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Sociodemographic Correlates of Contemporary Screen Time Use among 9-10-Year-Old Children

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Abstract

Objective: To determine sociodemographic correlates of contemporary screen time use among a diverse population-based sample of 9-10-year-old children.

Study design: In 2021, we analyzed cross-sectional baseline (2016-2018) data from the Adolescent Brain Cognitive Development (ABCD) Study (N=10,755). Multiple linear regression analyses were conducted to estimate associations between sociodemographic factors (sex, race/ethnicity, country of birth, household income, parental education) and six contemporary forms of screen time (television, videos [e.g., YouTube], video games, social networking, texting, and video chat).

Results: On average, children reported 3.99 hours of screen time per day across six modalities, with the most time spent watching/streaming television shows/movies (1.31 hours), playing video games (1.06 hours), and watching/streaming videos (1.05 hours). On average, Black children reported 1.58 more hours of screen time per day and Asian children reported 0.35 less hours of screen time per day compared to White children (mean 3.46 hours per day), and these trends persisted across most modalities. Boys reported higher overall screen time (0.75 hours more) than

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girls, which was primarily attributed to video games and videos. Girls reported more time texting, social networking, and video chatting than boys. Higher income was associated with lower screen time usage across all modalities except video chat. However, in high-income households, Latinx children reported 0.65 more hours of screen time per day than White children.

Conclusions: Given the sociodemographic differences in child screen use, guideline implementation strategies can focus on key populations, encourage targeted counseling by pediatricians, and adapt Family Media Use Plans for diverse backgrounds.

Keywords

Screen time; television; social media; smart phone; pediatrics; adolescents

The advancement, accessibility, and greater utility and entertainment value of technology has led to the rapid increase in use of screens by children and adolescents as a way to facilitate their interactions with the world [1–3]. Screen usage in young children has nearly tripled between 1997 and 2014 [4]. In addition, screen time utilization has increased by 1.3 hours over the span of five years among adolescents [5]. In 2019, children 8–12 years of age reported using screens for about 5 hours each day, not including time spent on school work [6]. Research exploring the effects of screen time on health in children and adolescents has grown in the last 10 years [7]. It has been shown that technology overuse predicts health and behavioral problems in children and early adolescents [8–11]. Furthermore, recent studies have specifically linked excessive screen time with adverse effects on children’s health, including depression, anxiety, inattention, poor sleep, and physical inactivity [2,7]. However, it is apparent that effects of screen time are nuanced, depending on factors such as level of engagement and interaction [12,13].

Several organizations have put forward recommendations for limiting screen time among youth and adolescence. The 5-2-1-0 community-based obesity prevention intervention, Australia’s 24-hour movement guidelines, and Canada’s 24-hour movement guidelines recommend no more than 2 hours of screen time per day for youth [14–16]. The American Academy of Pediatrics (AAP) formerly recommended less than 2 hours of screen time per day among children, and now advocates for a Family Media Use Plan rather than a one-size-fits-all approach [17].

Identifying the prevalence of screen usage and sociodemographic factors associated with children’s screen time are key to preventing adverse downstream effects like decreased physical activity, risk of overweight or obesity, and persistent psychological distress [18], particularly among higher risk groups. Minority children and children from lower socio-economic backgrounds tend to have higher levels of screen time when compared to their White peers [19,20]. Structural and systematic discrimination of minority populations in the U.S. can manifest in the built environment as inadequate access to safe parks and recreational areas, disinvestment in afterschool education programs promoting arts, music, or sports, food insecurity, and increased responsibilities on youth as family caretakers. Together, these factors may lead to the elevated screen time burden experienced by youth from these communities [21–25]. Children from lower socio-economic backgrounds are more likely to have screens (e.g. television, video games) in their bedrooms and

decreased accessibility to opportunities for physical activity or sport than those from higher socioeconomic backgrounds, and these factors jointly increase their daily screen time [26,27]. Black and Hispanic adolescents report the highest levels of screen time [5]. In addition, Black, Asian, and Hispanic children and adolescents are more likely to exceed the two hours per day screen time recommendation than White children and adolescents [28]. These factors may be further nuanced by a child's immigration status, with increased acculturation to the U.S. being associated with increased levels of screen time [29].

