Research Summaries

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

Digital Screen Media and Cognitive Development

Daniel R. Anderson, Kaveri Subrahmanyam

Media used by children have long been thought to have both positive and negative effects on knowledge and cognitive skills. With respect to screen media, most research concerns television, but there has been a growing amount of work on interactive screen media, including computers, gaming consoles, and mobile screen devices. The impact of media use on infants under 2 years of age is different than it is on older children because infants and toddlers are largely not able to comprehend the media content. Screens have a distracting effect on infants and parents and interfere with parent-child interactions. Screen exposure in infancy is associated with poorer language and cognitive development. From about 2 years of age and older, children become increasingly able to comprehend screen media content. As a consequence, educational media can effectively teach knowledge and cognitive skills. A large amount of research has found a positive impact of educational screen media on cognitive development. Entertainment television and computer games, on the other hand, may have a negative impact, especially while children are learning to read. This negative impact is likely due to time displacement of entertainment reading during ages when reading is still difficult. Use of entertainment media with violent content, moreover, is associated with impulsive and aggressive behavior that in turn can create problems in school. Games played on computers and other screen devices can enhance specific cognitive skills if successful game play teaches and exercises those skills. Overall, screen media have both positive and negative effects on cognitive development depending on children's age and the type of content consumed.

Media Multitasking and Cognitive, Psychological, Neural, and Learning Differences

Melina R. Uncapher, Lin Lin, Larry D. Rosen, Heather L. Kirkorian, Naomi S. Baron, Kira Bailey, Joanne Cantor, David L. Strayer, Thomas D. Parsons, Anthony D. Wagner

Estimates of media use among teens are staggering: approximately eight hours, or one-third of each 24-hour day, is the average amount of time a teen engages with media. A large portion of this time is spent using multiple media simultaneously, or "media multitasking." Researchers are beginning to find signs that multitasking is associated with lower cognitive ability, impulsivity, and social deficits. Investigations are also beginning to reveal differences in brain structure between individuals who multitask frequently and those who multitask occasionally or rarely.

Learning environments are not exempt from media multitasking, as 91% of university students text while in class, and children as young as age five multitask while doing homework. Media multitasking has been shown to negatively impact the quality of learning, with speed, accuracy, and depth of learning all reduced in quality when students attempted to multitask. Even one-year-olds who were exposed to background television noise showed lower attentional control at age four than those who were not exposed.

Researchers are just beginning to investigate the impacts of media multitasking upon learning, and the need for more research continues to escalate. As media usage becomes increasingly ubiquitous among teens, new findings will help with increasing understanding and developing strategies for addressing media multitasking among teens.

Benefits and Costs of Social Media in Adolescence

Yalda T. Uhls, Nicole B. Ellison, Kaveri Subrahmanyam

Adolescents use social media for many reasons, and that use has benefits and costs. Some research shows that social media use can help adolescents reach crucial developmental milestones, such as developing identities and goals and engaging with peers. Social media can provide a good forum to practice skills related to identity development, such as self-presentation and self-disclosure. Research suggests that adolescents use social media to develop and maintain friendships. Social media use may also have positive effects on self-esteem, increase youths' social connections and support, and give them safe ways to explore their identities. Social media use is not without some costs; research has also shown some negative associations, including cyberbullying, depression, and anxiety. Other costs include objectified self-concepts, references to high-risk behavior such as sexual activity, substance abuse or violence, and exposure to inappropriate content (e.g., drinking), as well as peer validation of displays of such content.

