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Media and technology use predicts ill-being among children, preteens and teenagers independent of the negative health impacts of exercise and eating habits

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ABSTRACT

The American Academy of Pediatrics recommends no screen time for children under the age of 2 and limited screen time for all children. However, no such guidelines have been proposed for preteens and teenagers. Further, research shows that children, preteens, and teenagers are using massive amounts of media and those with more screen time have been shown to have increased obesity, reduced physical activity, and decreased health. This study examined the impact of technology on four areas of ill-being—psychological issues, behavior problems, attention problems and physical health—among children (aged 4–8), preteens (9–12), and teenagers (13–18) by having 1030 parents complete an online, anonymous survey about their own and their child's behaviors. Measures included daily technology use, daily food consumption, daily exercise, and health. Hypothesis 1, which posited that unhealthy eating would predict impaired ill-being, was partially supported, particularly for children and preteens. Hypothesis 2, which posited that reduced physical activity would predict diminished health levels, was partially supported for preteens and supported for teenagers. Hypothesis 3, that increased daily technology use would predict ill-being after factoring out eating habits and physical activity, was supported. For children and preteens, total media consumption predicted illbeing while for preteens specific technology uses, including video gaming and electronic communication, predicted ill-being. For teenagers, nearly every type of technological activity predicted poor health. Practical implications were discussed in terms of setting limits and boundaries on technology use and encouraging healthy eating and physical activity at home and at school.

1. Introduction

The American Academy of Pediatrics recommends no more than 2 h per day of screen time for preschool children and no screen time for children under the age of 2 with screen time defined as time spent using or watching televisions, computers, phones and other electronic devices (Committee on Public Education, 2001). However, a study at the University of Washington of 8950 children under the age of 5 found that 66% exceeded that limit, spending an average of 4.1 h of daily screen time, 90% of which came at home (Tandon, Zhou, Lozano, & Christakis, 2011). By the time children reach adolescence, screen time soars to 7.5 h per day with more than one-fourth spent media multitasking for a total daily screen time of 10 h and 45 min (Rideout, Foehr, & Roberts, 2010).

Research has also shown that twice as many children and three times as many adolescents are suffering from obesity than just 30 years ago based on increased body mass index scores (National Center for Health Statistics, 2012; Ogden, Carroll, Kit, & Flegal, 2012). In particular, during that same 30-year period, the Center for Disease Control and Prevention (CDC) reported that the percentage of obese 6- to 11-year-olds increased from 7% to 18% while the percentage of obese 12- to 19-year-olds increased similarly from 5% to 18% (CDC, 2013a).

Further, screen time has been linked to increased obesity among children (Anderson & Whitaker, 2010; de Jong et al., 2013; Fitzpatrick, Pagani, & Barnett, 2012; Pagani, Fitzpatrick, Barnett, & Dubow, 2010) and adolescents (Arora et al., 2012; Barnett et al., 2010; Bickham, Walls, Shrier, Blood, & Rich, 2012; Casiano, Kinley, Katz, Chartier, & Sareen, 2012; Do, Shin, Bautista, & Foo, 2013) as well as a reduction in exercise which research shows is predicted by increased media consumption (Anderson, Economos, & Must, 2008; Boone, Gordon-Larsen, Adair, & Popkin,

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2007; Cox et al., 2012; Martin, 2011; Sisson, Broyles, Baker, & Katzmarzyk, 2010; Tandon, Zhou, Sallis, Cain, Frank, & Saelens, 2012). However, it is not simply about time displacement, as a review of studies found that reduced screen time does not necessarily promote increased exercise (Martin, 2011).

Research has also shown that excessive screen use including television, video games, and the Internet predicted a variety of psychological and medical health issues (Martin, 2011). The current study was designed to expand on current work and examine the impact of the use of *specific technologies* among children, preteens, and teenagers on four areas of ill-being: physical problem symptomology, psychological symptom manifestation, attention problems, and home and classroom behaviors. Further, this study will first test the predicted relationships between eating habits and ill-being as well as that between exercise and ill-being, both of which have been documented in the literature. Finally, a path model will be tested that asks the question: "Is there a relationship between media use and ill-being after accounting for the known relationships between exercise and ill-being and eating habits and ill-being as well as demographic characteristics of children, preteens and teenagers and their parents?"

1.1. The impact of screen time on health

While most studies have examined specific media and technology activities, such as television, video gaming, and Internet use, several studies have investigated the impact of total screen time on the health of both children and adolescents. One study of Scottish youth found that total screen time predicted psychological distress independent of physical activity levels (Hamer, Stamatakis, & Mishra, 2009) while another study of Australian adolescents (Martin, 2011) found that excessive screen time predicted increased loneliness, depression, withdrawal, anxiety, attention problems, and aggression. Finally, a third study conducted by Messias, Castro, Saini, Usman, and Peeples (2011) found that excessive amounts of screen time, particularly Internet activity and video gaming, predicted more sadness, suicidal ideation and suicide planning among American teens. In addition, a study of Norwegian teens demonstrated that a combination of more television, video and computer use lead to more back pain and headaches (Torsheim et al., 2010). A recent review paper summarized the impact of screen time by showing that it predicted increased aggression, aggressive feelings, and social isolation among children and adolescents (Ray & Jat, 2010).

