-eye coordination, reflex response, and processing of visual cues.
- 2003 Nature study & video gaming
 - After 10 days of play spatial reognition skills.
 - Conclusion video gaming “capable of radically altering visual attention processing”

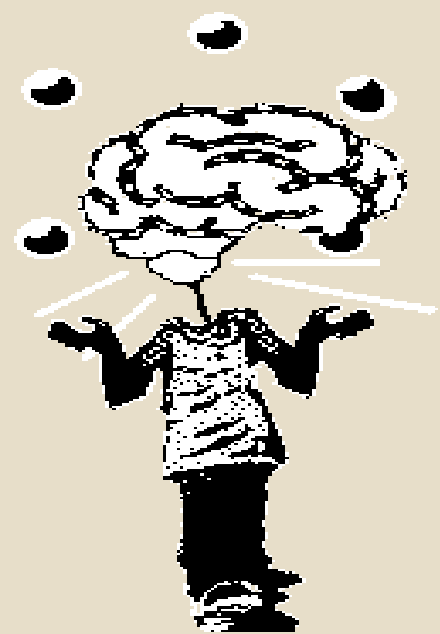


- Benefits

- Increased evaluation skills
- Increased working memory
- Increased workplace value (because job depends on our ability to connect quickly)



- Problems
- Jordan Grafman, head of Cognitive neuroscience unit at the National Institute of Neurological Disorders and Stroke believes that “improving our ability to multitask actually hampers our ability to think deeply and creatively.”
- In 2009 Science article reviewed
 - 50 studies on the effects of media types on intelligence and learning ability.
 - Conclusion “every medium develops some cognitive skills at the expense of others.”



- 2009 Stanford Study
- Heavy media multi-taskers vs relatively light multi-taskers.
- Heavy multi-taskers were much more easily distracted & had less working memory and lower concentration levels.





Technology & typical family outing

Chapter 08: The Church of Google

- Frederick Winslow Taylor
- Midvale Steel, Philadelphia (1878)
- Machine shop laborer to machine shop foreman; research director, chief engineer of works
- Realized men on line were not working to full potential
- Broke each job down into sequence of steps; created precise instructions
- Employees grumbled, no creativity...but profits soared



Neil Postman

- *Technopoly* (1993)
- Taylorism founded on six assumptions:
 - Primary goal of human thought and labor is efficiency
 - Technical calculation superior to human judgment
 - Human judgment cannot be trusted
 - Subjectivity obstacle to clear thinking
 - What cannot be measured either does not exist or is of no value
 - The affairs of citizens are best guided and conducted by experts



Larry Page and Sergey Brin

- Founders of Google (1995-1996)
- Larry Page: links on Web pages analogous to citations in academic papers; signify value
- Not all links created equal
- Authority of Web page gauged by number of incoming links
- The greater the authority of a Web page, the greater the worth of its outgoing links
- Database of all links on Web
- Sergey Brin; math prodigy



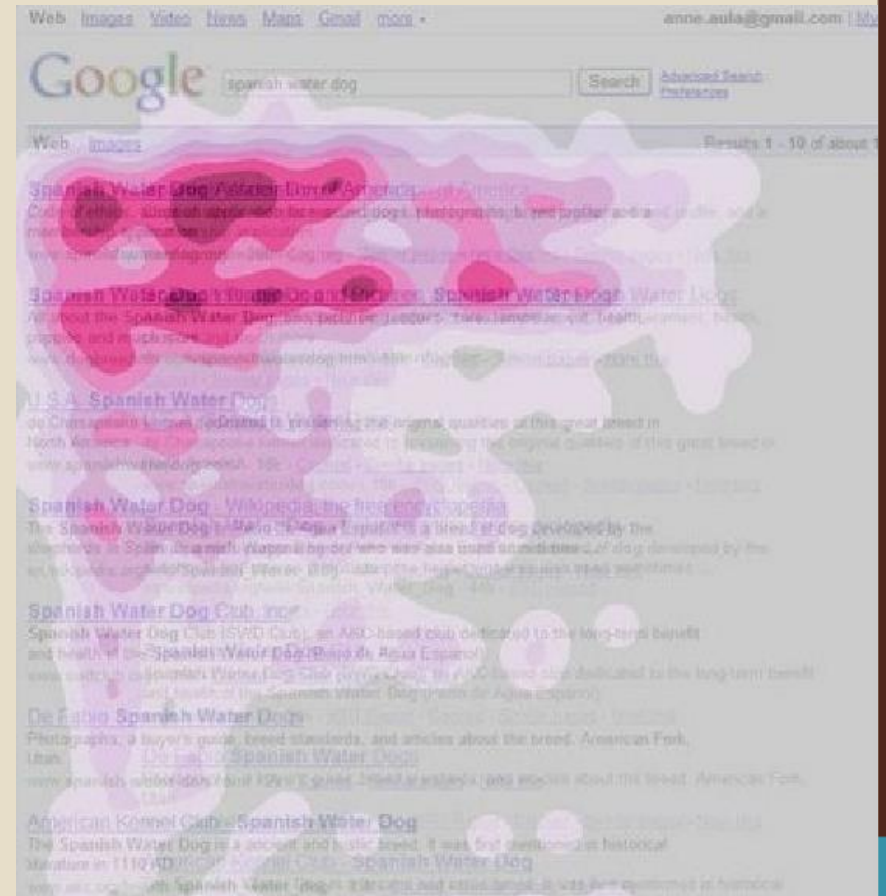
Googleplex

- “Googleplex is the Internet’s high church, and the religion practiced inside its walls is Taylorism.” (Carr; page 150)
- Founded on science of measurement; try to quantify everything
- Way sites look and operate; how long users stay on a page, way they move cursor, what they click on, what they don’t click on, where they go next
- Volunteers for eye-tracking



Google Tracking Your Eyes...