Digital Life and Youth Well-being, Social-connectedness, Empathy, and Narcissism

Carrie James, Katie Davis, Linda Charmaraman, Sara Konrath, Petr Slovak, Emily Weinstein, Lana Yarosh

Digital media are woven into the fabric of most young people's lives today. This social fact raises concerns about the varied impacts of frequent (often ongoing) engagement on social network sites and communicating with peers, family, and others through text messaging and apps. This article distills findings from research focused on digital life's impacts on youth (especially adolescent) well-being, social connectedness, empathy, and narcissism. Studies suggest a mixed picture regarding well-being outcomes. Some studies find social media use is associated with increased self-esteem, social confidence, and reduced depression, while others point to lower life-satisfaction and other ill-being indicators. The nature of media use, content, platforms, and experiences with peers are important mediators of outcomes. Digital media positively contribute to social connectedness in facilitating existing relationships and new connections around shared interests and struggles, including medical conditions. On the negative side, pressures to be always available to peers via digital devices can cause stress. Further, mobile phones can interfere with or undercut the quality of in-person interactions. Connections between digital life and empathic or narcissistic personality traits are unclear. Studies variously suggest that social media usage can be associated with narcissism and with higher or lower empathy scores. This review suggests further research is needed to understand how, where, when, and for whom digital media contribute to positive vs. negative personal and social well-being outcomes. Research designs that include direct observation of digital media use, consideration of contextual and individual factors, and which uncover key causal mechanisms at play are warranted. The article also suggests a need for investigations of how different educational curricula, school policies, and parenting approaches support or undercut well-being outcomes. Recommendations for pediatricians include nuanced discussions of media usage during clinical visits. For educators and policymakers, well-being issues should be addressed as part of digital citizenship initiatives.

Digital Media, Anxiety, and Depression in Children

Elizabeth Hoge, David Bickham, Joanne Cantor

There have always been concerns about the impact of media on children's mental health, and these concerns have been growing with the advent of newer technologies, which allow children to have access to an even wider array of content in an interactive format. The impact of "traditional" media on children's fears and anxieties has been studied for decades. There is ample evidence that TV and movies (including news broadcasts) can increase children's fears and anxieties and often result in long-term anxieties and sleep disturbances. There is a great deal of current interest in the potential of newer media, especially social media, to increase children's level of anxiety and depression. Emerging research topics include (a) whether exposure to other people's social media postings promotes anxiety and depression by making other people's lives seem more fun and exciting than theirs; (b) whether dependence on social media increases anxiety by reducing the ability to regulate one's emotions; (c) whether the use of social media increases anxiety and depression by reducing face-to- face interactions resulting in skill deficits; (d) whether anxiety increases due to worries about being inadequately connected to peers or being left out; and (e) whether anxiety, depression, and suicide occur as the result of cyberbullying and related behavior. Correlational results have been observed in these areas, but it is premature to determine the direction of causality.

While growing evidence substantiates a link between digital media use and symptoms of depression, research also suggests that digital communication could be used as a social tool to improve mood and to promote healthy behaviors—especially in people who are not depressed.

Internet Gaming Disorder in Children and Adolescents

Douglas A. Gentile, Kira Bailey, Daphne Bavelier, Jeanne Funk Brockmyer, Hilarie Cash, Sarah Coyne, Andrew Doan, Donald S. Grant, C. Shawn Green, Mark Griffiths, Tracy Markle, Nancy M. Petry, Sara Prot, Cosette D. Rae, Florian Rehbein, Michael Rich, Dave Sullivan, Elizabeth Woolley, Kimberly Young

Internet Gaming Disorder (IGD) was recently included by the American Psychological Association as a potential psychiatric diagnosis, with the recommendation that further study was necessary to understand it better. Using measures based on or similar to the IGD definition, between about 1% and 9% of gamers would be classified as having the disorder, depending on age, country, and other sample characteristics. How IGD starts is not well-understood at this time, although it appears that impulsiveness and high amounts of time gaming may be risk factors. IGD appears likely to be co-morbid with other mental health problems, such as depression, social phobias, and anxiety, and some evidence suggests that IGD can make those problems worsen. How long the disorder lasts vary widely, but it is unclear why. To date, no randomized controlled trials exist that indicate that IGD is treatable. More research is needed to discover how IGD starts, and evidence-based ways to treat it. This paper highlights important areas for future research and offers recommendations for clinicians, policymakers, and educators.

