



Attention and Distraction: Digital Technologies and Us

“Those who are governed by reason desire nothing for themselves
which they do not also desire for the rest of humankind”

Baruch Spinoza



CLIMATE CHANGE



What qualities should an ideal high school graduate espouse to solve some of the most pressing problems of today's world including those on the previous slide?

Mission of the **Wallkill Central School District** is to

- nurture individuals **who value themselves and others**
- to develop learners who **appreciate diversity** as a resource
- to foster the **ability to think <critically> and communicate**
- to encourage **creativity, flexibility**, and the **continuous** application of
learning

What this talk is not about?

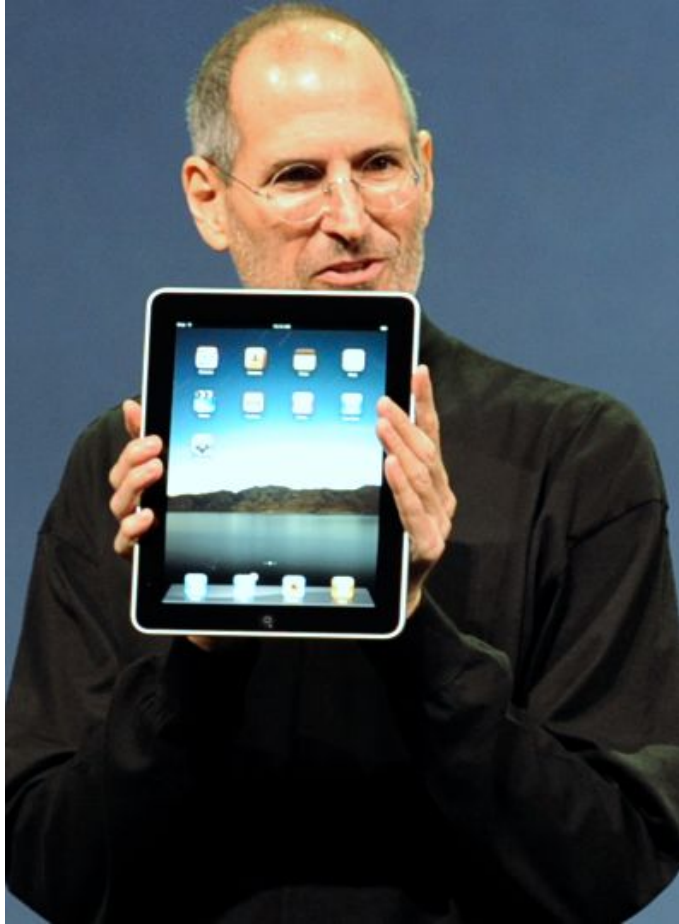
So just one plea even before I present my argument:

Let us send the term “Luddite” for garbage collection.



I wonder what Steve Jobs would have said if he were alive?





Nick Bilton (NY Times Journalist) in 2010:

“So, your kids must love the iPad?”

Steve Jobs:

“They haven’t used it. We limit how much technology our kids use at home.”

Bill Gates: Principal Founder of Microsoft Corporation



“We don’t have cellphones at the table when we are having a meal...”

“...we didn’t give our kids cellphones until they were 14”

“...they complained other kids got them earlier.”

The New York Times Bestseller Updated with a New Chapter

Go

Now available in
paperback with
a new chapter.

