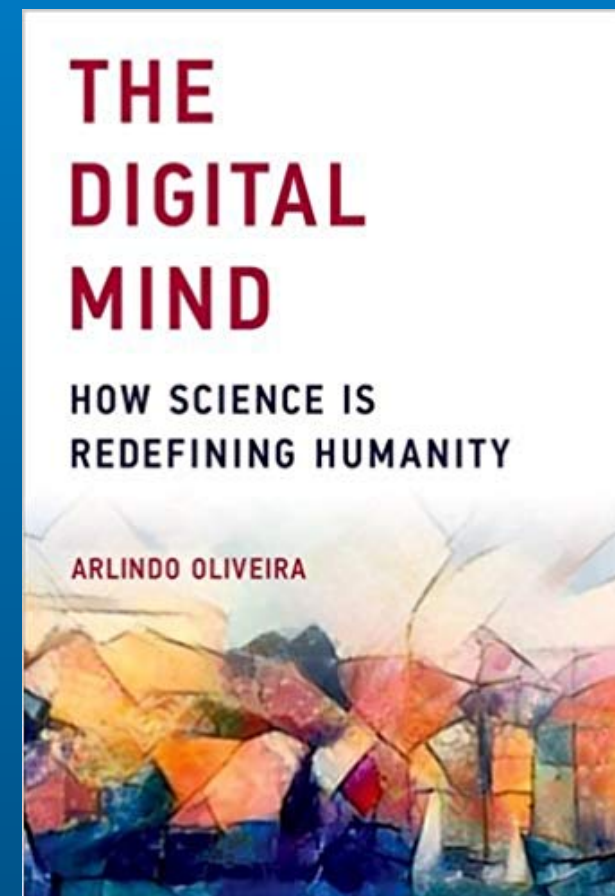
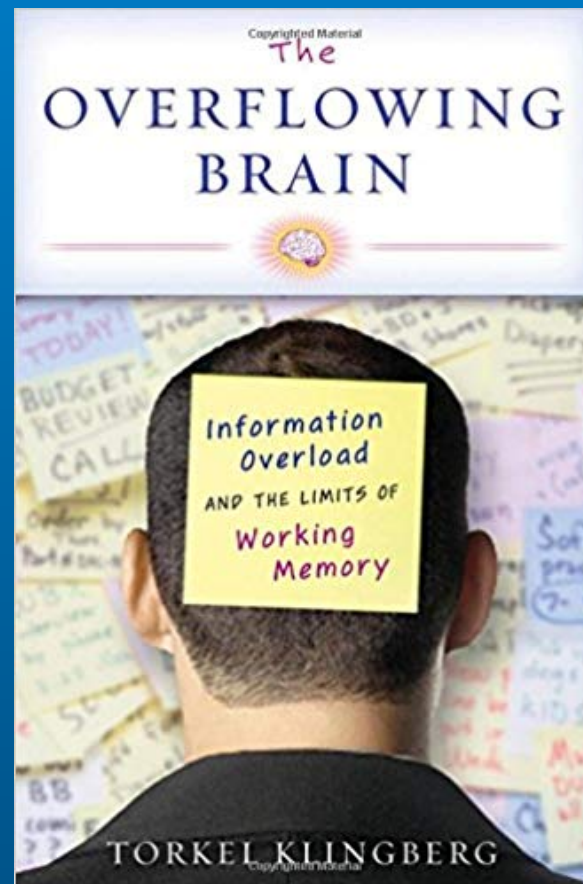