Virtual Reality in Pediatric Psychology

Thomas D. Parsons, Giuseppe Riva, Sarah Parsons, Fabrizia Mantovani, Nigel Newbutt, Lin Lin, Eva Venturini, Trevor Hall

Pediatric interventions often aim at functional enhancements through reestablishing previously learned behavior patterns or establishing new patterns of activity. Recent advances in virtual reality technologies allow for controlled presentations of emotionally engaging background narratives to assess and train cognitive processing, affective experience, and social interactions. Virtual reality has the potential to be used as a tool to help teachers, therapists, neuropsychologists, and others make reliable interventions that can aid assessments and enhance learning for children, including those with disabilities. For example, virtual reality may be able to help children learn to control their anxiety in response to certain aversive stimuli. However,

while virtual reality offers some purported advantages, the field faces several challenges: One is the need to establish the psychometric properties of virtual reality assessments and interventions. Furthermore, a consensus statement and guidelines are needed for ideal use of virtual environments with children and adolescents. It is the working group's consensus that investigations into these future research endeavors have the potential to inform policy, theory, and practices. Specifically, the addition of virtual reality platforms to pediatric assessments and interventions offers an opportunity for advancing our understanding of the cognitive, affective, psychosocial, and neural aspects of children as they take part in real-world activities.

Digital Media and Sleep in Childhood and Adolescence

Monique K. LeBourgeois, Lauren Hale, Anne-Marie Chang, Lameese D. Akacem, Hawley E. Montgomery-Downs, Orfeu M. Buxton

This brief report summarizes the literature on electronic media and sleep and provides research recommendations. This topic is important and timely because of the pervasive and understudied use of screen-based media and the high prevalence of insufficient sleep among American youth and teens. Recent systematic reviews demonstrate that an overwhelming number of studies indicate an adverse relationship between healthful sleep and screen use, because screen time results in later bedtimes and reduced total sleep time. This is likely because time spent on screens takes the place of time spent sleeping, screen use can be psychologically stimulating, and the light from screens can disrupt functions like the circadian clock, sleep physiology, and alertness. However, the current understanding of these processes is limited by cross-sectional, observational, and self-reported data. Further observational, experimental and intervention research is needed to understand how digital media change sleep and circadian rhythms from infancy to adulthood, including how this change may result in poor health, learning, and negative physical outcomes (such as depression, obesity, and risky behaviors) later on, and to establish evidence-based countermeasures to the deleterious effects of screen time on sleep.

Screen Media Exposure and Obesity in Children and Adolescents

Thomas N. Robinson, Jorge A. Banda, Lauren Hale, Amy Shirong Lu, Frances Fleming-Milici, Sandra L. Calvert, Ellen Wartella

A large body of research has demonstrated relationships between greater amounts of screen media use — television, video games, and computers — and obesity in children and adolescents. In fact, obesity is one of the most strongly proven outcomes of screen media exposure. Many studies find that children who spend more time watching or playing with screen media have greater body fatness and obesity than children who spend less time with screen media. Further, several randomized controlled trials of school curricula and family behavior change programs 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: (1) increased eating while using screens, leading to greater calorie intake (2) seeing advertising for high-calorie, low-nutrition foods and beverages that alters children's preferences, purchase requests and eating habits, and (3) disrupting sleep. The effects of newer mobile media exposure on eating, physical activity and obesity needs additional research but is likely to produce similar effects. However, there also are studies suggesting that interactive games can be designed to help improve eating and physical activity behaviors to potentially prevent or reduce obesity. Future research is needed to (1) examine the effects of newer mobile and other digital media exposures on obesity; (2) develop additional interventions to combat the adverse effects of media exposures on obesity, and whether they can be made more effective; (3) most effectively use digital media to prevent and reduce obesity; and (4) uncover how different types of media, media content, and the contexts in which they are experienced, interact to cause obesity and obesity-related behaviors.

Digital Media and Risks for Adolescent Substance Abuse and Problematic Gambling

Dan Romer and Megan Moreno

Our paper reviews the latest evidence regarding adolescent exposure to online content that might encourage the use of substances, such as alcohol and tobacco, and gambling. The research we review suggests that adolescents can be exposed to considerable content that promotes these behaviors. However, the influence that this content has on adolescents is still not well understood. Future research is needed to determine the magnitude of this risk and potential ways of counteracting it.