How Google Works

Eric Schmidt & Jonathan Rosenberg

with Alan Eagle, foreword by Larry Page

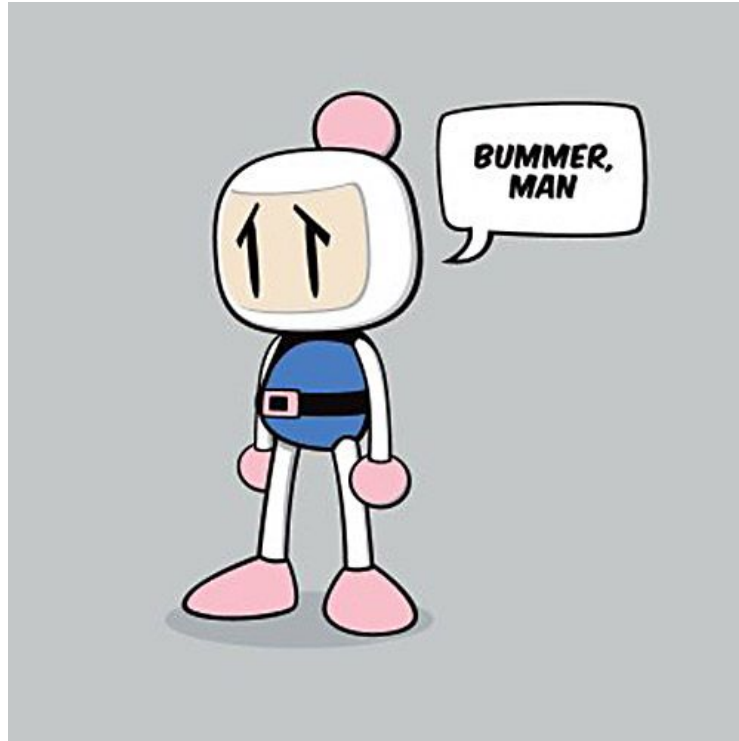
Alan Eagle, Director, Communications
- Google, Inc

“I fundamentally reject the notion you need technology aids in grammar school. The idea that an app on an iPad can better teach my kids to read or do arithmetic, that’s ridiculous.”



CEOs, CTOs, other executives, and engineers of Silicon Valley giants like Google, Apple, Yahoo and Hewlett-Packard send their children to **no-tech** schools.

There is no grand conspiracy

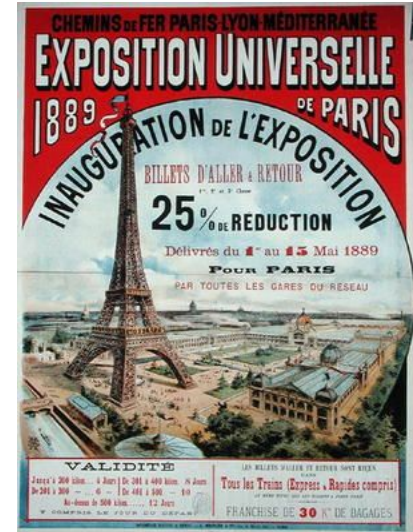


Attention Economy

(nothing novel about it)

Foundational Axiom: Attention is a finite resource.

- Parisian Posters in mid 19th century
- War Propaganda - 1st World War
- Radio
- TV



Internet/Smartphone Apps

(the latest and arguably the best attention grabbing tools)

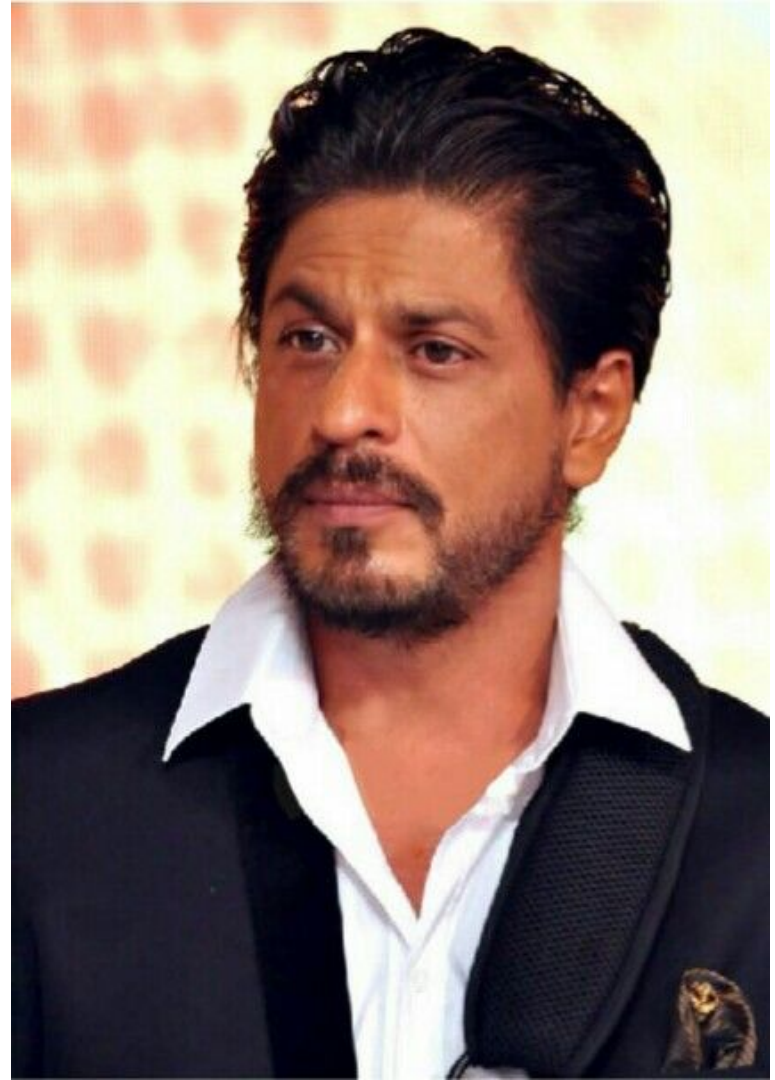
“...in an information-rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients.”