1.2. The impact of television on health

Several studies have examined the impact of television viewing at a young age on later health. For example, research has found that: (1) more television viewing at 29 months and 53 months of age predicted more victimization problems and more attention problems at 10 years of age (Parkes, Sweeting, Wight, & Henderson, 2013; Pagani et al., 2010); (2) more TV viewing at 30–33 months predicted more behavior problems at 5 years of age (Mistry, Minkovitz, Srobino, & Borzekowski, 2007), (3) more television viewing at age 5 predicted more psychosocial adjustment problems at age 7 (Parkes et al., 2013), (4) more television at ages 1 and 3 predicted more attention problems at age 7 (Cristakis, Zimmerman, DiGiuseppe, & McCarty, 2004), and (5) more television in middle school predicted more attention problems in late adolescence (Swing, Gentile, Anderson, & Walsh, 2010).

Some studies have qualified these results showing that perhaps the television content—particularly nonviolent and violent entertainment shows compared with educational shows—may be the culprit instead of total television time (Zimmerman & Cristakis, 2007), while other studies (Hamer et al., 2009; Page, Cooper, Griew, & Jago, 2010) showed that it is not the case that television supplants activity leading to poorer health, but rather the two show independent effects. A longitudinal study that tracked New Zealand youth between the ages of 5 and 15 found similar results showing increased television exposure in childhood leading to increased attention problems in the teenage years (Landhuis, Poulton, Welch, & Hancox, 2007). Finally, another study examined the specific impact of television viewing on sleep quality and found that more television viewing in the last 90 min before sleep resulted in worse sleep quality in children (Foley et al., 2013).

Finally, some studies have shown that it is the content of the television programming that best predicts problem behaviors including increased aggression (Strasburger, Jordan, & Donnerstein, 2010), while another study found that the negative impacts of violent media content predicted antisocial behavior, inattention, and emotional distress among Canadian school children in second grade (Fitzpatrick et al., 2012).

1.3. The impact of video gaming and Internet use on health

A wealth of studies has shown consistent results of the effects of video gaming on health. For example, Romer, Bagdasarov, and More (2013) showed that heavy video game usage, regardless of the content, predicted depression among adolescents and young adults, which was corroborated by Lemmens, Valkenburg, and Peter (2011) with Dutch adolescents and by Gentile et al. (2011) with American youth. Other studies have highlighted more negative impacts of video gaming on youth including delinquency and both externalizing and internalizing problems (Holtz & Appel, 2011) among 10- to 14-year-olds; attention problems among adolescents in Singapore (Gentile, Swing, Lim, & Khoo, 2012); increased social phobia, anxiety and lower academic performance among American children and preteens (Gentile et al., 2011); and depression, social withdrawal and anxiety among adolescents and young adults who played "massively multiplayer online role-playing games" (MMORPGs; Scott & Porter-Armstrong, 2013). One study did show that video gaming behavior at age 5 did not predict psychosocial adjustment issues at age 7 (Parkes et al., 2013).

On the other hand, much of the research on the negative impacts of video gaming has focused on the violent aspects of the games themselves. For example, Brown and Bobkowski (2011) found that those adolescents who played more violent video games demonstrated more aggression, which was corroborated by other researchers with Dutch adolescents (Lemmens et al., 2011). However, Gunter and Daly (2012) found that this relationship was not mediated by the propensity for violence among eighth grade American students. In addition, studies of college students have shown that the effects of playing violent games for even a short period of time encouraged them to give a punishing loud noise blast after outscoring another player (Hasan, Bègue, Scharkow, & Bushman, 2013) and that this effect persisted 24 h after completing a short session of violent video gaming (Bushman & Gibson, 2011).

Additional research has shown that the impact of video gaming depends on with whom you are playing, showing that if you are playing with new people the result is increased loneliness while if you are playing with family and/or friends the impact can be an enhanced sense of positive well-being (Cuihua & Williams, 2011). One final result indicated that more video gaming in the last hour before sleep predicted a worse quality of sleep (Foley et al., 2013).

Some studies have looked at general Internet use, without examining specific sites or activities, and found a negative impact on depression among Swiss adolescents (Belanger, Akre, Berchtold, & Michaud, 2011), among American adolescents and young adults (Romer et al., 2013), and among Korean adolescents (Do et al.,