Relationship between Childhood Media Use and Participation and Interest in Extracurricular Activities in Adolescence

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BRIEF. This study examines how media exposure during childhood might influence the activities adolescents partake in and enjoy.

ABSTRACT. As technology advances, electronic media has become increasingly accessible. While the effects of electronic media on health have been examined, not much is known about how early electronic media use influences adolescents' day-to-day lives. This study uses survey data to determine how childhood media use relates to adolescents' interest in and time spent on various extracurricular activities. Statistically significant differences were found between level of electronic media use in childhood and time spent on quality interactions ($p = 0.015$), and consuming media ($p = 0.016$) in adolescence. However, level of electronic media use in childhood did not influence adolescents' interest in activities or media. These results suggest that increased electronic media exposure in childhood has some impact on how adolescents spend their time.

INTRODUCTION.

The effects of electronic media usage on children's development and health have long been debated, but researchers have generally noted the negative consequences of excessive media use. For instance, one prospective longitudinal study that analyzed the academic performance of elementary schoolers found that two or more hours of computer or television use per day resulted in losing 4 months of learning at follow-up [1]. However, positive effects of media use have also been considered. For example, when comparing learning using traditional computer-assisted instruction to a computer-based video game, students who used the video game showed greater improvements in recall processes and problem-solving skills relative to those who used the traditional instruction method [2].

Excessive media usage has been linked to poor psychophysiological resilience, including problems with social coping and attachment and physical health problems such as obesity, high blood pressure, and headaches [3]. Furthermore, studies have shown that high media consumption correlates negatively with participation in sports activities and motor skills [4]. Additionally, high media consumption is correlated with delaying the circadian phase, which affects sleep and development [5]. Therefore, the lack of a sound psychophysiological resilience could hinder students' motivation and/or ability to participate in a variety of activities.

Meanwhile, other researchers have investigated social displacement, the theory that spending more time on the internet leads to spending less time having face-to-face interactions with close friends and family. This theory is supported by four types of indirect evidence: a positive association between social media use and loneliness, a stronger positive association between face-to-face relationships and positive psychosocial outcomes than with online-only relationships, a positive association between engagement and less close people, and a negative association between social media use and interactions with close friends and family [6]. However, other studies have found little evidence to support the idea that social media use displaces direct social contact or face-to-face interactions [7]. Although many extracurricular activities inherently involve face-to-face interactions, researchers have questioned if media usage could displace interest and/or time spent on extracurriculars, especially when close friends or family are not involved.

Current research regarding the relationship between media use and involvement in extracurricular activities is slim. Instead, much of the research on extracurriculars has affirmed their positive impact on students' lives. Recent studies have found that extracurriculars provide excellent opportunities for students to develop communication skills, emotional intelligence, relationship skills, and organization and planning skills that promote future success [8]. Participation in sports has been associated with lower rates of dropping out of school, and participation in non-sport activities has been associated with attaining higher levels of education. Mixed participation in both types of activities were related to higher levels of education and social capital [9]. If media usage is linked to lower levels of extracurricular participation as it is with academic performance and health, then adolescents may be less likely to experience the positive effects of extracurricular participation, which could have a significant negative impact on their development.

The goal of this study is to examine the relationship between electronic media use during childhood and interest and time spent on extracurricular activities in adolescence. Two major hypotheses were tested: (1) higher levels of childhood media use will be associated with more time displaced from extracurricular activities in adolescence, and (2) higher levels of childhood media use will relate to less interest in extracurricular activities in adolescence. We also considered that extensive media use in childhood could lead to a similar pattern of usage in adolescence, which could explain less interest in and time spent on extracurricular activities in adolescence. This led to our secondary hypotheses: (3) higher levels of childhood media use will be associated with more time spent consuming media during adolescence, and (4) higher levels of childhood media use will relate to higher levels of interest in media during adolescence.

MATERIALS AND METHODS.

Participants. Seventy-three high school students participated in this study. Participant demographics are listed in Table 1. Participants were recruited using various social media platforms, such as Discord, Messages, and Instagram, and in-person at a local high school. Before completing the survey, all participants were assured of anonymity and confidentiality and provided consent by reading and signing a waiver.