Prior evidence has suggested that screen time use increases the most among 11-14 year-olds [30]; however, there are few large-scale studies focusing on younger children [5]. Moreover, the screen time modalities available to youth have diversified, yet the majority of research is centered on television viewing. Additionally, prior work has not studied sociodemographic correlates of contemporary screen time modalities using a large national sample and an intersectional lens (e.g., interactions between race/ethnicity and socio-economic status).

Given these gaps, the objective of our study is to explore the usage of screen time in a demographically diverse and population-based sample of U.S. children aged 9-10-years-old, considering six different modalities: video gaming, social networking, texting, video chatting, video streaming, and television/movie viewing. We hypothesized that differences in screen time patterns would exist by sex, race/ethnicity, and socio-economic status.

2. Methods

Cross-sectional baseline data are analyzed from the Adolescent Brain Cognitive Development (ABCD) Study (3.0 release; 2016-2018, ages 9-10 years) to address the study objectives. The ABCD Study is a longitudinal study of brain development and health in 11,875 children recruited from 21 sites around the U.S. Further descriptions of the study sample, recruitment, procedures, and measures have been described previously [31]. Data were taken from the baseline (Year 0) ABCD assessment. Participants with missing data for sociodemographic or screen time variables were excluded (Table 1; online only), leaving a total of 10,755 in the cohort. Participants with missing data were more likely to be racial/ethnic minorities, born outside the U.S., and have parents with lower education and lower incomes. Centralized institutional review board (IRB) approval was obtained from the University of California, San Diego. Study sites obtained approval from their local IRBs. Caregivers provided written informed consent and each child provided written assent.

Measures

Dependent Variable: Screen Time—Self-reported screen time was determined from the ABCD Youth Screen Time Survey, based on a previously validated measure [32–35]. Participants reported typical hours per day spent on six different screen modalities (viewing/streaming television shows or movies, watching/streaming videos [e.g., YouTube], playing video games, texting, video chatting [e.g., Skype, Facetime], and social networking [e.g., Facebook, Instagram, Twitter]) separately for weekdays and weekend days [32–35]. Similar to a previous study looking at screen time exposure in the ABCD study, we performed a weighted average calculation of the participants' typical weekday and weekend screen time consumption to obtain a typical week measure ((weekday average × 5) + (weekend average

$\times 2)/7$ [9]. This single measure allowed us to incorporate an estimated average daily screen use over a week in order to allow for a single screen time outcome. After obtaining this total for each screen time modality used by participants, we reported the weighted total screen time average as a continuous variable.

Independent Variables: Sex (male or female), race/ethnicity (White, Latinx/Hispanic, Black, Asian, Native American, other), and country of birth (U.S. or outside U.S.) were based on parent's report.

Household income and highest parent education were based on parents' report. For household income, parents were asked, "What is your TOTAL COMBINED FAMILY INCOME for the past 12 months? This should include income (before taxes and deductions) from all sources, wages, rent from properties, social security, disability and/or veteran's benefits, unemployment benefits, workman's compensation, help from relative (include child payments and alimony), and so on." Household income was categorized into the following categories: less than \$75,000 and \$75,000 and greater, as this approximated the median household income in the U.S. [36]. For education, parents were asked, "What is the highest grade or level of school you have completed or the highest degree you have received?" and "What is the highest grade or level of school your partner completed or highest degree they received?" Highest parent education was defined as the highest grade or level of school received by the parent or their partner and categorized into high school or less versus college education or more.

Statistical Analyses

Data analysis was performed in 2021 using Stata 15.1 (StataCorp). Multiple linear regression analyses were conducted to estimate associations between sociodemographic factors (sex, race/ethnicity, country of birth, household income, parental education, BMI) and six contemporary forms of screen time (television, videos [e.g., YouTube], video games, social networking, texting, and video chat), adjusting for site. We tested for effect modification by income in the association between race/ethnicity and screen time as well as sex and screen time, and presented income-stratified results given evidence of significant effect modification ($p < 0.05$). Some children within the sample were twins or siblings. Sensitivity analyses were conducted including only one sibling per family and findings did not differ; therefore, we present results from the full sample. Propensity weights were applied to match key sociodemographic variables in the ABCD Study to the American Community Survey from the U.S. Census [37].