The Mantra of the Attention Economy

“When an online service is free, you're not the customer.
You're the product.”

Tim Cook, CEO of Apple

TRIVIA TIME



So how do our digital tools manage to keep our attention and why is it not the same old, same old?

Stanford Persuasive Tech Lab

“The Stanford Persuasive Technology Lab creates insight into how computing products — from websites to mobile phone software — can be designed to change what people believe and what they do.”

CAPTOLOGY

- Captology is the study of computers as persuasive technologies.
- BJ Fogg derived the term captology in 1996 from an acronym: Computers As Persuasive Technologies = CAPT.

CAPTOLOGY

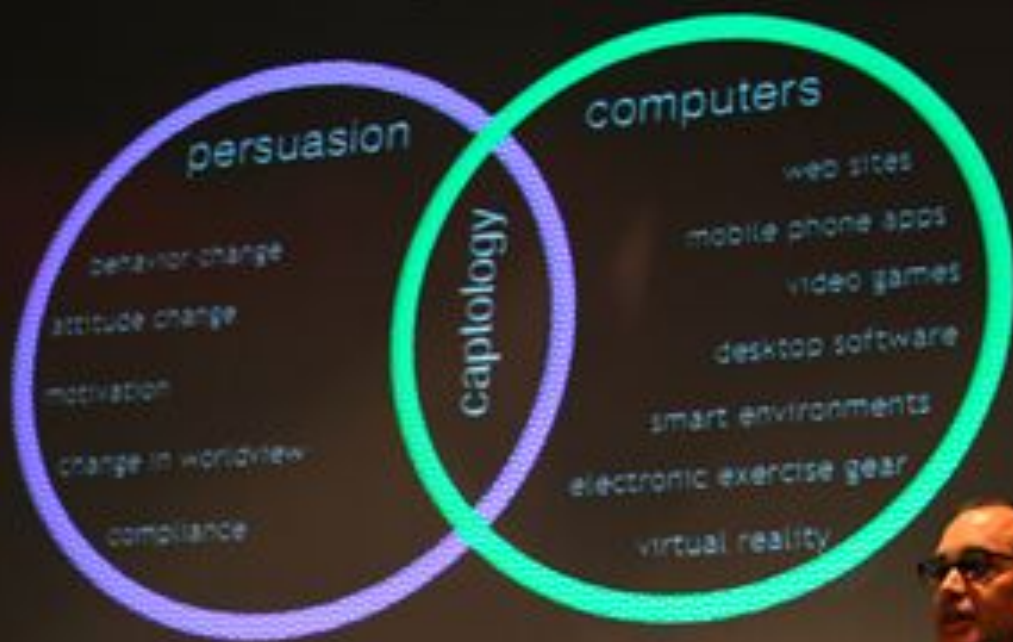
PERSUASION

Behavior change
Attitude change
Motivation
Change in worldview
Compliance

COMPUTERS

Websites
Mobile phone apps
Video games
Desktop software
Virtual Reality

captology



The M.I.T. Technology Review - “The Prophet of Habit-Forming Technology.”