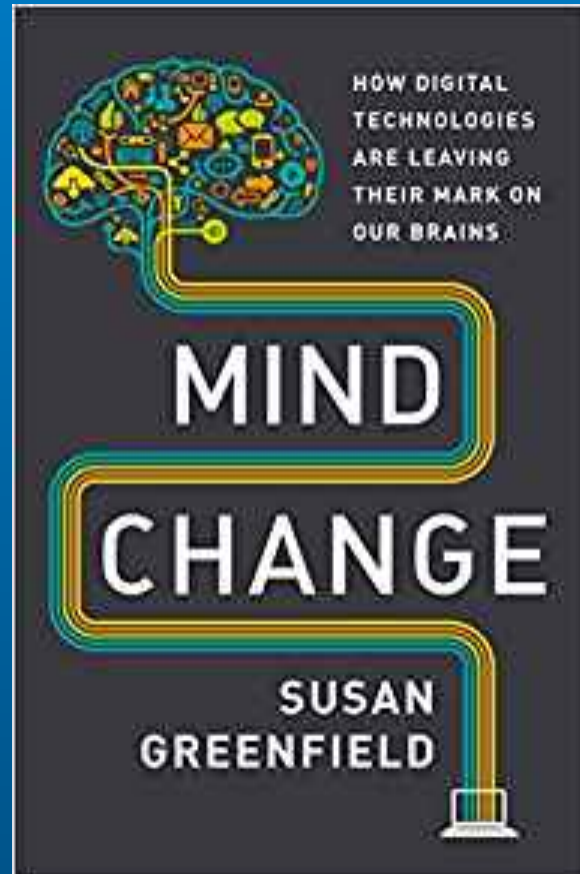
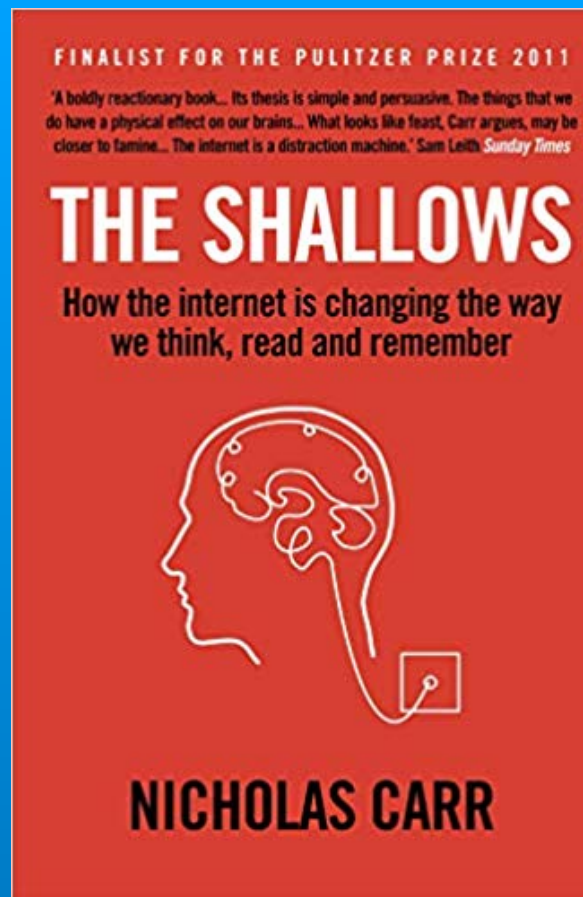