- “Our User Experience Research team has found that people evaluate the search results page so quickly that they make most of their decisions unconsciously.”
- “We use eye-tracking equipment in our usability labs. This lets us see how our study participants scan the search results page, and is the next best thing to actually being able to read their minds.”
- Anna Aula, Kerry Rodden



Funding Google

- Venture capitalist (1998)
- Decided to auction advertising space; modest compromise of ideals (2000)
- AdWords: two criteria
 - Size of bid
 - Frequency of user clicks
- Ensured relevance to topics of searches
- More clicks would result in more prominence on future pages
- Advertisers paid Google by click; revenues soared...



Google's Search Engine Success

- Earlier search engines got clogged with data as Web expanded
- Google's engine produces better results as Web expands; more sites and links lead to more precisely classified pages; ranks
- Increased traffic allows collection of more behavioral data
- Invested billions of dollars
- Shapes our interaction with content



Irene Au

- Head of User Experience;
Google
- “Our goal is to get users in and out really quickly. All our design decisions are based on that strategy.”
- Faster usage means more opportunities for Google to collect information about us, as the user, and to feed us advertisements
- Advertisements most likely to grab our attention



Impact of Social Networking

- Quality of page now only one of 200 considerations
- Google identifies new or revised Web pages much more quickly
- Checks popular sites every few seconds; skews results to favor newer over older
- Can bypass “quality” entirely
- Diversification of Google
- Digitize ever more types of information, move that onto Web, feed database, classify and rank; snippets (with ads...)



The Machine in the Garden

- Leo Marx (1964)
 - Machine: efficiency of information exchange
 - Garden: enlightenment...contemplation, introspection
- “The development of a well-rounded mind requires both an ability to find and quickly parse a wide range of information and a capacity for open-ended reflection.”
- “The problem today is that we’re losing our ability to strike a balance...”
- Carr, page 168



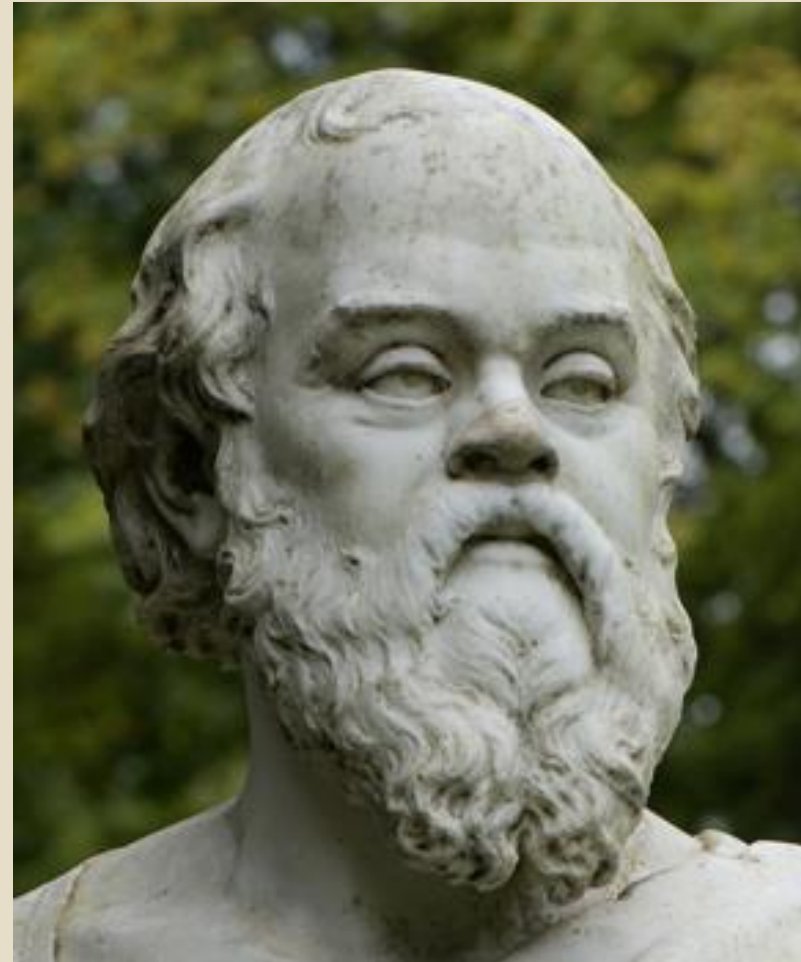
Things I Have Left Out...