Materials and Procedure. All participants completed a survey that was designed to address each of the independent and dependent variables that corresponded to our hypotheses. The first section of the survey

Table 1. Demographic distribution of participants.

Age, years (M±SD)	15.4 ± 1.1
Gender	Male (52.7%) Female (41.9%) Other (5.4%)
Race/Ethnicity	Asian (75.3%) White (12.3%) Black (2.7%) Latinx (1.4%) Other (8.2%)

included questions regarding participant demographics, such as age, ethnicity, and gender. The second section of the survey asked participants to report the types of electronic media they were exposed to in childhood. Childhood was defined as the period of time before middle school, or before age 13. Electronic media options included mobile games, console games, PC games, TV, YouTube, digital communication, and electronic learning. For each type of electronic media that participants consumed in childhood, they were asked to rate their level of usage as compared to their peers (i.e., below average, average, or above average). The third section of the survey asked participants to report their level of participation and interest in several activities in adolescence (defined as the high school years, or ages 14-18). Activities were separated into five categories: traditional extracurricular activities (e.g., sports, lessons, clubs), outside-of-school responsibilities (e.g., volunteer work, part-time jobs), hobbies (e.g., reading, baking, outdoor activities), quality time (i.e., spending intentional time with friends, family, and/or pets), and electronic media (i.e., gaming, TV, YouTube, digital communication, and electronic learning). Participants were asked to report the number of hours per week they spent on each activity and were asked to rate their interest in each activity on a 5-point Likert scale (1 = not interested, 5 = very interested).

Statistical Analysis Approach. Statistical analyses were conducted in RStudio version 2022.07.2+576. To test for group differences across each of the four hypotheses, we ran analyses of variance (ANOVA). The independent variable for all analyses was level of electronic media use in childhood. Level of electronic media use in childhood was a categorical variable that was measured using a composite grouping variable that accounted for a participant's reported level of usage on each of the 7 forms of electronic media assessed by the survey. Participants who reported above average usage on 4 or more forms of media were labeled as having Above Average levels of childhood media use, those who reported below average usage on 4 or more forms of media were labeled as having Below Average levels of childhood media use, and all other participants were labeled as having Average levels of childhood media use. The dependent variables were total time, in hours per week, spent on non-media activities in adolescence (Hypothesis 1), average level of interest in one's non-media activities in adolescence (Hypothesis 2), total time, in hours per week, spent consuming electronic media in adolescence (Hypothesis 3), and average level of interest in electronic media in adolescence (Hypothesis 4). To follow up on statistically significant findings from ANOVA analyses, we performed post-hoc tests using the Tukey HSD procedure.

RESULTS.

Participants' composite media exposure distribution is as follows: 16 were Below Average, 45 were Average, and 12 were Above Average.

To test Hypothesis 1, we examined the relationships between level of electronic media use in childhood and time, in hours per week, spent partaking in different activities (i.e., traditional extracurricular activities, outside-of-school responsibilities, hobbies, and quality time) in adolescence. There was a statistically significant difference in time spent on quality interactions between groups (F (2,69) = 4.47, p = 0.015). Specifically, those who reported Above Average levels of childhood media use spent more time on quality interactions in adolescence compared to those who reported Average levels of childhood media use (Above Average M = 20.67, SD = 9.76; Average M = 12.85, SD = 8.5; p = 0.014). There were no differences between those who reported Below Average levels and Average levels of childhood media use (Below Average: M = 16.28, SD = 6.22; p = 0.338). There were also no differences between those who reported Below Average levels and Above Average levels of childhood media use (p = 0.354). There were no statistically significant relationships found between groups with respect to time spent on traditional extracurricular activities, outside-of-school responsibilities, and hobbies in adolescence (all Fs < 1.83, all ps > 0.169). Figure 1 depicts the mean number of hours per week spent on each type of activity.

