Screen Time & Development

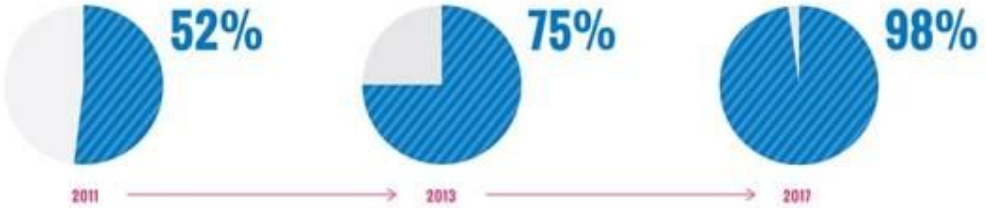
Increased Screen Time

Research studies:

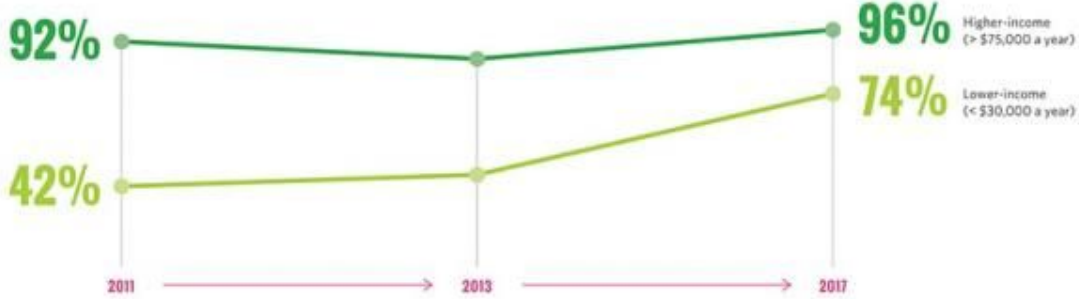
In 2011- children under 9 years old- 38% were using tablets or smartphones, by 2013 it increased to 72%. Also found by 2013, 40% of children under the age of 2 were using tablets or smartphones before they could speak (2)

EVOLUTION OF MEDIA USE BY KIDS AGE 8 AND UNDER 2011-2017

Mobile is universal. *Among 0- to 8-year-olds, percent of homes with a mobile device*



The digital divide has narrowed, but remains an issue. *Among 0- to 8-year-olds, percent of homes with high-speed internet access*



Increased Screen Time

In 2014, researchers from Georgetown University found:

- Children from birth to 23 months watch 55 minutes/ day
- Children age 2 to 4 watch 90 minutes/ day (17)

In 2015, Common Sense Media completed a study to explore 8- 18 year olds use of media. Based on a sample size of more than 2,600 American youths.

- Children age 13 to 18 average about nine hours (8:56) of media use daily.
- Children age 8 to 12 average about six hours' (5:55) of media use daily. (3)

Increased Screen Time

- 56% of the children had their own social media accounts
    - average age to begin a social media account was 12.6 years.
- 80% of all 13- 18 year olds had their own social media account
- 39% of 13-18 years engage in passive consumption, 26% is communication, 25% is interactive consumption, and 3% is creating content. (3)

Healthy Brain Development

According to Harvard University Center for the Developing Child:

- The brain begins to develop in utero and continues into adulthood.
- In the first three years of a child's life, there are periods when the brain forms more than 1 million new neural connections per second. New neural connections and pruning (removing unnecessary connections) allows the pathways in the brain to be more efficient.
- The early years are the most active period for establishing neural connections (5)

Healthy Brain Development

By the age of 2, vision and hearing is developed, language is rapidly developing and higher order reasoning and cognitive functions are at the beginning of development.

Emotional well-being and social competence for the young child provide a strong foundation for higher level cognitive abilities, memory, and executive functioning skills. (5)

https://www.youtube.com/watch?v=LmVWOe1ky8s

Research: Adverse Effects

- Research shows repetition of material/ experiences, making connections between materials/ experiences, interactive experiences, and play help children increase language, attention, social/ emotional skills, cognitive skills, and memory.
- Researchers caution parents to ensure repetition, making connections through interactive experiences, and play are not replaced by digital media but digital media is limited and used as a tool to be used with parents. (17)

Research: Adverse Effects

- Studies have shown psychological difficulties including **hyperactivity, emotional problems**, and **difficulties with peers** have been associated with 2 or more hours a day of screen time for school-age children. (11)
- A study by Stanford University found that girls ages 8-12 that use social media heavily are l**ess happy and more socially uncomfortable** than their peers. (12)

