Key Takeaways

Children and Screens *Pediatrics* Supplement

"Children, Adolescents and Screens: What We Know and What We Need to Learn"

Cognitive[i]

- **Early Childhood:**
  - Infants are exposed to large amounts of screen media well before they are able to comprehend the content. This exposure (especially television) is distracting to the infants and disrupts their behavior and sustained toy play. Television and interactive screen media (such as smart phones) distract parents and reduce the quality of parent-child interactions. The development of language and attentional skills are negatively associated with amount of screen media exposure before 2 years of age.
  - Once children can comprehend screen media content (by about 2 ½ years) television and interactive screen media can influence their knowledge. Educational media have been shown to be effective in enhancing educational knowledge and skills, but what remains unclear are the best methods of using screens to teach very young children, while at the same time ensuring socio-emotional, sensory, and physical (motor skills) development.

- **Mid-childhood, Adolescence:**
  - Use of violent entertainment media is associated with impulsive and aggressive behavior which in turn may induce problems at home, in school, and with friends.
  - Computer games and other types of software can enhance particular cognitive skills if those skills are necessary to successfully play the games or use the software. More research needs to be conducted on short and long-term impacts on executive function (e.g. attention and control of cognitive function).
  - Interactive screen media can have positive or negative impacts, depending on the age, developmental stage and temperament of the child, dose of media use, content and type of device, and how the child is using it. More research needs to be conducted about digital media's effects on critical thinking, one's ability to focus, attention, conceptualization, working memory and short- and long-term memory.

Media Multitasking[ii]

- Researchers are finding that how many media streams one simultaneously juggles ('media multitasking') is related to differences in brain and behavioral profiles.
- Compared to lighter media multitaskers, heavier media multitaskers show differences in cognition (e.g., poorer attention and memory), psychosocial behavior (e.g., increased impulsivity), and brain structure (e.g., reduced volume in a part of the brain that is associated with controlling one's thoughts and emotions). Furthermore, research indicates that multitasking with media during learning (in class or at home) can negatively affect academic outcomes.
- We do not yet know whether heavier media multitasking is causing these cognitive, psychological, neural, and learning differences, or whether people with these pre-existing differences tend to media multitask more heavily. Until this is known, we would be wise to be thoughtful about the amount of media multitasking in ourselves, our students, and our children.

Social Media[iii]

- Social media are used for a variety of activities, including sharing information, self-presentation, and interacting with others. Adolescents, who are highly attuned to peer relationships, find the social component of many of these platforms especially compelling, and majority report using them.
- Research on adolescents' social media use suggests both benefits and costs. With regard to benefits, research has found that when young people use social media, it helps them reach key milestones, such as creating their identities and goals and engaging with peers. By and large, today's online environments reflect, complement, and reinforce what is happening in offline environments.
- Social media use during adolescence can have negative effects on adolescents' health and development. Most adolescents say that social media is a positive force in their lives, but more negative effects have been documented, including cyberbullying, depression, social anxiety, and exposure to developmentally inappropriate content. Additionally, ads for sexual content, alcohol, and other unhealthy products can easily reach children and adolescents via social media.

Youth Well-being[iv]

- Digital and social media use is associated with positive well-being and social connectedness outcomes for youth, including those related to self-esteem, social confidence, increased empathy, decreased depression, closeness with friends and family, and opportunities for positive, supportive connections via online communities.
- Digital and social media use is also associated with negative impacts, including lower life satisfaction, increased anxiety and depression, pressures to be constantly available to peers, online vigilance with self-presentation, decreased empathy, and disruption of in-person interactions.
- Varied outcomes associated with digital media use are related to the specific technologies/platforms used, how often and in what ways they are used by youth, online content to which they are exposed including reactions from online audiences of peers, and other particulars of youths' online experiences.

Anxiety and Depression[v]

- There is much research evidence that various aspects of "traditional" media (TV, movies) can increase children's acute fears, which can result in lingering anxieties and related sleep disturbances that can be difficult to remedy.
- Recent research has begun to deal with the interactive nature of social media and its potential to influence anxiety and depression in youth. Emerging research topics include how social media use relates to anxiety and depression through (a) feelings of inadequacy relative to "friends;" (b) the inability to regulate emotions; (c) fewer face-to-face interactions resulting in skill deficits; (d) worries about being disconnected or left out; and (e) cyberbullying and related behavior. Correlational results have been observed in these areas, but it is premature to make causal connections.
- A growing body of research confirms the relationship between digital media use and depression. Although there is evidence that greater electronic media use is associated with depressive symptoms, there is also evidence that the social nature of digital communication may be harnessed in some situations to improve mood and to promote health-enhancing strategies especially in non-depressed populations. Much more research is needed to explore these possibilities.