- All discussion of Google Books
- “For Google, with its faith in efficiency as the ultimate good and its attendant desire to get users in and out really quickly, the unbinding of the book entails no loss, only gain.” (Carr, page 165)
- Larry Page: (2007); “...your DNA is about 600MB, compressed; much smaller than Linux or Windows; your program algorithms probably aren’t that complicated; probably more about overall computation...”
(paraphrased)



Chapter 09: Search, Memory

- “Socrates was right. As people grew accustomed to writing down their thoughts and reading the thoughts others had written down, they became less dependent on the contents of their own memory.”
- “But that wasn’t the whole story...”
- Carr, page 177



Desiderius Erasmus

- Dutch humanist; *De Copia* (1512)
- Stressed the connection between memory and reading
- Recommended that every reader keep a “commonplace” notebook, for recording memorable quotations...organized by subject, appropriate sections



Twentieth Century...

- Educators banned memorization from classroom; viewed as barrier to imagination, waste of time
- “Net quickly came to be seen as a replacement for, rather than just a supplement to, personal memory.” (Carr, page 180)
- Don Tapscott: “Why should we spend agonizing hours in school memorizing long passages or historical facts when you can look them up in an instant?”



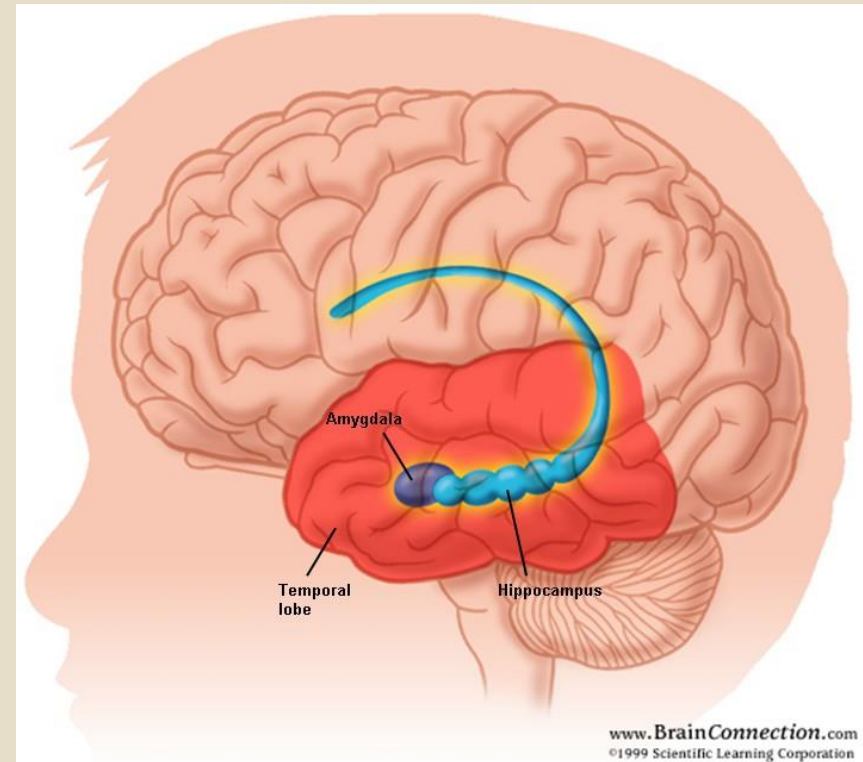
Back to Eric Kandel...

- ...experiments on *Aplysia californica* sea slugs...
- “We could see for the first time that the number of synapses in the brain is not fixed – it changes with learning!”
- “The fact that a gene must be switched on to form long-term memory shows clearly that genes are not simply determinants of behavior but are also responsive to environmental stimulation, such as learning.”