To test Hypothesis 2, we examined the relationships between level of electronic childhood media use and level of interest in different activities (i.e., traditional extracurricular activities, outside-of-home responsibilities, hobbies, and quality time) in adolescence. There were no statistically significant differences found between groups for any of the categories of activities (all Fs < 1.25, all ps > 0.294). Figure 2 depicts the mean level of interest in each type of activity.

To test Hypothesis 3, we investigated the relationship between level of childhood media use and time, in hours per week, spent consuming electronic media in adolescence. There was a statistically significant difference in time spent consuming electronic media in adolescence between groups (F (2,70) = 4.43, p = 0.016). Specifically, those who reported Above Average levels of childhood media use spent more time consuming media in adolescence compared to those who reported Average levels of childhood media use (Above Average M = 46.17, SD = 28.29; Average M= 28.81, SD = 14.25; p = 0.011). There were no differences in time spent consuming electronic media in adolescence between those who reported Below Average levels and Average levels of childhood media use (Below Average: M = 32.13, SD = 17.93; p = 0.802). There were also no differences between those who reported Below Average levels and Above Average levels of childhood media use (p = 0.108).

To test Hypothesis 4, we investigated the relationship between level of electronic media use during childhood and average level of interest in electronic media in adolescence. There was no statistically significant difference found between groups (F (2,70) = 1.65, p = 0.200).

DISCUSSION.

The aims of this study were to investigate the relationships between electronic media use in childhood and interest and time spent on extracurricular activities in adolescence. Results suggest that those who had the greatest exposure to electronic media in childhood tend to spend more time consuming electronic media in adolescence. Surprisingly, those who reported Above Average levels of childhood media use reported spending more time on quality interactions with others in adolescence. However, there were no differences in amount of time spent partaking in other activities that could be explained by level of childhood media use. Additionally, no relationships between level of childhood media use and interest in electronic media or other activities in adolescence were found.

The finding that those who reported Above Average childhood media use spent more time consuming media in adolescence than those who reported lower levels of childhood media use was consistent with our hypothesis. However, the Below Average and Average childhood media use groups reported similar levels of media consumption in adolescence. This could be explained by the fact that media continues to become increasingly accessible, and those who did not get to spend as much time on media in childhood now have more opportunities to do so. Additionally, adolescents generally have more freedom in choosing how to spend their time than children do.

Contrary to our hypothesis, greater media use during childhood did not lead to social displacement in adolescence. This is consistent with the findings of Hall et al. (2017) and Hall and Liu (2022), which show that social media use does not necessarily displace face-to-face contact. Indeed, forms of media such as video games or digital communication could allow people to connect online and then meet in person. However, the finding that those who reported Above Average childhood media use spent more time on quality interactions in adoles-