Small Screen Use and Driving Safety

Paul Atchley and David Strayer

Small screen technology is almost completely pervasive. The apps that go with the hardware are designed by people with a good working knowledge of how to make them capture the attention of an already distracted populace. And when we are driving, areas of the brain that might otherwise tell us to ignore the threat that smart devices and infotainment systems create, is being used for the task of driving. A driver, especially a young driver, has no willpower to ignore the lure of the small screen. The time has come for an approach to this risk that requires designers of the hardware to abide by rules to prevent crashes. It is not enough to say that "people make choices." This was the same logic that led to an epidemic of smoking. What helped to curb that epidemic were rules and laws to make it hard to make a poor choice. And it will require a similar approach in the face of the small screens that are being built to be addictive.

Parenting and Digital Media

Sarah M. Coyne, Jenny Radesky, Kevin M. Collier, Douglas A. Gentile, Jennifer Ruh Linder, Amy I. Nathanson, Eric E. Rasmussen, Stephanie M. Reich, Jean Rogers

Children spend more hours engaging with screens than with any other activity. Research has found that media use can have a host of both positive and negative effects on child development, though it depends on both the time spent and content being consumed. Despite this, many parents do not understand how to help children manage screen time effectively. We examine family media use patterns, parental rules regarding media, the myriad of ways parents talk about media to their children, and parental attitudes regarding media. Each are important in understanding how media might influence child outcomes. We also offer three suggestions for future research. First, we need more research on best practices regarding both traditional and newer forms of media. Second, we need greater understanding on how parents and children use media together and whether this might strengthen or diminish the parent/child relationship. Finally, we are in need of studies that examine the long-term impact of media use on child social, psychological, physical, and emotional outcomes. A greater understanding of the family dynamics surrounding child media use may help children not only survive, but thrive in our current media culture.

Children's Privacy in the Big Data Era: Research Opportunities

Kathryn C. Montgomery, Jeff Chester, Tijana Milosevic

Our article offers an overview of young people's engagement with today's always-on, interactive media culture, focusing particularly on the privacy implications of the advertising that appears on social media, mobile apps, games directed at children, and smart devices. Although much of the public discourse and academic research on children's privacy has focused on the safety risks involved in sharing personal information on the internet, marketing and privacy are inextricably intertwined, especially as Big Data principles and practices continue to transform the digital landscape. As children are now consuming content on a range of digital screens and devices, the media and advertising industries are developing new

measurement systems to track how children and teens engage with content and advertising online. Marketers follow young people and their social networks across the web, regardless of where they are and what device they are using. With the growth of the so-called "Internet of Things," children's daily tools and surroundings are becoming "smart," too, monitoring and analyzing individual and aggregate data and communicating with other objects using embedded sensors. These trends pose serious threats to children's privacy.

Although U.S. privacy law provides some protection for children under 13 online, those safeguards are challenged by increasingly sophisticated marketing and data-collection techniques. And teens' privacy remains wholly unprotected. Thus, scholars need to develop new approaches to understanding the complex ways that children and adolescents engage with commercial media culture. Collaboration among researchers from a range of fields will enable cross-disciplinary studies that address not only the developmental issues related to different age groups, but also the design of digital media platforms and the strategies used to influence young people. Our article concludes with key questions that should serve as a foundation for a larger research agenda, and makes recommendations for proceeding along these lines.

Developing Digital and Media Literacies in Children and Adolescents

Kristen Hawley Turner, Tessa Jolls, Michelle Schira Hagerman, William O'Byrne, Troy Hicks, Bobbie Eisenstock, Kristine E. Pytash

Anywhere, anytime learning that digital and media literacies support is now a fundamental human right that calls for equal access by all. Yet the gap between today's world of education and that of an interconnected world dependent upon quick and ready access to media and information — and the ability to discern and act responsibly — is far apart. Societies are more reliant than ever upon human capital that can contribute to success and sustainability. Yet policies — and the research that informs them — are widening digital and media literacy gaps rather than narrowing them. To inform policy, longitudinal studies that identify the essential knowledge and skills are needed to foster digital and media literacy competencies for lifelong learners. These studies also need to identify pedagogies that emphasize closing a digital use divide that often holds lower-income communities back from full participation in civic and economic life.