NIR EYAL

Wall Street Journal Bestselling Author

Behavior Can Be Designed

Whether you are designing the behavior change of your consumers or your own habits, you'll benefit from understanding research I share from behavioral economics, neuroscience, and consumer psychology.

Bestseller - Hooked: How to Build Habit-Forming Products

Eyal (former student at the Stanford Persuasive Tech lab) says:

- subtle psychological tricks can be used to make people develop habits
- varying the rewards people receive can create “a craving”
- negative emotions that can act as “triggers” can be exploited



Revenue and virality depend
on engagement and retention.

Becoming a user's habit is necessary for an app's survival.

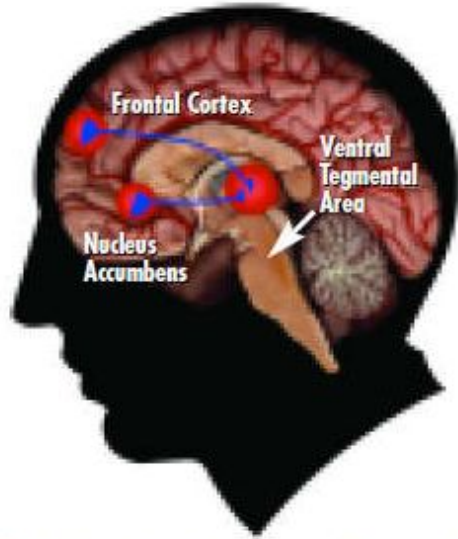
Fortunately, habits are programmable:
we do what we're reinforced for. What Delights us.

Getting reinforcement right isn't luck, it's science.
Neuroscience, specifically.

Looking into the Neuroscience of it!

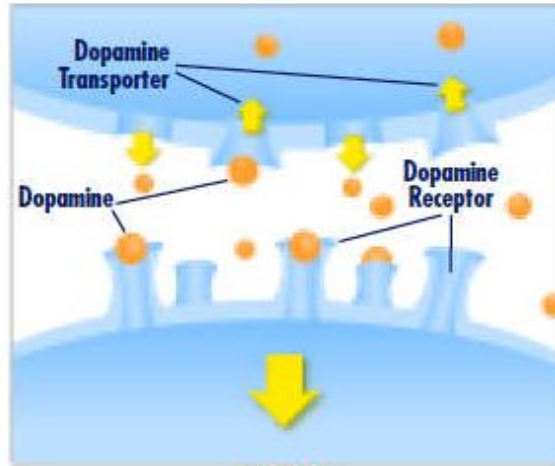
DRUGS OF ABUSE TARGET THE BRAIN'S PLEASURE CENTER

Brain reward (dopamine) pathways

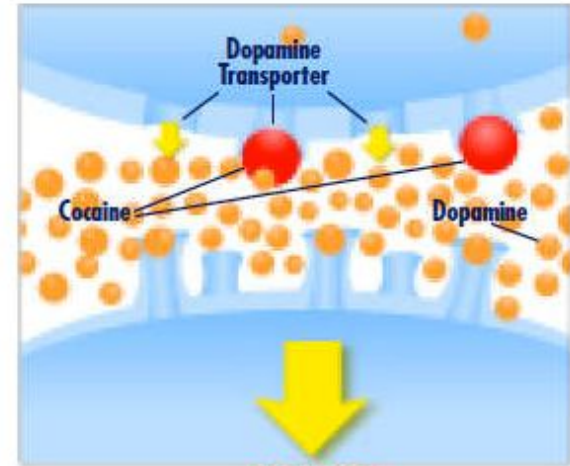


These brain circuits are important for natural rewards such as food, music, and sex.

Drugs of abuse increase dopamine



FOOD



COCAINE

Typically, dopamine increases in response to natural rewards such as food. When cocaine is taken, dopamine increases are exaggerated, and communication is altered.

National Institute on Drug Abuse

- Addiction to a drug is related to how a drug increases levels of the naturally-occurring neurotransmitter dopamine.
- Use of addictive drugs floods the brain with dopamine - taking it up to as much as 5 or 10 times the normal level.
- Over time, by artificially raising the amount of dopamine our brains think is "normal," the drugs create a need that only they can meet.