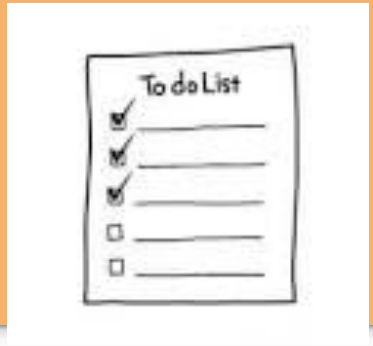
Research: Adverse Effects

- Use of computers and mobile phones in the bedroom are related to **poor sleep habits** (8)
- Studies have shown that using blue light emitting screen devices like smartphones before bedtime can disrupt sleep patterns by suppressing secretion of the hormone melatonin (9)
- **Poor Sleep habits= lower memory, deteriorated verbal cognitive performance, decreased ability to learn** (9)

Research: Adverse Effects

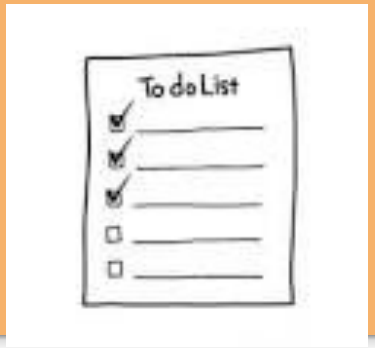
- Children who spend multiple hours are at risk of developing **vision-related problems** such as computer vision syndrome (10)
- They are also at risk for **obesity-** Media exposure has been linked to an increase in food intake, a reduction of physical activity, and exposure to poor quality food. One study showed that middle-class preschoolers who watched TV had higher-body fat; An extra hour of watching TV was associated with an extra 2lbs (1kg) or body fat. (11)

Recommendations...
American Academy of Pediatrics



1. For children under 18 months old: no screen time other than video chat
2. For children 18 to 24 months old: parents should introduce only high-quality media and watch it with their child
3. For children 2 to 5 years old: one hour per day of high-quality programming is recommended, with parents watching along
4. For children ages 6 and older, consistent limits on time and the type of media. Must not take the place of sleep or physical activity (16)

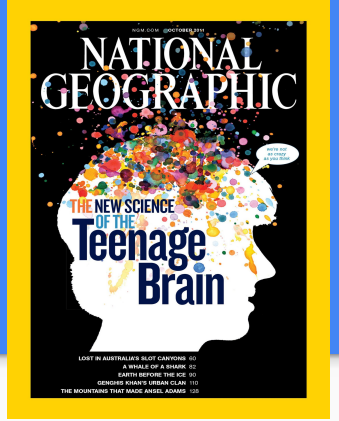
Things to Consider



According to news and research from Harvard Medical School, Pediatrician Michael Rich believes much of what happens on screen provides impoverished stimulation of the developing brain compared to reality. Children need a diverse menu of online and offline experiences, including the chance to let their minds wander.

He stated, “*Boredom is a space in which creativity and imagination happen*” (13)

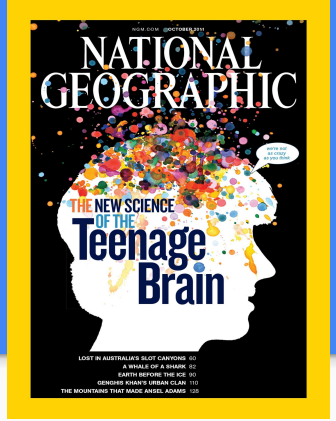
The Teenage Brain



National Institutes of Health (NIH) project that studied over a hundred young people as they grew up during the 1990s—showed that our brains undergo a massive reorganization between our 12th and 25th years (15).

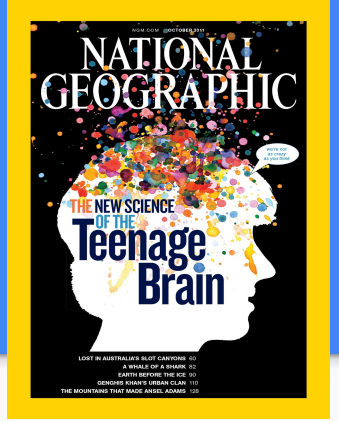
- The **axons**—the long nerve fibers that neurons use to send signals to other neurons—become **gradually more insulated** with a fatty substance called myelin (the brain's white matter), **that increases transmission speed up to a hundred times.**
- The **dendrites-** the branch-like extensions that neurons use to **receive signals from nearby axons, grow twiggier, making it a better receiver**. (6, 7)

The Teenage Brain



- **Most heavily used synapses**—the little chemical junctures across which axons and dendrites pass notes—**grow richer and stronger**. **Synapses that see little use are pruned.**
- **Brain's cortex**—the outer layer of gray matter where we do much of our conscious and complicated thinking- **becomes thinner but more efficient.**
- **Corpus callosum**- connects the brain's left and right hemispheres and carries traffic essential to many advanced brain function- **steadily thickens**. (6, 7)

The Teenage Brain



- **Hippocampus-** a sort of memory directory- **forms stronger links** to the frontal areas that set goals and weigh different agendas
- **Frontal areas**- develop **greater speed and richer connections**

Making the entire brain a much faster and more sophisticated organ.