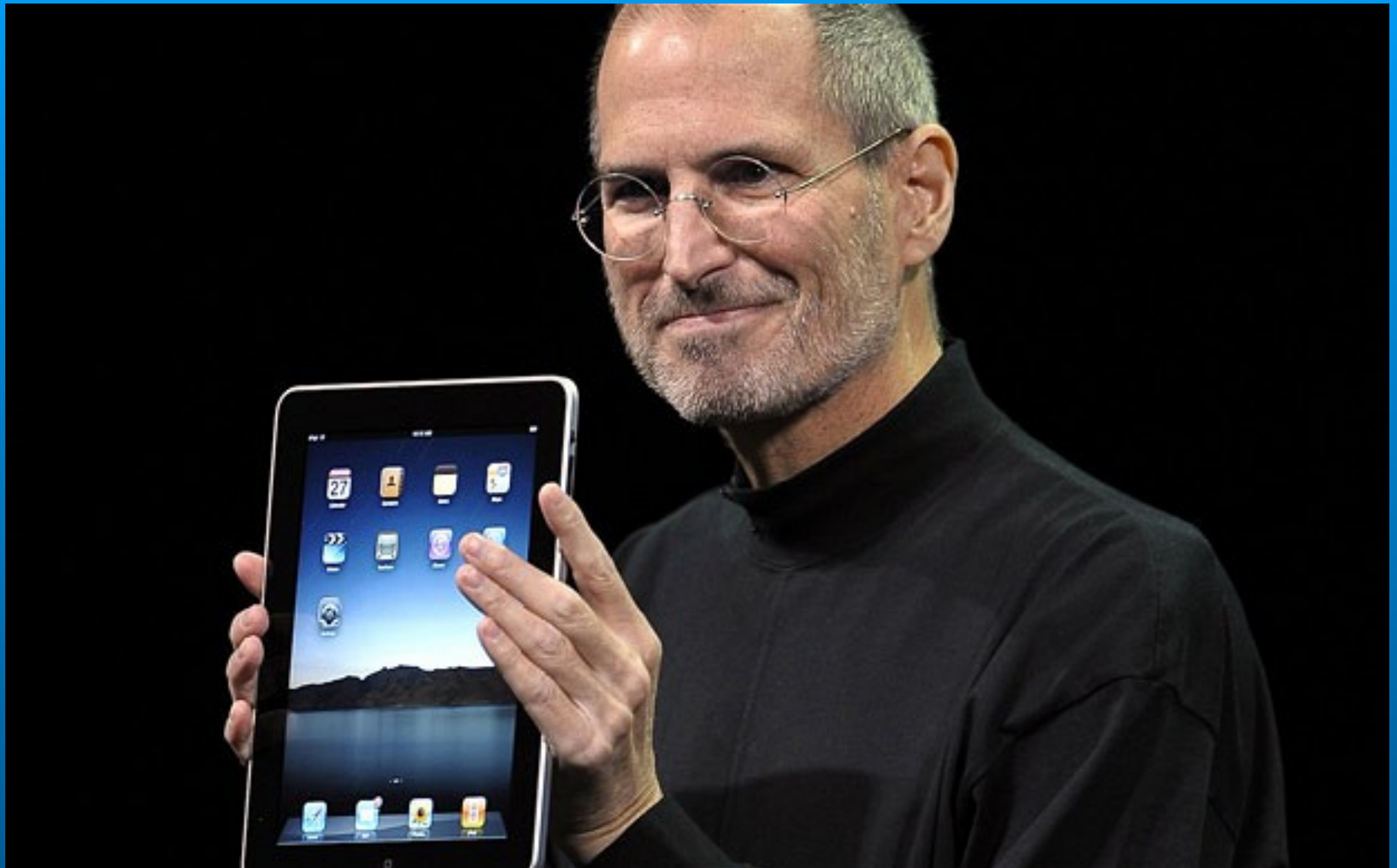
Technology and the Brain

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January 27, 2010, Steve Jobs unveiling the iPad for the first time

What Do Tech Experts Say About Their Products?

- Steve Jobs... believed everyone should own an iPad. But he refused to let his children use the device. “We limit how much technology our kids use in the home.”¹
- Chris Anderson, the former editor of Wired, enforced strict time limits on every device in his home, “because we have seen the dangers of technology firsthand”¹
- Evan Williams, a founder of Blogger, Twitter, and Medium, reportedly bought hundreds of books for his two young sons, but refused to give them an iPad¹
- Tristan Harris, a “design ethicist,” states that the problem is not that people lack willpower; it is that “there are a thousand people on the other side of the screen whose job it is to break down the self-regulation you have.”¹

Just Media Hype?