The addiction issues related to technology are really beginning to surface now.

[About Sustainable Use](#)

[Signs and Symptoms of
Addiction](#)

[Personal stories](#)

[Recovery Stories](#)

[Recommended Reading](#)

 [Virtual Reality \(VR\)
is it addictive?](#)

[What is VR?](#)

[VR Addiction](#)

[Research VR](#)

 [Gaming](#)

[What is IGD?](#)

[Research Videogame](#)

 [Internet Use \(IGD\)](#)


[What is IAD?](#)

[Research IAD and IGD](#)

 [Smartphones](#)

[Excessive Texting](#)

[Research Cell Phone](#)

 [Process Addictions](#)

[What is a Process
Addiction?](#)

[Problematic Gambling](#)

[Screening Tools](#)

discover

LIFE

not your device

Residential Treatment for Problematic Use

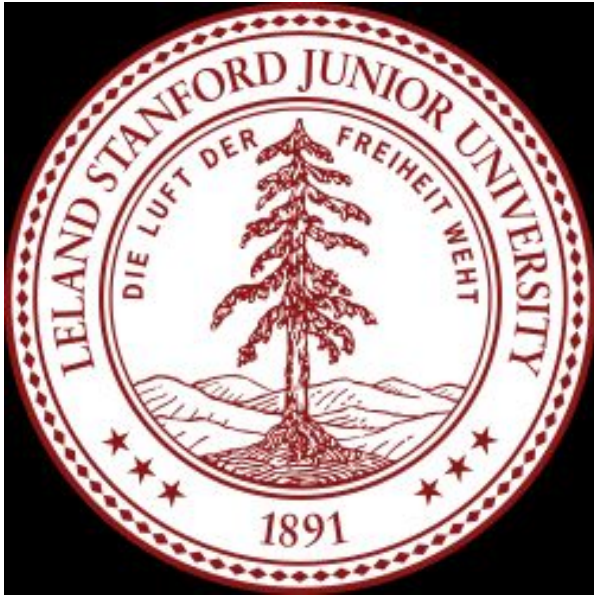


What does science tell us
about the use of technology in
teaching and learning?



“There is a computer disease that anybody who works with computers knows about. It's a very serious disease and it interferes completely with the work. The trouble with computers is that you 'play' with them!”

Richard P. Feynman



Team of Researchers at Stanford
University's Communication
Between Humans and Interactive
Media Lab.

“We all bet high multitaskers were going to be stars at something...”

“It turns out multitaskers are terrible at every aspect of multitasking.”

“They’re suckers for irrelevancy. Everything distracts them.”



Patricia Greenfield

UCLA distinguished professor of
psychology and director of the
Children's Digital Media Center,
Los Angeles

"Wiring classrooms for Internet access does not enhance learning."

"If you are doing a task that requires deep and sustained thought,
multi-tasking is detrimental."

"Technology is not a panacea in education, because of the skills that are being lost."

"Although the visual capabilities of television, video games, and the Internet may develop impressive visual intelligence, the **cost** seems to be deep processing: **mindful knowledge acquisition, inductive analysis, critical thinking, imagination, and reflection.**"



Jordan Grafman, Director of Brain Injury
Research at the Rehabilitation Institute of
Chicago

“The more you multitask, the less deliberate you become;
the less able to think and reason out a problem.”

Sherry Turkle - Director,

MIT Initiative on Technology and Self



“In today’s workplace, young people who have grown up fearing conversation show up on the job wearing headphones”

“Walking through a college campus or the campus of a high-tech startup, one sees the same thing.”

Researchers at University of Michigan



“College kids today are about 40 percent lower in empathy than their counterparts of 20 or 30 years ago”

“The numbers plunged primarily after 2000.”

The study included almost 14,000 college students over the last 30 years.

So what are the schools doing with all this knowledge?

Smart Schools Bond Act



“providing students access to the latest technology and connectivity needed to succeed and compete in the global economy”

So, what do we do?

Tech Refuseniks

Leading the pushback from the Silicon Valley



Loren Brichter
(creator of pull-to-refresh
interactions)

“I’ve spent many hours and weeks and months and years thinking about whether anything I’ve done has made a net positive impact on society or humanity at all.”