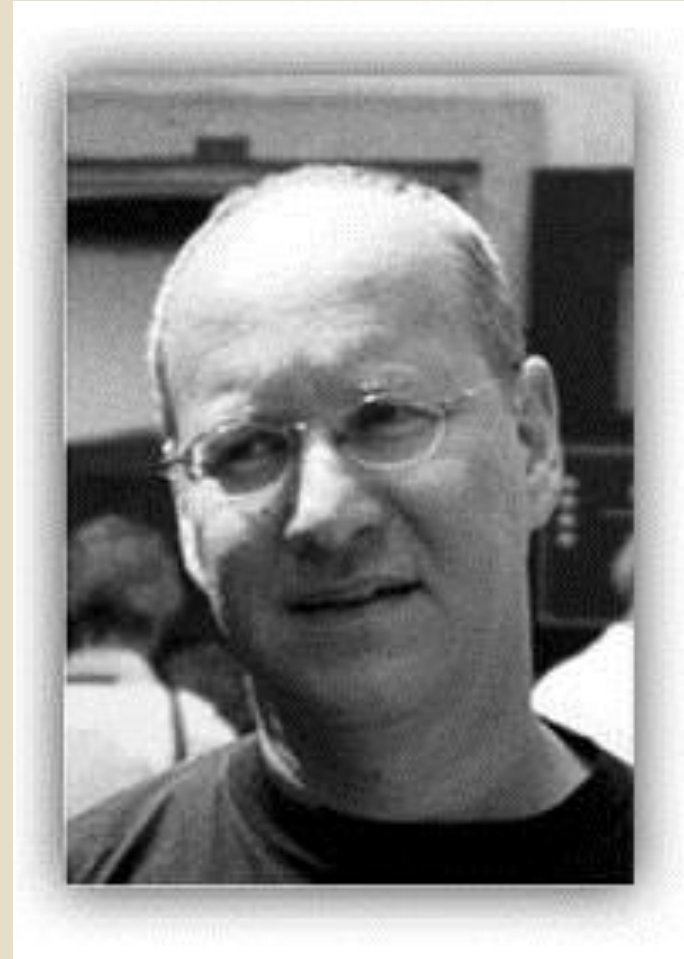
Areas of Human Brain

- Consolidation of explicit memories; both cerebral cortex and hippocampus
- Initial memory stored in cortical regions (auditory, visual...), and hippocampus
- Hippocampus helps stabilize memory in cortex; finally erased from hippocampus
- Hippocampus also responsible for weaving together; old memories with newer ones
- When our sleep suffers, our memory also suffers



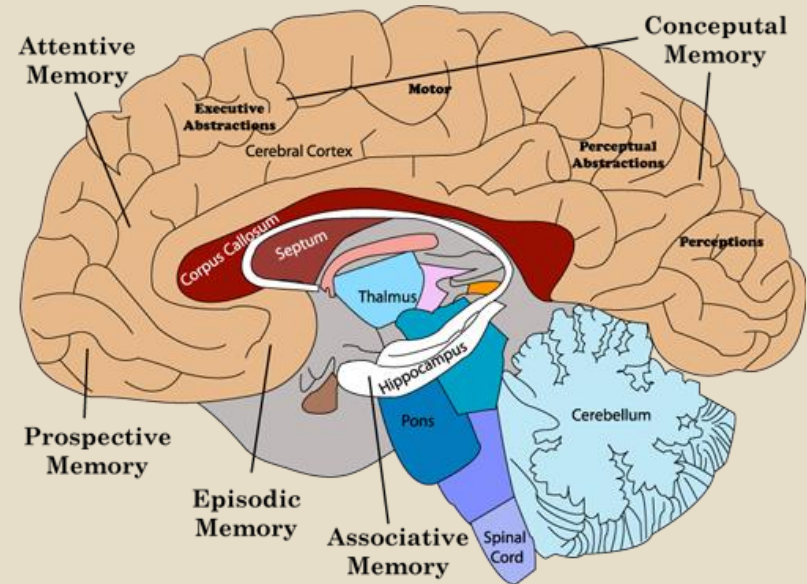
Computers and Brains

- Kobi Rosenblum; Department of Neurobiology and Ethology, University of Haifa, Israel: “The process of long-term memory creation in the human brain is one of the incredible processes which is so clearly different than ‘artificial brains’ like those in a computer.”
- Computer memory exists as simple binary bits – ones and zeros, connected together via electrons in circuits



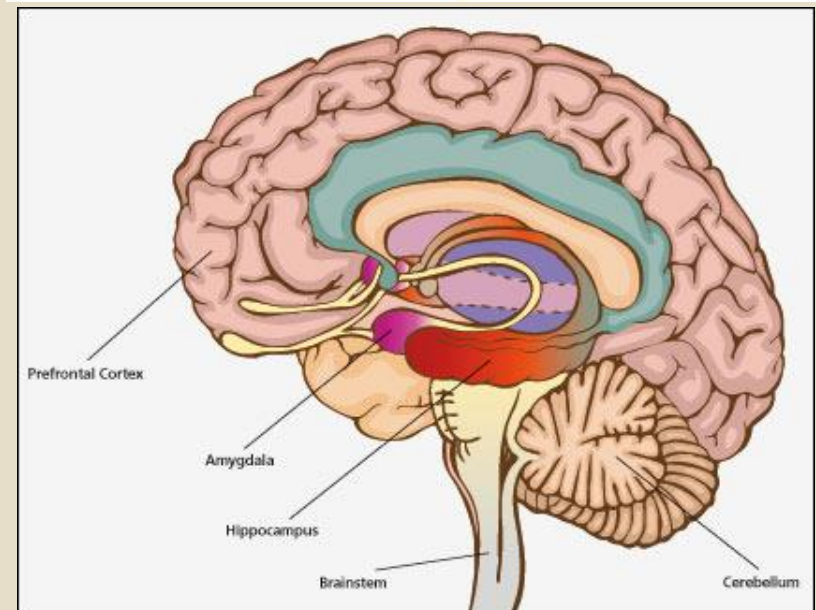
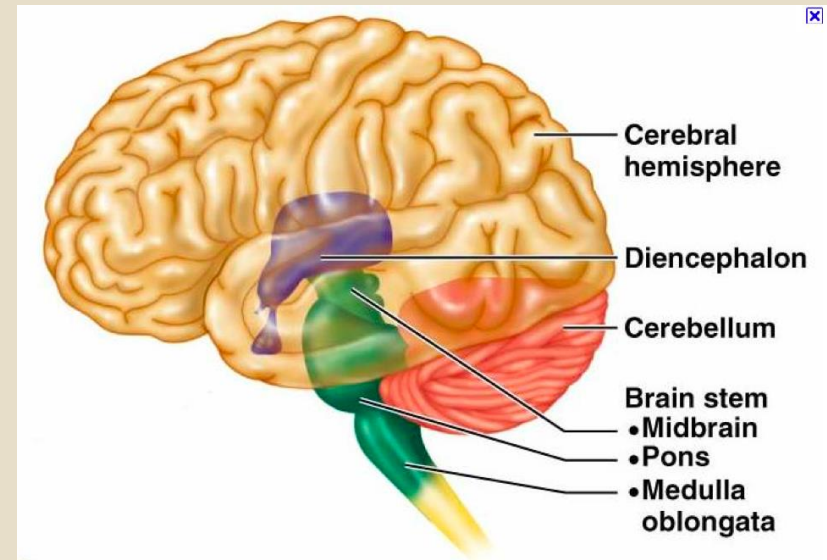
Memory