- Experts - and some less expert - have used expressions such as:
- “Digital Drugs”
- “Electronic Cocaine”
- “Social media more addictive than crack cocaine”
- “Smartphones give you dopamine highs”

Form and Content

● The Form:

- ★ The technology itself
- ★ Screen type and time
- ★ Interactive vs passive screen time
- ★ Gaming platforms

● The Content:

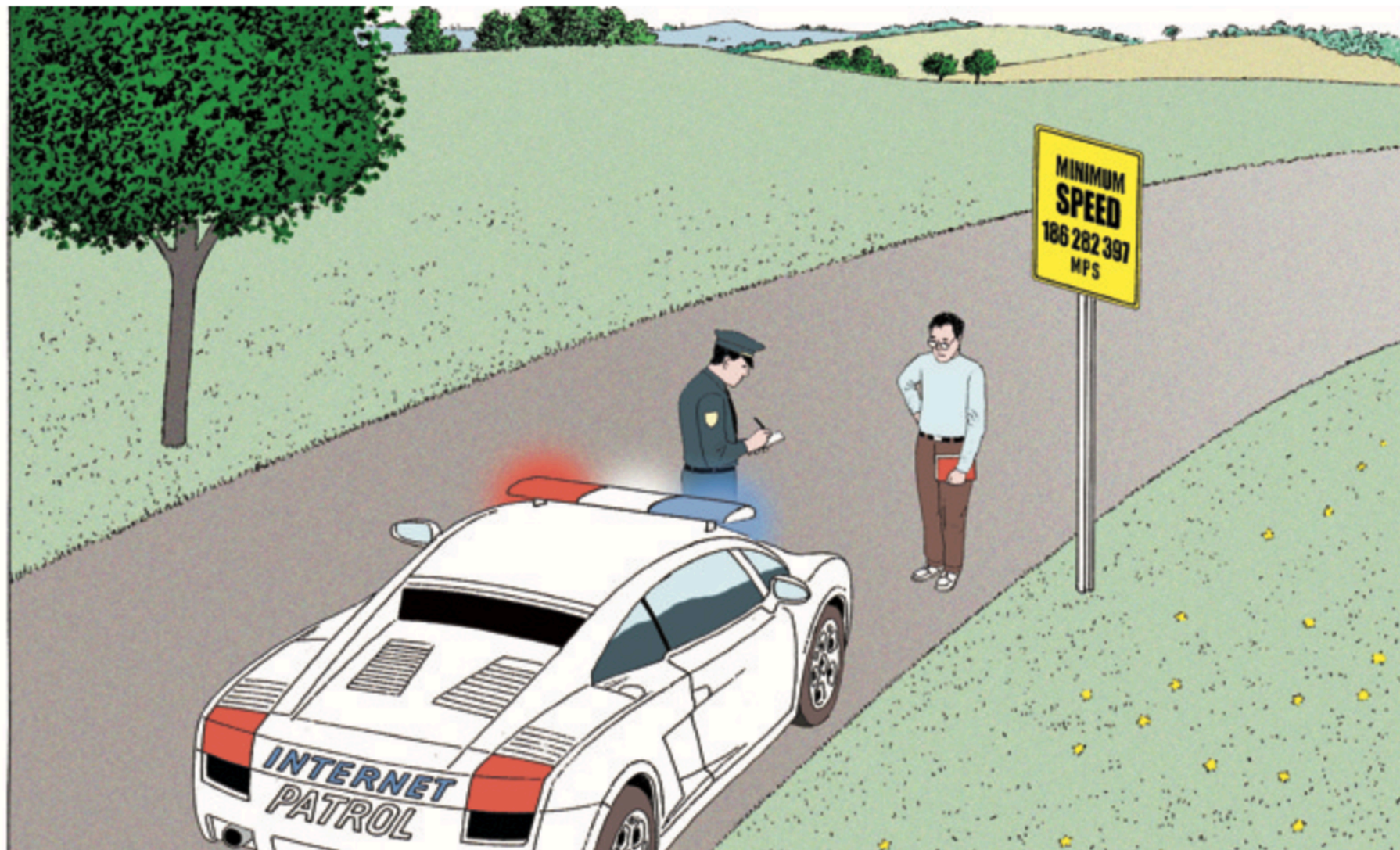
- ★ The Google problem
- ★ Fear of Missing Out
- ★ Bullying
- ★ “Sexting”
- ★ Being influenced/manipulated
- ★ Emotional contagion
- ★ Information addiction and faux knowledge
- ★ Inappropriate self-disclosure

TECHNOLOGY

Is Google Making Us Stupid?