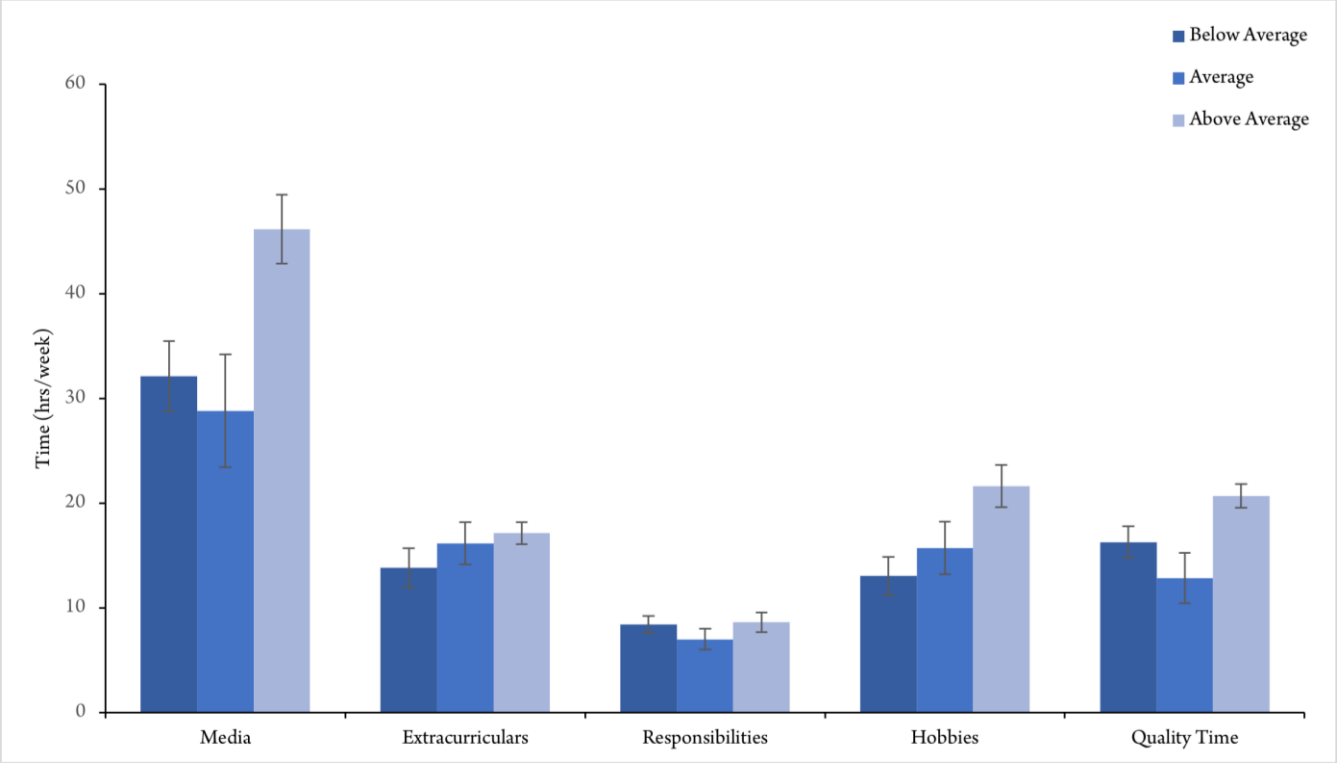

Figure 1. Time Spent on Media and Other Activities in Adolescence. This bar graph shows the mean number of hours per week spent on media and non-media activities in adolescence, separated by childhood media use subgroups. Error bars represent the standard error of the mean.