- “The proponents of the outsourcing idea also confuse working memory with long-term memory...not ‘freeing up’ space in his brain for other functions.”
- Kandel: “For a memory to persist, the incoming information must be thoroughly and deeply processed. This is accomplished by attending to the information and associating it meaningfully and systematically with knowledge already well established in memory.”



Cascade, leading to memory...

- Conscious attention begins in frontal lobes
- Establish attention; cortex sends signals to neurons in midbrain
- Midbrain produces neurotransmitter dopamine
- Neurons from midbrain reach down into hippocampus, funnel dopamine
- Explicit memories begin forming; genes start forming new proteins
- Some antibiotics stop formation of proteins; block formation of long-term memories



The Decision is Yours...

- David Foster Wallace
(2005)
- “Learning how to think’ really means learning how to exercise some control over *how* and *what* you think. It means being conscious and aware enough to choose what you pay attention to and to *choose* how you construct meaning from experience.”



Digression: Writing this Book

- Moved from Boston suburbs to mountains of Colorado
- No cell phone service, DSL connection Internet; cancelled Twitter; mothballed Facebook, blog
- Shutdown RSS reader, curtailed Skyping and instant messaging...
- Changed e-mail habits!!!
- Backsliding already...
- Blu-ray player with Wi-Fi; streaming from Pandora, NetFlix, YouTube...it's cool...



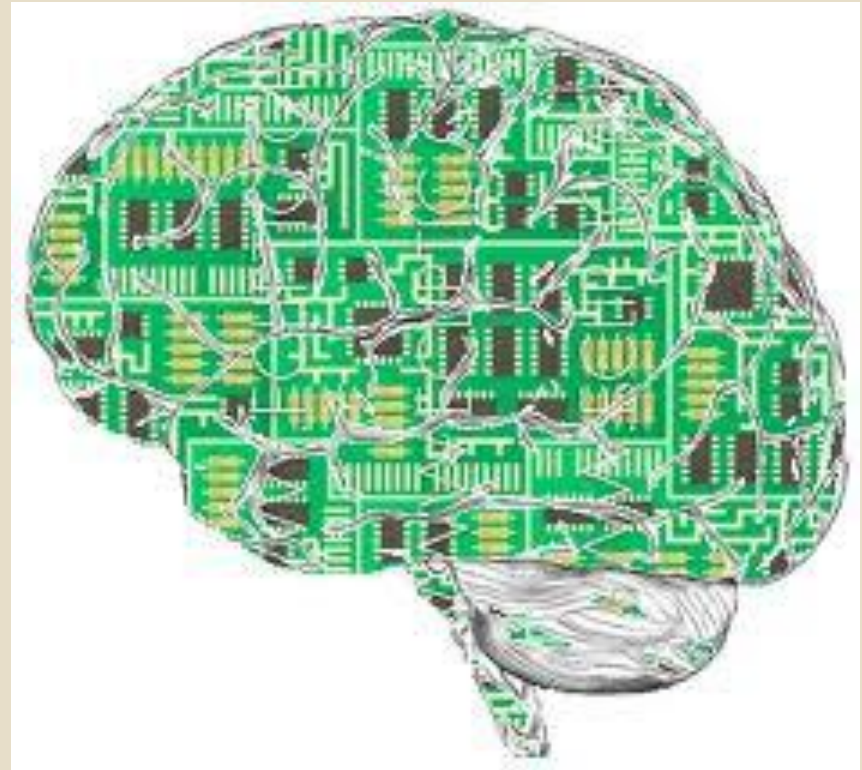
Chapter 10: A Thing Like Me

- Joseph Weizenbaum: computer scientist at MIT; ELIZA
- Simple rules English grammar
- Identify salient word, phrase
- Transform sentence into a new sentence, appeared to be response
- Rogerian psychotherapist
- MIT; national plaything; his secretary; psychiatrists and scientists jumped on board...
- Carl Sagan: “network of computer therapeutic terminals”



Can Machines Think?