Furthermore, research must address the fact that learning happens outside classrooms as well as inside, especially through technology, and that all learning opportunities should be used and leveraged to develop human potential. Educators must be prepared to engage in the practices that have the most impact in a digital age. In the meanwhile, policy makers need not wait: immediate actions can be taken, such as eliminating high stakes testing that contribute directly to rigid and outdated structures of schooling. Furthermore, local officials should be empowered to make decisions about instruction and assessment in schools so that their decisions are informed and appropriate for their communities. Funding structures must change to support research and development and to meet local needs, rewarding innovation and results rather than seat time. Finally, the legal framework governing intellectual property must be challenged and changed, to support the use of adapted and transformative texts that permit the development, recreation and sharing of digital assets.

Digital Media, Participatory Politics, and Positive Youth Development

Ellen Middaugh, Lynn Schofield Clark, Parissa J. Ballard

In this era of concerns about "fake news," polarization and internet extremism, it can be hard to see the advantages of teens involvement in activism or advocacy. However, research suggests that civic and political engagement (activities ranging from volunteering, activism and electoral work) are associated with positive outcomes for youth. When youth have opportunities to work with peers to address community problems, they can develop a sense of purpose, accomplishment, and empowerment. These features of civic identity can serve as a foundation for non-civic outcomes such as school engagement and reduced risk-taking behaviors. This may be particularly important for marginalized youth who can feel helpless in the face of discrimination or lack of access to resources.

As public life moves online, researchers are examining the influence of digital media on the quantity and quality of youth civic engagement, captured under the umbrella term of participatory politics. As with many outcomes, when examining the impact of internet use on participatory politics, it becomes clear that whether youth are online is far less important than what they do online. Practices such as information seeking, social network site use, and participation in online communities organized around common interests have been found to support civic engagement. Digital media also play an important role in helping politically active youth mobilize, draw audience to their voices and perspectives, and to tell their stories in an authentic way.

At the same time youth are leveraging digital tools and networks for political expression and empowerment, they are also exposed to risk. Within the realm of civic engagement, exposure to misinformation and propaganda, emotionally charged and unproductive discourse and hate speech are all potential pitfalls. Educators are responding with media literacy and digital citizenship initiatives, which can help youth tap the potential of the internet while managing risk and working to create more productive models of participatory politics going forward.

Digital Inequality and Developmental Trajectories of Low-income, Immigrant, and Minority Children

Vikki S. Katz, Carmen Gonzalez, and Kevin Clark

Tens of millions of children growing up in the U.S. are in low-income and minority families. They are more likely to experience digital inequality — too little access to the internet and devices that connect to it. This inequality can worsen existing socioeconomic disparities. While children should be protected from too much screen time, we argue that it is also necessary to consider how unequal technology access can limit low-income children's access to a range of social opportunities. This paper highlights research that is needed on how digital inequality may affect the way children develop over time, and concludes with guidelines to help clinicians support digital connectivity and more equitable social opportunity for the increasingly diverse population of children in the US.

Global Perspectives on Children's Digital Opportunities: An Emerging Research and Policy Agenda

Sonia Livingstone, Dafna Lemish, Sun Sun Lim, Monica Bulger, Patricio Cabello, Magdalena Claro, Tania Cabello-Hutt, Joe Khalil, Kristiina Kumpulainen, Usha S. Nayar, Priya Nayar, Jonghwi Park, Maria Melizza Tan, Jeanne Prinsloo, Bu Wei