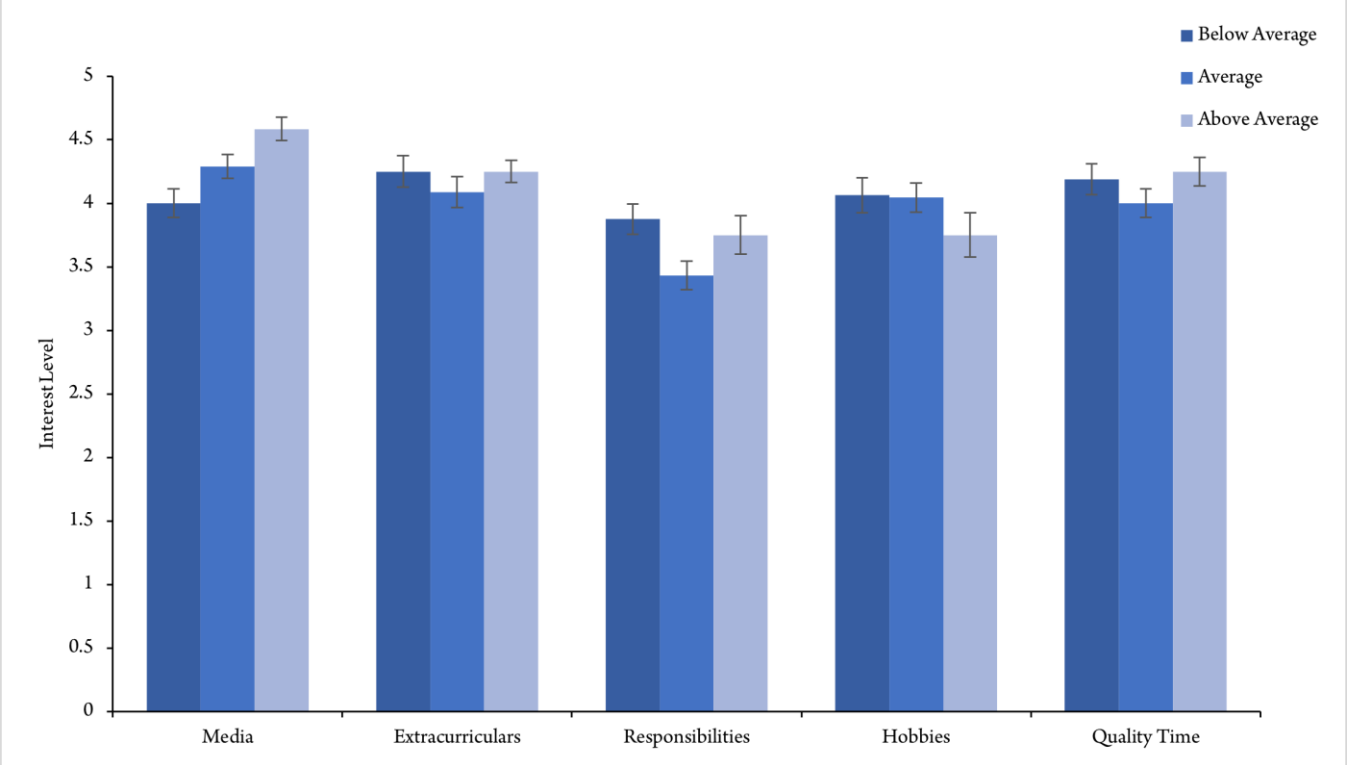

Figure 2. Interest in Media and Other Activities in Adolescence. This bar graph shows the mean level of interest in media and non-media activities in adolescence, separated by childhood media use subgroups. Error bars represent the standard error of the mean.

cence was unexpected. One explanation for this finding is that individuals may spend time consuming media with their family and friends and count it as quality time. For example, those who consumed more media during childhood might be more likely to spend their time playing video games with their family, instead of choosing to read, write, or participate in other solo activities.

One limitation to our study design is that participant bias may have influenced participants' responses, such that participants responded in a way that they deemed to be socially acceptable (e.g., underreporting number of hours spent consuming media). However, we took this into account by phrasing the survey questions and answer choices in a neutral way to minimize the likelihood that participants would feel pressured to choose a specific answer. Additionally, we anticipated that participants would have difficulty recalling the number of hours per week they spent consuming media during childhood, so we instead asked participants to compare their level of media usage to that of their peers and created groupings to reflect Average, Above Average, and Below Average levels of childhood media usage. One downside to this approach is that it does not provide clear quantitative anchors; "Above Average" could mean 2 hours per week for one person, and 7 hours per week for another.

Additionally, this study only surveyed one generation of current high school students, who have grown up in an era in which phones, tablets, computers, and televisions have always been readily available. They have also completed a year of online learning during the COVID-19 pandemic and have spent more time on electronic learning than they may have done otherwise. Because of the pandemic, many forms of communication and activities were also moved online, resulting in more time spent on electronic media. Therefore, the results cannot be generalized to any other generation, as different age groups would have vastly different experiences.

Another limitation is the relatively homogenous sample, which limits the generalizability of these findings. Although the sample demographics reflect the demographics of the local high school where the survey was primarily distributed, future research on this topic should seek to include a more diverse sample.

Nonetheless, this survey provides a quicker and cheaper alternative to conducting a years-long longitudinal study of the influences of childhood media exposure on activities and interests in adolescence. It also allows us to collect detailed information on each participant's interest in a wide range of activities, which cannot be just observed.

In conclusion, these findings do not support the hypotheses that people who consume high levels of electronic media in childhood are less involved in and less interested in non-media activities in adolescence. However, our findings partially support the idea that greater electronic media use in childhood may lead to greater media consumption in adolescence. Future studies should focus on which types of media influence children the most, and how media may promote spending quality time with loved ones.

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