- Alan Turing: *Computing Machinery and Intelligence* (1950)
- Could person distinguish the “computer” from the “live person”?
- With ELIZA, people wanted to believe machine had human qualities...could think
- Weizenbaum: *Computer Power and Human Reason* (1976)
- Self-awareness and the courage to refuse to delegate...



The Price We Pay...

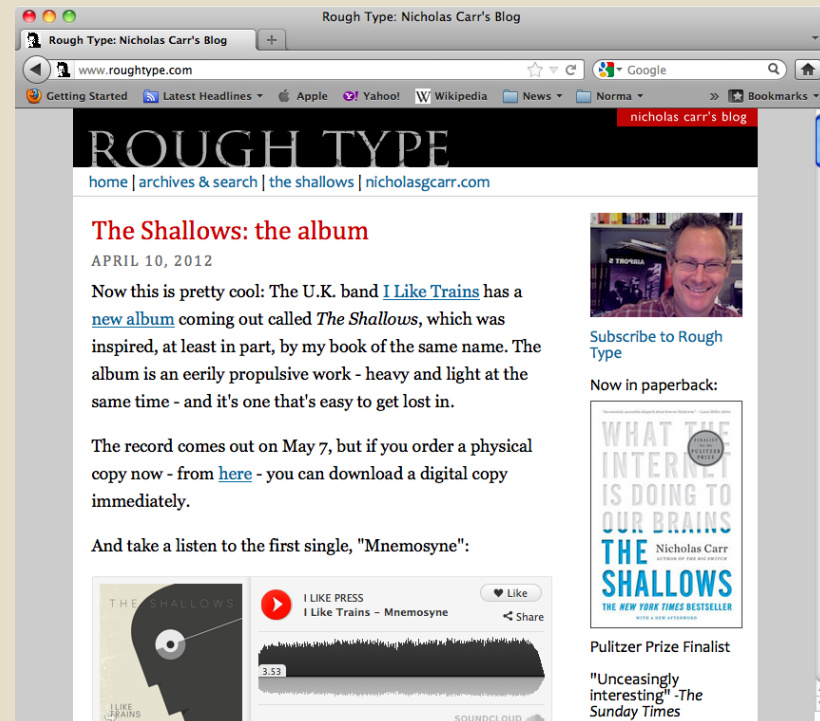
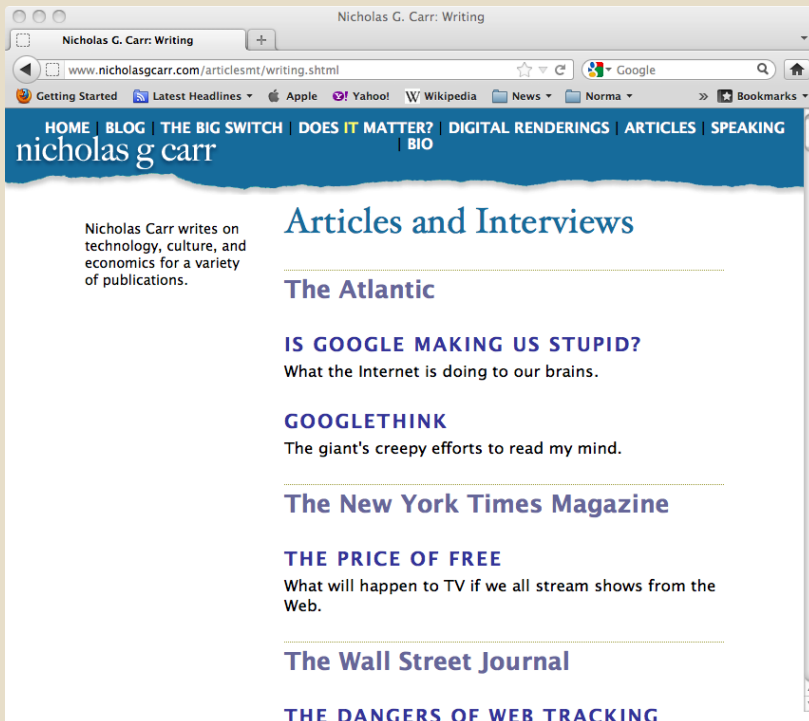
- “The tools of the mind amplify and in turn numb the most intimate, the most human, of our natural capacities – those for reason, perception, memory, emotion.”
- “Whenever we use a tool to exert greater control over the outside world, we change our relationship with that world.”



Marshall McLuhan
*Understanding Media: The
Extensions of Man* (1964)

Nicholas G. Carr Websites:

- <http://www.nicholasgcarr.com>
- <http://www.nicholasgcarr.com/articlesmt/writing.shtml>
- <http://www.roughtype.com>



The Original Article...

Is Google Making Us Stupid? - Magazine - The Atlantic

www.theatlantic.com/magazine/archive/2008/07/is-google-making-us-stupid

the Atlantic
WEDNESDAY, APRIL 11, 2012
POLITICS | BUSINESS | ENTERTAINMENT | INTERNATIONAL

JULY/AUGUST 2008 ATLANTIC MAGAZINE

Is Google Making Us Stupid?