International research shows that digital opportunities benefit children worldwide. However, despite high hopes about this potential for enabling children's access to information, education and participation, there is still insufficient evidence to facilitate best practices and policy guidelines, particularly in low and even middle-income countries. This review of existing research suggests that there are sizeable gaps in our accumulated knowledge on digital technologies and children's wellbeing and these should be addressed. The review also highlights the importance of grounding our understanding in specific cultural contexts, taking into account local values, practices, and hopes for the use of technologies. It is particularly important to recognize that digital technologies are often introduced in contexts where there are already considerable existing inequalities as well as diverse local contexts in terms of values and needs. For example, even the goals and expectations from research conducted in different countries vary greatly: while poorer countries are in dire need of research that will help find ways to increase equality in children's access to digital technologies and educational resources, wealthy countries are seeking research that will guide concerns for excessive screen time spent by children, overexposure to commercial content, and the dangers posed by technologies for their privacy and agency. We conclude our review with a recommendation to strike a balance between the need to protect children from harm and the desire to facilitate participation that benefits them. We suggest that a collaboration among all stakeholders — parents, educators, policy-makers, media organizations, medical organizations, international organizations, and children themselves — is necessary in order to maximize positive digital opportunities for children worldwide.

Screen Violence and Youth Behavior

Craig A. Anderson, Brad J. Bushman, Bruce D. Bartholow, Joanne Cantor, Dimitri Christakis, Sarah Coyne, Ed Donnerstein, Jeanne Funk Brockmyer, Douglas Gentile, C. Shawn Green, Rowell Huesmann, Tom Hummer, Barbara Krahé, Victor Strasburger, Wayne Warburton, Barbara J. Wilson, Michele Ybarra

Children today are immersed in entertainment and news media, like fish are immersed in water. Using hand-held devices, children can consume media just about anywhere or anytime they want. Violence is a common theme in the media (e.g., TV programs, movies, videos, video games, music, books, and comic books). Pediatricians, policy makers, and parents often wonder whether violent media are harmful to children. Fortunately, we don't need to rely on unreliable sources to answer this question, such as common sense, gut feelings, intuition, instincts, premonitions, or the biased claims of the media violence industry and its apologists. Science has provided us the answer to this question. Over the past six decades or so, hundreds of research studies have been conducted on this topic. Experimental studies have shown that exposure to media violence *causes* people to behave more aggressively immediately afterward. Field experiments have produced similar effects in natural settings with realistic measures of aggression. The effects can be long lasting too. Numerous longitudinal studies show that exposure to violent media as a child predicts aggressive and violent behavior many years later as an adult. Although there is never complete consensus in any scientific field, the evidence is so convincing that dozens of major scientific and medical organizations have issued statements about the harmful effects of exposure to violent media, such as the American Academy of Pediatrics, American Medical Association, American Psychiatric Association, American Psychological

Association, the U.S. Surgeon General, the Society for the Psychological Study of Social Issues, and the International Society for Research on Aggression. Violent video games may be especially harmful because of their interactive nature, but more research is needed on this issue. Consequently, pediatricians, parents, and policy makers should take steps to protect children from the potentially harmful effects that can occur from violent media exposure.

Defining Cyberbullying

Elizabeth Englander, Edward Donnerstein, Robin Kowalski, Carolyn A. Lin, Katalin Parti

The word cyberbullying is often used, but defining it has proved difficult. Traditional bullying is cruel behavior that is intentional, repetitive, and perpetrated by a more powerful individual over a less powerful target. These three elements are abstract, but still useful because they help researchers study a specific type of social conflict that is more impactful upon the target. In a digital environment, however, studying these three elements is challenging. When is online repetition intentional? Who has more power online? Sometimes researchers are able to study digital behaviors that clearly meet criteria for bullying, but at many other times it's less clear. Imagine, for example, a child who sends a rumor to two or three friends via text message, not considering that the rumor could spread like wildfire through her school's study body and result in months of humiliation and harassment for the target. In such a case, understanding intent, repetition, and power is much more complex than in traditional bullying. Despite this fundamental limitation, researchers have noted that cyberbullying is clearly associated with traditional bullying much, but not all, of the time. It is also clear that cyberbullying impact targets in many ways and can be damaging, emotionally, socially, and academically. To improve our understanding of digital interactions, researchers need to better define and understand the nature of cyberbullying and other forms of digital conflict and cruelty, including online harassment and sexual harassment. We also need to consider how the use of digital communication devices change interactions, and how all this information can be applied to develop effective and useful prevention programs for children and adolescents.