Results

Table 2 describes sociodemographic characteristics of the 10,755 participants included. The analytic sample was approximately matched by sex (48.8% female) and racially and ethnically diverse (47.8% racial/ethnic minority). On average, at baseline, youth reported 3.99 hours of screen time per day, with the most time spent watching/streaming television shows/movies (1.31 hours), playing video games (1.06 hours), and watching/streaming videos (e.g. YouTube, 1.05 hours).

Table 3 shows linear regression analyses examining sociodemographic associations with contemporary screen time usage. On average, Black children reported 1.58 (95% CI 1.35-1.79) more hours of screen time per day and Asian children reported 0.35 (95% CI 0.09-0.62) less hours of screen time per day compared to White children, and these trends persisted across most screen time modalities. Latinx/a children reported 0.09 (95% CI 0.01-0.18) more hours of videos per day than White children. Boys reported higher overall screen time (0.75, 95% CI 0.63-0.89 hours) than girls, which was driven by more time spent on video games and videos. Girls reported more time texting, social networking, and video chat than boys. Lower income was associated with higher screen time usage across modalities except video chat. Lower parental education was associated with higher total screen time, videos, and texting.

Table 4 shows linear regression analyses examining sociodemographic associations with contemporary screen time usage stratified by income given evidence of significant effect modification by income ($p < 0.05$). There were some notable differences by race/ethnicity and income level. In high-income households, Latinx children reported 0.64 more hours (95% CI, 0.36-0.91) of screen time per day compared to White children, and these trends were true of television, videos, texting, and video chat. However, in low-income households, there were no differences in total hours of screen time between Latinx and White children. Differences in the association of parent education and screen time were also observed by income. In high-income households, having a parent with a high school education or less was associated with 1.05 more hours (95% CI 0.55-1.56) of screen time per day than having a college-educated parent. In low-income households, there were no significant differences in screen time by parents' education level. While overall associations with sex and total screen time remained similar by income level, there was evidence of effect modification by income for video games and social networking (both p for interaction < 0.05). Among low-income households, boys had higher video game usage and lower social networking usage than girls, compared to those in high-income households.

Discussion

In this population-based, demographically diverse sample of 9-10-year-old children in the U.S., we found several notable sociodemographic factors associated with contemporary screen time usage. We found that Black children had higher total screen time usage than White children, while Asian children had lower total screen time usage. Lower income was associated with higher usage of all forms of contemporary screen time except for video chat. We found that income modified screen time differences by race/ethnicity. In low-income households, differences by race/ethnicity were attenuated. In high-income households, Latinx children had higher screen time usage than White children. Lower parental education was associated with higher total screen time usage. Although boys overall had higher total screen time usage than girls, girls had higher daily usage of social networking, texting, and video chatting.

We found that Black children reported higher levels of all contemporary screen time types. This finding is in accord with prior research showing higher levels of TV viewing and video games in Black children [38–40], but broadens these findings to texting, video chat,

social networking, and internet videos. Racial differences in screen time usage may be related to neighborhood environments, including fewer opportunities for outdoor physical activity in predominantly Black neighborhoods [41]. Prior studies have shown that lower perceptions of neighborhood safety are associated with lower physical activity and more screen time [42,43]. In addition, children may turn to technology's vast entertainment and social networking features as an accessible way to cope with everyday stressors [44].

We found that Asian children reported lower levels of all types of screen time. Prior studies have had mixed findings regarding Asian children's screen usage [28,45]. It is possible that lower screen time usage reflects lower representation and content marketing for Asian American children and thus less relatable content for this population [46].