What the Internet is doing to our brains

By NICHOLAS CARR

Illustration by Guy Billout



173 Recommend 17k

Is Google Making Us Stupid? - Wikipedia, the free encyclopedia

en.wikipedia.org/wiki/Is_Google_Making_Us_Stupid

WIKIPEDIA
The Free Encyclopedia

Is Google Making Us Stupid?

From Wikipedia, the free encyclopedia
(Redirected from *Is Google Making Us Stupid*)

"Is Google Making Us Stupid? What the Internet is doing to our brains" is a magazine article by technology writer **Nicholas G. Carr** highly critical of the Internet's effect on **cognition**. It was published in the July/August 2008 edition of *The Atlantic* magazine as a six-page cover story.^[1] Carr's main argument is that the Internet might have detrimental effects on cognition that diminish the capacity for concentration and contemplation. Despite the title, the article is not specifically targeted at **Google**, but more at the cognitive impact of the **Internet** and **World Wide Web**.^{[2][3]} Carr expanded his argument in *The Shallows: What the Internet Is Doing to*



Cover page in *The Atlantic* issue "Is Google Making Us Stupid?"

Writer **Nicholas G. Carr**


Categories **Advocacy journalism**

First issue Published in *The Atlantic*, July/August 2008.

Website **Cover story**

The Other Viewpoint:

BOOKS & ARTS COMMENT



The mind's ability to adapt suggests that it can cope with our wired world — for better or worse.

NEUROSCIENCE

Browsing and the brain

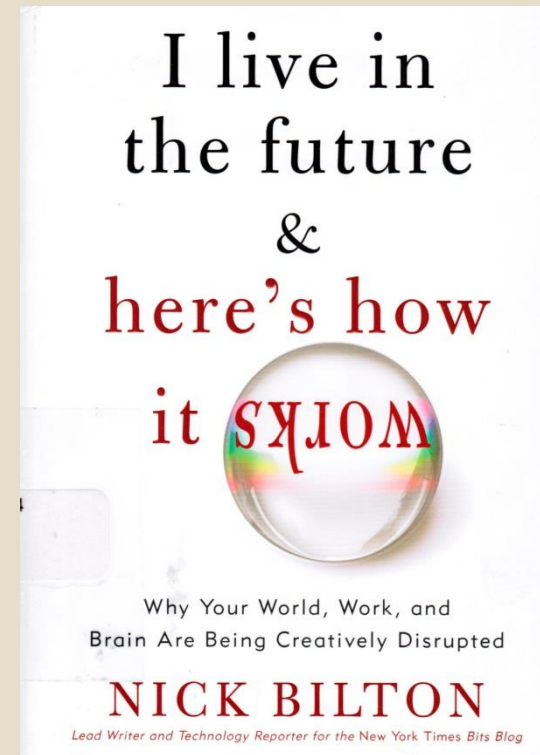
Two books reach opposite verdicts on how the Internet affects us, find Daphne Bavelier and C. Shawn Green.

Whenever a new technology reaches a tipping point of popularity, questions soon follow about its effects on society. The rise of the Internet has provoked two books probing its impact on the human brain. The fact that the authors reach opposite conclusions, despite relying on the same scientific evidence, underscores how little research has been done on this topic.

Nicholas Carr's *The Shallows* laments the possibility that long-term Internet exposure

The Shallows: What the Internet is Doing to Our Brains/How the Internet is Changing the Way We Think, Read and Remember
NICHOLAS CARR
W. W. Norton/Atlantic Books: 201 0.276 pp./384 pp.
\$26.95/£17.99

I Live in the Future & Here's How it Works: Why Your World, Work, and Brain are Being Creatively Disrupted
NICK BILTON
Crown: 201 0.304 pp. \$25, £16.99



Bavelier, D., & Green, C. S.
Neuroscience: *Browsing
and the brain*.
Nature, 470(7332), 37-38.

Bilton, N. (2010).
*I live in the future & here's
how it works: Why your
world, work, and brain are
being creatively disrupted*.