Addiction and Internet Gaming Disorder[vi]

- The early science on the idea of internet or video game "addiction" demonstrates that it does seem to be a serious problem for a small subset of youth gamers (between about 1% and 9%). Although this is a small percentage of gamers, the fact that over 90% of children and adolescents play video games in the US means that a substantial number of children are incurring damage to their lives because of how they play.
- Internet Gaming Disorder is currently defined by nine broad symptoms demonstrating dysfunction in social, occupational, educational, family, psychological, and emotional functioning.
- More research is needed to understand the etiology, course, and best treatment approaches.

Virtual Reality[vii]

- The introduction of affordable head-mounted displays (e.g., HMDs like Oculus Rift; Samsung Gear VR; Google Cardboard) makes VR an increasingly popular entertainment and learning medium for a range of user-groups.
- Virtual reality offers great potential for teaching, learning, assessment, and interventions.
- Interdisciplinary research teams, including community stakeholders, are needed to ensure that end-users' needs and priorities are more effectively met in research programs and projects.

Sleep[viii]

- Dozens of studies have shown an adverse association between screen-based media consumption and unhealthy sleep patterns—usually due to later bedtimes and reduced total sleep time.

- How does this happen?
    - Time spent on screen-based devices takes time away from sleep,
    - Psychological stimulation due to media content, and
    - Effects of light emitted from the devices on circadian timing, sleep physiology, alertness.
- Sufficient restorative sleep benefits health, learning, and safety. Further research is needed to identify effective interventions to reduce the adverse effects of screen time on children's sleep.

Obesity[ix]

- A large body of research has demonstrated the relationship between greater amounts of screen media use — television, video games, and computers — and obesity in children and adolescents.
- Randomized controlled trials of behavior change programs in schools and families to reduce time spent on screens have reduced weight gain in children, demonstrating a cause-and-effect relationship.
- The evidence to date suggests that screen media exposure leads to obesity in children and adolescents via three main mechanisms: increased eating while using screens, leading to greater calorie intake; seeing advertising for high-calorie, low-nutrition foods and beverages that alters children's preferences, purchase requests, and eating habits; and disrupting sleep.

Driving Safety[x]

- Teen driver laws should be written to keep digital distractions in cars to a minimum.
- Automakers should be required to give drivers easy access to disable infotainment features in the car.
- Game and app makers for smartphones should design products for mobile devices that will turn off or disable themselves if they detect that the user is driving.

Parenting[xi]

- Media use interacts with all levels of the child's context: the child's traits, their family dynamics, their school and community, and their larger culture — and media therefore needs to be researched taking these child-specific contextual factors into account.
- The *how* of media use — who watches with the child, how they interact during and after viewing media together, and how the parent helps the child understand media — is just as important as the *what* (content) and *how much* (screen time) of media use.
- Although media has been shown to distract family members from interacting with each other, more needs to be known about how digital media can help promote more family engagement and connection.

Privacy[xii]

- Media and advertising industries are creating new ways to track young people's behaviors and target content and messages. These invasive practices could pose serious threats to children's privacy, leading to the creation of "digital dossiers" that "stick" to young people over time and impede their access to education, jobs, healthcare, or finances.
- Although much of academic research on children's privacy has focused on the safety risks involved in sharing personal information on the internet, children's privacy cannot be fully understood or adequately addressed without taking into account the market forces that shape contemporary digital

media. Research on children and privacy has not kept pace with the evolution of media, advertising, and technology taking place globally. Scholars, therefore, need to develop new approaches to understanding the complex ways that children and adolescents engage with commercial media culture.

- Researchers from a range of fields and disciplines must collaborate to study how privacy relates to developmental issues as well as how digital media is being strategically designed to influence young people. Even more broadly, scholars, advocates, health professionals, parents, and youth themselves should work together to develop a set of principles and policies that will balance young people's ability to participate fully in the digital media culture — as producers, consumers, and citizens — with government's and industry's obligation to ensure that they are treated with fairness and dignity.

Digital Media Literacy[xiii]

- We must close the gap between real-world, interconnected learning and the formal structures of school so that children are prepared for lifelong learning and equipped with the skills they need to access, analyze, evaluate, create and participate in society through digital technologies.
- We must invest in the literacy practices of our youth to create the human capital necessary for success and sustainability in a technology-driven world.
- Research and policy actions that support digital and media literacy are imperative; we need to move quickly to address outdated modes of assessment, individualized learning (rather than one-size-fits-all), and new intellectual property frameworks appropriate to education in a digital age; and research needs to provide insight into: identifying the knowledge and skills called for with digital and media literacy; closing the digital use divide; and investigating connections between in-school and out-of-school learning and civic engagement.