What the Internet is doing to our brains

NICHOLAS CARR JULY/AUGUST 2008 ISSUE



Drinking from the Firehose of Technology 1

- “Digital Dementia”
- Reading linear narrative and expository text on a screen leads to poorer reading comprehension than reading the same texts on paper
- Retention of information falling because it is “always available”
- Diminished interest in learning background knowledge or principles, since facts are, again, “always available”
- Diminishing our attention spans, undermining our appreciation of narrative and therefore standardizing thought
- Undermining depth and reflection: thinking that is increasingly “shallow, narrow, cursory, hurried, fractured and thin,” while problem solving and creativity requires thinking that is calm, concentrated, focused, attentive and reflective

Drinking from the Firehose of Technology 2

- “Absent presence”
- Poor eye contact
- Having to teach children how to identify and read the human face
- Constantly distracted and over-stimulated
- Facts have become equated with knowledge
- Social media = self-centered media which fosters narcissism
- Risk averse
- Improving graphic but falling written skills
- The risk of experiencing events not as participants, but as recording devices
- Experience without quality
- “Nomophobia” (Fear of losing technology, e.g. loss of cell phone)

Drinking from the Firehose of Technology 3

- A recent study conducted in Boston examined young people ages 7-18 and compared them with a similar cohort twenty years ago
- The current group:
 - ★ Had never been lost
 - ✦ Though clearly highly desirable, they also could not work out how to cope with such a situation
 - ★ Had poor resilience
 - ✦ Difficulties in addressing and modulating pain, either physical or emotional, which may explain behaviors such as consuming acetaminophen to reduce social pain
 - ★ Better creative graphic skills, but poorer reading and creative writing
- No question that technology induces cognitive effects, but are they a disability, or might new media actually enhance attention, memory, and effect as our brains continue to adapt to new technologies?

Drinking from the Firehose of Technology 4

- Jean Twenge has been engaged in multiple longitudinal studies:
- She reports that in adolescents:
 - ★ Around 2012 there were several sudden changes:
 - ✦ Going out with friends less often
 - ✦ A dramatic increase in young people reporting that they felt sad lonely or left out
 - ★ A 50% rise in diagnosed major depressive disorder in adolescents in 2011-2015
 - ★ The suicide rate for 12-14 year olds has doubled since 2007
- More than 50% of people had smart phones in 2012 for the first time
- Teen depression rising despite unemployment falling

The Challenge of Technology

- Although there are undoubtedly multiple associations with technology, we clearly need to avoid obfuscating association and causation
- We also recognize the need to avoid the monocausal fallacy
- It is highly likely that potentially deleterious effects of technology are a “component cause”
- And if technology is indeed causing problems, we need to try and establish what factors are doing what
- For example, why are so many young people getting into trouble with technology?
 - ★ What is it about the technology?
 - ★ What is it about them?
 - ★ What is it about us?

Technology and Learning

- If you “Google” something, you will not learn it
- Reading a paper textbook dramatically improves retention compared with reading a .pdf or on screen
- Reading is good for your education, clicking is not
- Greater physical and mental demands of reading on a screen; the action of scrolling, and in some cases, glare and flicker
- Fatigue and energy depletion appear to be worse when reading on tablets or computers

Social Media Stressors

- The “Highlight Reel” is the comparison driver
- Social Currency:
 - ★ Likes, comments and shares
 - ★ Economy of attention.
- In our social media WE are the product, and it is changing our identity
- Obsessed with perfection, and there is a physiological response if we fail to achieve it

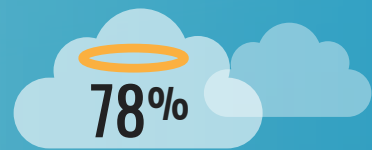
PLUGGED-IN PARENTS: ATTITUDES, BEHAVIORS, AND ROLE MODELS

Time Spent



Nine hours and 22 minutes is the average time parents spend with screen media daily, including for personal and work use. 7:43 of that time is devoted to personal screen media.