“When this development proceeds normally, we get better at balancing impulse, desire, goals, self-interest, rules, ethics, and even altruism, generating behavior that is more complex and, sometimes at least, more sensible. But at times, and especially at first, the brain does this work clumsily” David Dobbs, National Geographic (6)

Teenage Brain: Internet/Gaming Addiction

- Research states, based on MRIs, there has been shrinkage in the part of the brain (gray matter) where **processing** occurs.
- The frontal lobe which governs **executive functions**, such as planning, prioritizing, organizing, and impulse control were affected.
- Volume loss was also seen in the striatum, which is involved in **reward pathways and** the **suppression of socially unacceptable impulses**. (14)

Teenage Brain: Internet/Gaming Addiction

- Damage to an area involved in our **capacity to develop empathy and compassion for others** and our **ability to integrate physical signals with emotion.**
- Screen time is linked to “spotty” white matter. White matter is the part of the brain that controls the **communications between** in the brain. It also connects networks from the brain to the body and vice versa. Body functions we are unaware of like **blood pressure and heart rate**. Interrupted connections may slow down signals, “short-circuit” them, or cause them to be erratic (“misfire”).(14)

Further Implications for Adolescents

- Studies show that when video games are being played, the brain produces a natural substance called dopamine which your body craves. The changes in the brain caused by this release of dopamine are similar to what happens when a person craves drugs. (14)
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- “Games and social media work on a variable reward system. A young person’s brain lacks a fully developed self control system to help them with stopping this kind of obsessive behavior.”Debrah Bradley Reuter, Harvard Medical School News and Research(13)

Further Implications for Adolescents

Adolescents are at risk for:

- Poor homework completion
- Negative attitudes toward school
- Poor grades
- Long-term academic failure
- Obesity
- Sleep problems
- Cyberbullying
- Poorly developed interpersonal skills (11,16)

Recommendations...
American Academy of Pediatrics

- For children ages 6 and older, consistent limits on time and the type of media. Must not take the place of sleep or physical activity
- Designate media- free times together and media free locations
- No screens 1 hour before bedtime, and remove devices from bedrooms before bed
- Consult the American Academy of Pediatrics Family Media Use Plan, available at: www.healthychildren.org/MediaUsePlan (16)

Controversy and Debate

There is much controversy and debate regarding the impact of screen time on development.

- The complexity of the brain and the specificity of the media it is subjected to is yet to be studied long- term.
- Consider the type of screen time the child is using (passive consumption, interactive consumption, communication, or content creation) (3)
- Impact social constructs have on children today
- Limited research has been completed due to the fast pace rate of technology availability and creation.

Future Data & Research

The Adolescent Brain Cognitive Development (ABCD) study: longitudinal approach including 11,878 children between the ages of 8 and 11 years old. This study will look at many childhood experiences that affect brain, social, emotional, and cognitive development. This will include the impact of digital media.(15)

The Growing Up Digital (GUD) study: 3,000- 5,000 youths in Canada over 10 years. It will examine the impact of digital technology on their physical mental and social well being.(13)

Next Steps

- Be informed as the research studies release findings
- Limit screen time & avoid having TV on in the background
- Use of high quality screen time
- Spend time with your child and help them to navigate digital media and social media
- Help your child bridge the gap between content they are exposed to on screen and their real-life experiences
- Follow the American Association of Pediatrics guidelines
- Look into creating a Family Media Use Plan

Resources

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(10) Heiting, Gary. (2019). Children and technology: Protecting your child's eyes. Retrieved from: https://www.allaboutvision.com/parents/children-computer-vision-syndrome.htm

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(13) Bradley Reuter, Debrah. (2019). Harvard Medical School News and Research. Screen Time and the Brain. Retrieved from: https://hms.harvard.edu/news/screen-time-brain

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(15) National Institute of Health. (2017). NIH releases first dataset from unprecedented study of adolescent brain development. Retrieved from: https://www.nih.gov/news-events/news-releases/nih-releases-first-dataset-unprecedented-study-adolescent-brain-development

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