Civic Engagement[xiv]

- In addition to exposing adolescents to risk, technology use also provides opportunities for adolescent development.
- Online practices such as information seeking, social network site use, and participation in online communities promote civic engagement, which in turn can support positive youth development.
- Bolstering digital media competences can help adolescents manage the risks of online participatory politics while benefiting from the opportunity to exercise their voice and create positive social ties.

Digital Inequality[xv]

- Overexposure to media and technology is a concern for children's development, but so is unequal access to technology and the social opportunities that are made available by connecting to them. Lower-income children in the U.S.— who are disproportionately children of color and/or children of immigrants — are most affected by digital inequality.
- Providing lower-income immigrant and minority children with access to technology increases their self-efficacy in mathematics and science by enhancing learning through active engagement, participation in groups, frequent interaction and feedback, and real-world connections.

- Consistent Internet connectivity outside of school supports children's learning and development by maintaining the out-of-school access to teachers and peers that is critical to subject mastery and school success. Consistent connectivity also provides opportunities for *interest-driven learning* — the learning activities that foster joy, motivation, and self-confidence.

Global Perspectives[xvi]

- We cannot understand children's engagement with digital media without taking into account their life contexts. Socioeconomic, cultural, demographic, technological, geographical, political, and religious factors all play a significant role in influencing the meaning and impact of their engagement with digital media. Therefore, we require additional cross-cultural and multidimensional research worldwide, especially in the face of globalization and intensifying media use.
- There is an urgent need for collaboration among all stakeholders — parents, educators, policy-makers, media organizations, medical organizations, international organizations, and children themselves — to work towards the goal of maximizing positive digital opportunities for children worldwide, especially in relation to children's education and participation. This is important to the UN Sustainable Development Goals, and it goes far wider than working for internet safety.
- In designing national policies, including ways that parents and teachers can mediate and support children's digital engagements, it is important to draw on research evidence that can guide the balance — in policy and practice between concerns for potential harms and hopes for the benefits that digital media use may bring.

Violent Content[xvii]

- Exposure to violent media is not simply a harmless form of entertainment. Hundreds of studies have shown that exposure to violent media is a risk factor for aggressive and violent behavior, and can make people numb and less likely to help others.
- Video games are not inherently "good" or "bad." Video games are tremendous teachers that can have positive or negative effects, depending on their content and on how much time children spend playing them.
- Exposure to violent video games is not the only risk factor for aggressive and violent behavior, or even the most important risk factor, but it is not a trivial factor either. Importantly, exposure to violent media is one of the few risk factors parents can control.

Cyberbullying[xviii]

- Cyberbullying is not separate from school; in fact, it often interacts with traditional, in-school bullying. The older the child, the more likely it is that cyberbullying is involved with in-school problems.
- Cyberbullying can have a significant emotional impact upon children and teens. Unlike traditional bullying, a target cannot escape cyberbullying at the end of the school day. The bullying can follow a target everywhere.
- Although cyberbullying is clearly more common among older children, it occurs even in elementary school, where recent research suggests that 50% of children own smartphones and those children may be at higher risk of involvement in cyberbullying.

Advertising and Marketing[xix]

- The average American child is exposed to tens of thousands of commercial messages each year across an array of media platforms (e.g., television, online environments).
- Children's advertising exposure has been linked to less healthy food consumption, increased materialism, increased parent-child conflict, and negative body image among girls.
- With children and adolescents turning to new media platforms for their media use, there are fewer safeguards in place to monitor their advertising exposure.

Stereotypes[xx]

- Research demonstrates that the stories about race, gender and other social categories we watch on our screens do matter, for better and for worse. When the screen is on, children are learning.
- The stories on our screens are mostly about the dominant group, which is middle class, straight, white males. Stories about members of marginalized groups such as racial and religious minorities, females, people with disabilities, and people with diverse sexual orientations rely too much on stereotypes and tend to focus on single aspects of the person.
- Children are attached to their screens more than ever. At the same time, the divide in this country is based largely on misunderstandings and disagreements about the various social groups. We have an obligation and an opportunity to use our screens to make a difference in how we understand and treat each other.

Sexual Media[xxi]

- Teenagers' beliefs, attitudes, behavior and health can be influenced by sexual content in the media.
- Digital media create the potential for greater access and participation and may thus expand both the negative and positive potential of sexual media's influence.
- Sexting and pornography are important issues affecting teenagers and need to be more thoroughly researched and dealt with by parents and by schools.

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