Role Models

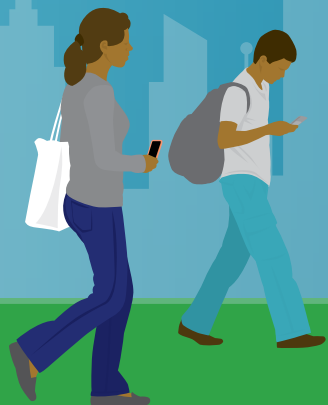


78% of all parents believe they are good media and technology role models for their children.

Technology and Education



94% of parents think technology positively supports their children with schoolwork and education.

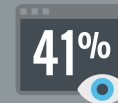


Monitoring



85% of parents say that monitoring their children's media use is important for their children's safety.

Personal Privacy



41% of parents check the content of their children's devices and social media accounts "always" or "most of the time."

Bedtime

63% say mobile devices are not allowed during bedtime.

34% think that using technology disrupts their children's sleep.



Top Parental Concerns

56%
TECHNOLOGY
ADDICTION



43%
TOO MUCH
TIME ONLINE



38%
OVERSHARING
PERSONAL INFO



36%
ACCESS TO
PORNOGRAPHY



Social Media Perceptions



50% believe that social media hurts physical activity.



34% believe that social media hurts face-to-face communication.



44% believe that social media helps their children's relationships with friends.



Family Rules

78% do not allow mobile devices during family meals.

34% do not allow mobile devices when guests are visiting.

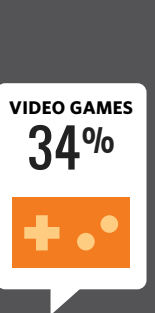
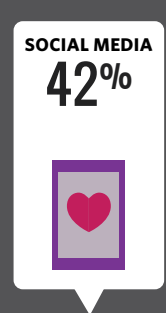
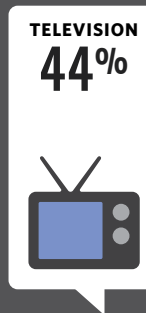
9% do not allow car passengers to use mobile devices.



This report provides a comprehensive picture of parents' media use, attitudes toward their tweens' and teens' media use, and a look into the ways that parents mediate, monitor, and manage media. The report is based on a nationally representative survey of 1,786 parents of children age 8 to 18 living in the United States that was conducted from July 8, 2016, to July 25, 2016.

Talking About Media

Percent of parents who discuss content with their children "always" or "most of the time," by media type.



Parents of tweens are more likely than parents of teens to discuss the media their children use.

commonsense.org/research

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Are We Facing a New Addiction?

- *Probably* yes, but we clearly need more data, and it is a “behavioral addiction”
- Several distinct components of behavioral addiction are commonly identified as:
 - ★ **Salience** – the activity becomes more important than anything else and dominates thinking,
 - ★ **Mood modification** – experiencing the activity leads to an arousing “buzz” or a “high,”
 - ★ **Tolerance** – ability to do increasing amounts of the particular activity,
 - ★ **Withdrawal** – unpleasant states when activity is discontinued or suddenly reduced
 - ★ **Conflict** (inter- or intra-personal)
 - ★ **Relapse** – addictive patterns are easily and quickly restored even after a long time of abstinence or control

Are We Facing a New Addiction?