The Effect of Advertising on Children and Adolescents

Matthew A. Lapierre, Frances Fleming- Milici, Esther Rozendaal, Anna R. McAlister, Jessica Castonguay

Children and teens growing up in the United States are surrounded by commercial messages. They see them in television and movies, they surf by them online, they pass them on the street, and they frequently act as marketing messages themselves when they wear branded clothing or accessories. The reason for this message saturation is simple; marketers (and the companies that hire them) make a great deal money targeting young audiences. Children and teens spend billions of their own money on consumer goods and services; they also play a key role in directing the consumer spending of their parents; and marketers who are able to establish brand allegiances at an early age can potentially count on years of brand loyalty later on.

This exposure to commercial messages among children and teens is not entirely benign, however. First, young people's exposure to marketing messages affects important health behaviors and psychological well-being. Second, due to children's developing cognitive and emotional competence, they are not as well equipped as adults are to consider the worth of these messages. Third, marketers using new media platforms are pursuing children and teens more aggressively with serious implications for privacy protection.

With these issues in mind, what can be done to level the playing field for children and teens? For example, are there ways to teach children and teens to counter advertising messages? What strategies can parents and practitioners enact to bolster child defenses? Lastly, are there ways to use what we know about the advertising/marketing industry to encourage protective behaviors in children? This entry by the Advertising and Marketing workgroup examines the potential answers to these questions and explores where research in this area should be heading in the future.

Social Group Stories in the Media and Child Development

Karen E. Dill-Shackleford, Srividya Ramasubramanian, Elizabeth Behm-Morawitz, Erica Scharrer, Melinda C. R. Burgess, Dafna Lemish

As social beings, children and adolescents look to cues in the world around them to develop understandings of themselves and others. These understandings are marked in part by social group categorization, with groups defined by race, ethnicity, gender identity, sexual orientation, religion, and other aspects of human difference. The stories told in the media are a key source of such cues, and our review of the literature shows they have important implications for young people's developing sense of self and of others. The emphasis for women on beauty and on having a particular body size and shape in the media, for example, contributes to body dissatisfaction, low self-esteem, and other threats to health and well-being at increasingly younger ages. For youth of color, our review finds that having a video game avatar of the same race promotes identification whereas encountering stereotypical content associated with a same-race media character can induce stereotype threat, in which youth underperform on measures that correspond to the stereotypes. For primarily White audiences, our review shows that racial and ethnic media stereotypes can contribute to prejudice and racial bias and shape relevant political judgments. In our review, however, we argue that it is important to remember that positive effects can attend more diverse, inclusive, and fluid depictions of social groups in the media. Stories that demonstrate cross-group positive interaction have been shown to lead to diminished prejudice among children, for instance. We conclude our review with recommendations for clinicians, policy makers, and educators that include taking media effects on stereotypes and identity formation seriously, encouraging media literacy efforts, and opening up dialogue with young people about media.

Sexual Media and Childhood Well-Being and Health

Rebecca L. Collins, Victor C. Strasburger, Jane D. Brown, Edward Donnerstein, Amanda Lenhart, L. Monique Ward

Sex in the media is one of the leading sex educators for young people today. Traditional media (e.g., TV, movies, music) influence teens' attitudes and beliefs about sex and gender, as well as sexual behavior and health. More than 20 studies provide supporting evidence for this conclusion. A small number of recent studies suggests that social media (both creating and viewing online content) may have similar effects.

As many as 15% have of youth have sent or received a "sext" (a graphic video, picture, or text of themselves). Sexting may represent a normal variant of teen relationship development but carries risks of personal communications being shared with others and is associated with other risk behaviors such as sexual activity and substance use. Access to pornography and to more extreme pornographic content has expanded as pornography has moved online, creating greater potential for unhealthy changes in exposed youths' sexual expectations and beliefs.

Much more research is needed, particularly studies of social media, mediating (process) and moderating (protective) factors such as developmental stage, impact on minority youth, and identifying positive uses of media to improve knowledge and reduce sexual risk. Studies should also track the type and amount of sexual content in multiple media over time.