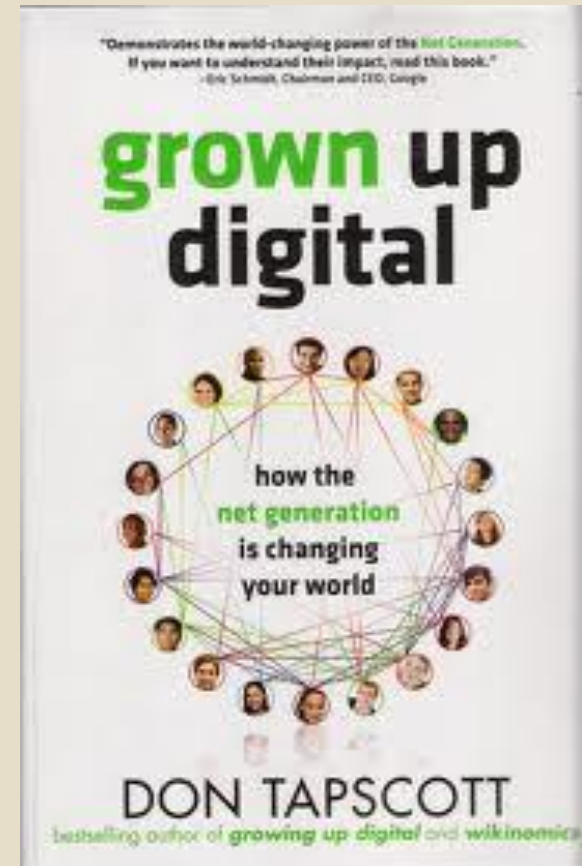
Scientific American MIND

- *Supertaskers and the Multitasking Brain*; David Strayer, Jason Watson
- March/April issue, 2012; page 22
- Cell phone on attention to driving; most people are drastically reduced, may even be worse than legal “impaired limit” for alcohol
- Most multitaskers actually worse...
- Identified a very few abnormalities, who can multitask with ease
- Searching for genetic and physiological support for differences



Another Possibility...

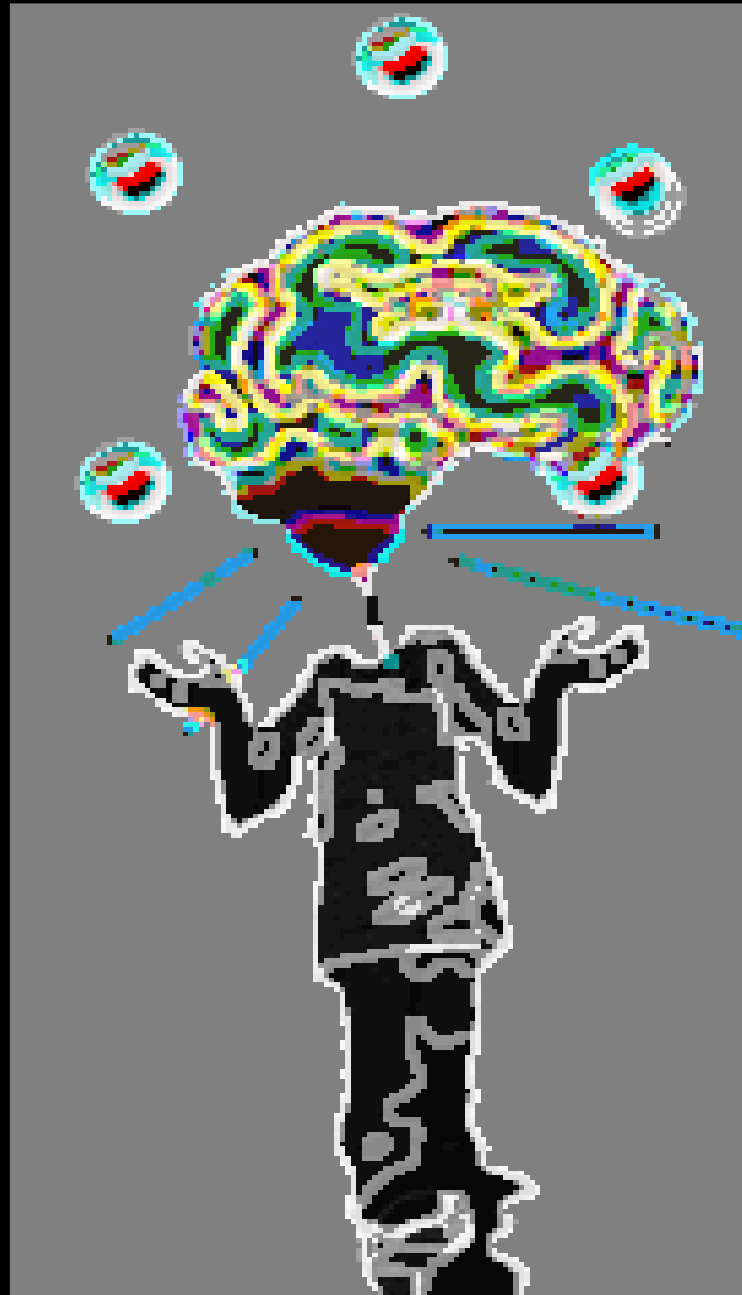
- Don Tapscott (2009)
- Media, Technology, Innovation
- Adjunct Professor of Management;
B.Sc. In Psychology and Statistics;
M.Ed. in Research Methodology
- nGenera founder (1993)
- 4.5 million dollar research study of
over 11,000 young people and
examines how the net generation is
changing the world and all of its
institutions
- <http://www.dontapscott.com/books/grown-up-digital/>



Closing Thoughts

Technology Rapidly Changing





Our Internet Brain ?

Nicholas Carr and Jimmy Wales

- 5-minute snippet of debate between author of this book, Nicholas Carr, and founder of Wikipedia, Jimmy Wales
- Debate occurred at DePauw University; March 30, 2011



[Hyperlink to Ubben Debate:
Kresge Auditorium, DePauw
University](#)