- If, as seems likely, we are indeed dealing with a behavioral addiction, we know from an enormous body of research in other addictions, that the causes are likely multifactorial:
 - ★ Genetic predisposition, not only to addiction itself, but also abnormal reward sensitivity, learning, impulsivity and memory
 - ★ “Self-medication” of pre-existing anxiety, social rejection etc
 - ★ “Internet addiction” may also be a *symptom* of, for example ADHD, ASD, narcissism or salience disruption, or poor emotion differentiation
 - ★ Poor role models
 - ★ Poor reciprocity in social supports
 - ★ Loss of moral compass
 - ★ Poor sense of meaning or purpose
- It is essential to avoid being wedded to any one “model”

What About Scientific Criteria?

- Although the DSM-5 only describes symptoms of gambling disorder, the Appendix lists additional forms of behavioral addiction that should be explored (e.g., excessive use of social media or watching pornography), and proposes criteria for Internet gaming disorders
- Several experts believe that this form of entertainment can lead to preoccupation (obsessive thinking about online games), overuse, neglecting areas of everyday life, social isolation, inter- and intra-personal conflicts, and escape from painful reality
- Such people risk substituting real life with virtual reality

Some Likely Contributory Factors

- Multitasking
- Self-absorption
- Inappropriate endorsement
- Comparison
- Rumination
- Entanglement
- Mechanomorphic thinking

The Consequences

- Distraction
- Dissociation
- Accidents
- “iPhone Neck”
- “Zombie eating”
- Depression, rumination and social anxiety in relation to problematic smartphone use
- Digital addiction increases loneliness, anxiety and depression
- “Trapped in a daydream: daily elevations in maladaptive daydreaming”
- Reinforcers: excess screen time associated with multiple high risk behaviors
- Internet gaming linked to introversion, craving and loss of control

The Consequences

- Are young people able to care for themselves?
- Not only finding their way home, but solving any simple problems?
- What happens to them if the machine stops?
- Are they able to cope?
- Are they able to plan and make decisions?
- Are they able to interact?
- Are they able to make mistakes?
- Resilience
- Able to self-regulate: there are few consequences of saying foul things online. Some people are then unable to behave normally in the real world

The Consequences

- In therapy we now constantly see people incapable of making decisions or taking action
- They report constantly that:
 - ★ They have too many choices
 - ★ That they are terrified of making a bad decision
- The internet has created a fiction that the answers to any problem are available immediately
- Many therefore do not realize that sometimes we have to act on insufficient data, we use knowledge, experience, gut feelings
- It is now commonplace to find that people will not try to solve, e.g. chess problems or clinical dilemmas, instead “looking up the answer”
- Others report spending the first 5-10 minutes of a movie looking up a synopsis of the plot, rather than waiting for it to unfold

Rating Scales

- 1. Internet-Related Problem Scale (IRPS)
- 2. Internet Addiction Disorder (IAD)
- 3. Smartphone Compulsion Test
- 4. Bergen Facebook Addiction Scale
- 5. Young's Internet Addiction Test
- 6. Problematic Internet Use Questionnaire (PIUQ)
- 7. Compulsive Internet Use Scale (CIUS)

Warning Signs

- Is your child staying up later and later to stay on the computer?
- Does your child get fidgety, anxious and/ or angry if they don't have their device?
- Is their tech usage negatively impacting their schoolwork, family life or other activities or interests?
- Is your child indicating that he or she has a difficult time getting virtual imagery out of their heads?
- Is your child dreaming of virtual imagery?
- Is your child hiding their screen usage or hiding their devices from you?
- Does your child seem to be having a more difficult time regulating their emotions (also known as emotional dysregulation)?
- Does your child seem more apathetic and bored more easily?
- Does your child seem perpetually tired yet also wired (“wired and tired”)?
- Are teachers complaining that your child is falling asleep in school?