“Pull-to-refresh is addictive. Twitter is addictive. These are not good things. When I was working on them, it was not something I was mature enough to think about.”

“The short-term, **dopamine**-driven **feedback loops** we’ve created are destroying how society works”

“No civil discourse, no cooperation; misinformation, mistruth. And it’s not an American problem—this is not about Russians ads. This is a global problem.”

“And I don’t have a good solution. My solution is I just don’t use these tools anymore.”



Chamath Palihapitiya

(former head of AOL’s instant messaging division ; former vice president of user growth at Facebook)

“And don’t think, ‘Oh yeah, not me, I’m fucking genius, I’m at Stanford.’ You’re probably the most likely to fucking fall for it. ‘Cause you are fucking check-boxing your whole Goddamn life.”

Chamath addressing a room full of Stanford students





Tristan Harris

Former Design Ethicist at Google

Co-Founder & Executive Director -
Center for Humane Technology

“Never before in history have such a small number of designers – a handful of young, mostly male engineers, living in the Bay Area of California, working at a handful of tech companies – had such a large influence on two billion people’s thoughts and choices.” Tristan Harris

Conclusion

The race for attention powered by digital technologies is eroding the pillars of our society



Mental Health

The race to keep us on screen 24/7 makes it harder to disconnect, increasing stress, anxiety, and reducing sleep.

Our Children

The race to keep children's attention trains them to replace their self-worth with likes, encourages comparison with others, and creates the constant illusion of missing out.

Social Relationships

The race for attention forces social media to prefer virtual interactions and rewards (likes, shares) on screens over face-to-face community.

Democracy

Social media rewards outrage, false facts, and filter bubbles – which are better at capturing attention – and divides us so we can no longer agree on truth.

“If we gain an understanding of the history, social effects and psychological biases of technology, then our children may grow to be adults who use technology rather than be used by it.”

Clark and Postman

Recommended Reading

1. **“What the Luddites Really Fought Against”**

<http://www.smithsonianmag.com/history/what-the-luddites-really-fought-against-264412/?no-ist=&page=2>

2. http://www.cdmc.ucla.edu/For_Parents_and_Educators_files/greenfield_science_2009.pdf

4 <http://appleinsider.com/articles/14/09/17/tim-cook-touts-new-apple-privacy-policies-in-open-letter-to-customers>

5. <http://www.nytimes.com/2013/11/07/business/clifford-nass-researcher-on-multitasking-dies-at-55.html>

6.

http://pediatrics.aappublications.org/content/early/2010/10/11/peds.2010-1154?sso=1&sso_redirect_count=1&nfstatus=401&nftoken=00000000-0000-0000-0000-000000000000&nfstatusdescription=ERROR%3a+No+local+token

7. <http://www.nytimes.com/2010/06/27/fashion/27StudiedEmpathy.html>

8. <http://www.mit.edu/%7Esturkle/>

https://www.nytimes.com/2014/09/11/fashion/steve-jobs-apple-was-a-low-tech-parent.html?_r=0

<http://uk.businessinsider.com/screen-time-limits-bill-gates-steve-jobs-red-flag-2017-10?r=US&IR=T>

<http://www.nytimes.com/2011/10/23/technology/at-waldorf-school-in-silicon-valley-technology-can-wait.html>

<http://uk.businessinsider.com/sherry-turkle-why-tech-moguls-send-their-kids-to-anti-tech-schools-2017-11?r=US&IR=T>

<http://captology.stanford.edu/>

<https://www.theguardian.com/technology/2017/oct/05/smartphone-addiction-silicon-valley-dystopia>

<https://www.theatlantic.com/magazine/archive/2017/09/has-the-smartphone-destroyed-a-generation/534198/>

<https://netaddictionrecovery.com/>

<https://www.ny.gov/programs/smart-schools-ny>

http://www.nicholascarr.com/?page_id=16

http://www.nicholascarr.com/?page_id=18

<http://www.alonetogetherbook.com/>

<http://www.reclaimingconversationbook.com/>

<https://www.amazon.com/Rise-Robots-Technology-Threat-Jobless/dp/0465097537>

<http://www.timwu.org/AttentionMerchants.html>