Internet Addiction Disorder

- Do you feel preoccupied with the internet (that is, think about previous online activity or anticipate your next online session)?
- Do you feel the need to use the internet for increasing amounts of time in order to achieve satisfaction?
- Have you repeatedly made unsuccessful efforts to control, cut back or stop internet use?
- Do you feel restless, moody, depressed or irritable when attempting to cut down or stop internet use?
- Do you stay online longer than originally intended?
- Have you jeopardized or risked the loss of a significant relationship, job, educational or career opportunity because of the internet?
- Have you lied to family members, a therapist or others to conceal the extent of involvement with the internet?
- Do you use the internet as a way of escaping from problems or of relieving a distressed mood (for example, feelings of helplessness, guilt, anxiety and depression)?

Posture, Mood and Cognition

- A perfect storm:
 - ★ Sitting is associated with anxiety
 - ✦ Standing mutes taste buds and improves attention
 - ★ Junk food
 - ★ Junk information
 - ★ Devices designed to cause sudden explosive release of dopamine
- Close link between cerebellar and vestibular and hippocampal function

Smartphone Addiction Scale

- 1 Missing planned work due to smartphone use
- 2 Having a hard time concentrating in class, while doing assignments, or while working due to smartphone use
- 3 Feeling pain in the wrists or at the back of the neck while using a smartphone
- 4 Won't be able to stand not having a smartphone
- 5 Feeling impatient and fretful when I am not holding my smartphone
- 6 Having my smartphone in my mind even when I am not using it
- 7 I will never give up using my smartphone even when my daily life is already greatly affected by it
- 8 Constantly checking my smartphone so as not to miss conversations between other people on Twitter or Facebook
- 9 Using my smartphone longer than I had intended
- 10 The people around me tell me that I use my smartphone too much

Fear of Missing Out Scale: FoMOs

1. I fear others have more rewarding experiences than me
2. I fear my friends have more rewarding experiences than me
3. I get worried when I find out my friends are having fun without me
4. I get anxious when I don't know what my friends are up to
5. It is important that I understand my friends "in jokes."
6. Sometimes, I wonder if I spend too much time keeping up with what is going on
7. It bothers me when I miss an opportunity to meet up with friends
8. When I have a good time it is important for me to share the details online (e.g. updating status)
9. When I miss out on a planned get-together it bothers me
10. When I go on vacation, I continue to keep tabs on what my friends are doing

Response Anchors:

Not at all true of me (1) to Extremely true of me (5)

A Simple Model to Help Us Plan

- It is clearly limited simply to blame technology and to arrange arbitrary limitations on technology use or the “Digital detox”
- We have made extensive use of “Petty’s Four Ps:”
 - ★ Precipitating
 - ★ Predisposing
 - ★ Perpetuating
 - ★ Protecting

What Could We Be Doing?

- Do not feel guilty about things that we did - or did not do - in the past
- Social media is simply a new environment
 - ★ But users may not be as expert as they think they are
- Parenting has not changed
- Modeling good behavior is crucial
- We learn from each other
- Content is key, but context is king
- Co-engagement counts
- Playtime unplugged
- Set limits
- Create tech-free zones

No App Can Replace a Lap

- Building resilience is more than simply avoiding technology
- Young people often feel disempowered, in part because of the rise of unearned rewards, thus social media and some mastery of technology provides a sense of mastery
- We all need to have control of our surroundings and that is particularly potent in children
- Silence and imagination are amongst the keys to a healthy life: both of those are being undermined by social media
- “Zoning out” can be a relief from the pressure of paying attention, since people do not have the energy to pay attention
 - ★ Replacement strategies, e.g. Nature
 - ★ Energy building strategies
- Dealing with the reality that young people and adults are “hardwired” for social conformity

A Comprehensive Strategy

- It is essential to realize that the challenge of technology is unique in evolutionary history and constitutes an uncontrolled and potentially dangerous experiment on the population
- Approaches need to be both individual and global, policy-based
- The individual must be tailored not only to the technology, but also to the social milieu and building of resilience
- There is clearly limited political will to help, as evidenced by the “stately” response to tobacco and poor nutrition, and
- The acquiescence in marijuana legalization, despite the well-documented *causal* associations with schizophrenia, bipolar disorder, anxiety disorders and fetal maldevelopment