Overall, children in lower-income families had higher engagement in nearly all forms of screen time except for video chatting. In families from low socioeconomic backgrounds, higher screen use is associated with reduced parent-child interactions, such as screen-free conversations or field trips [47]. Heavy parent screen use predicts child screen use and may lead to distracted parenting, or a phenomenon referred to as "technology interference" or "technoference" [48]. Lower parental education was associated with higher total screen time usage, videos, and texting, expanding on prior findings for television and computer screen time usage [27]. These findings may reflect the influence of the neighborhood environment in low-income neighborhoods, with prior studies showing that neighborhood-level factors such as poorer perceived aesthetics [49], higher social neighborhood disorder [50], and inadequate access to outdoor activities [51] are associated with higher adolescent screen time. In low-income households, differences by race/ethnicity were attenuated, indicating that the association of socio-economic status on screen time may cut across race/ethnicity. Low socio-economic status may be a prominent driver of higher screen time regardless of race/ethnicity. Among high-income households, we found more pronounced racial and ethnic screen time differences especially for Black and Latinx children, similar to prior studies examining the relationship between screen time and income in Black youth [45]. Overall, we found that Latinx children reported higher usage of videos (e.g., YouTube), but not other contemporary forms of screen time, than White children. Among high-income households, Latinx children had higher total screen time, television, videos, video chat, and texting. Prior literature on Latinx populations has mostly shown higher levels of TV viewing compared to non-Latinx populations, with Latinx families reporting that they use TV time as a way to help keep their child engaged, help them fall asleep, and allow for other televisions in the home to be more widely available [52]. Among first generation Spanish speaking youth, parents often turn to American television to reinforce English language development with their youth [52].

Boys on average report higher total daily screen time, which is driven by more time playing video games and watching/streaming videos, similar to findings of most other studies [38,53]. However, girls spend more time than boys on social networking, texting, and video chat. While the amount of time that 9-10-year-old children spent on social networking, texting, and video chat was much less overall than on television viewing, as these children enter adolescence and young adulthood, time spent on these contemporary screen modalities may increase. It is also noteworthy that sex differences in video games

and social networking were greater in low-income households compared to high-income households.

Several limitations and strengths of the study should be noted. Given the cross-sectional analysis, we were unable to make causal claims. Although we adjusted for several potential confounders, there is the possibility of residual confounding. Measures were based on self-report, which could be subject to recall and reporting bias. Screen time categories of “TV shows and movies” and “videos (such as YouTube)” may not be mutually exclusive, although YouTube videos may include more home-made videos and short clips [54]. It is important to note that the effect sizes of some of the less-used screen time modalities were small. There was a possibility of selection bias given that participants with missing data were more likely to be racial/ethnic minorities, born outside the U.S., and from lower socio-economic backgrounds. Strengths of the study include a large, diverse, population-based sample. Further, the measures captured diverse and contemporary screen time modalities.

Our findings have important clinical, policy, and public health implications, particularly to inform the implementation and adaptation of existing screen time guidelines. This research can further inform more targeted guidance for specific populations. For instance, given limited time during primary care well visits, counseling for both caregivers and children from pediatricians could include more targeted discussion about the potential risks and benefits of video games for boys and social networking for girls. Targeted screening and counseling could align with a precision medicine or precision public health-based approach. Given our finding that children from lower socio-economic backgrounds are more likely to have higher screen use, the AAP family media use plan could be adapted for families with fewer resources. For instance, designating the child’s bedroom as a screen-free zone or recharging devices overnight outside the child’s bedroom may not be possible for families living in a single room or bedroom. Other alternatives could be turning off or placing devices in “do not disturb” mode overnight if multiple rooms are not available, as well as informing and educating parents on technology features that allow for monitoring and limiting their child’s screen usage (e.g., app limits). Furthermore, community and school-level implementation efforts to engage families of color may involve building community coalitions, mobilizing social networks, and tailoring culturally specific messages [55]. For example, schools and communities may choose to invest resources in developing safer and more accessible recreational centers for children and their families to encourage alternative modes of engagement. They may also work with community centers and organizations to provide educational guidance for parents who wish to learn more about effective ways to tailor their own Family Media Use Plan.

Policies and guidelines for screen time use should consider the unique differences found in this study to inform individualized counseling and implementation efforts. Increased knowledge on current differences in screen time among children 9-10-year-olds can also inform and strengthen future child-facing interventions across various technological platforms while tailoring approaches for the needs of children in this age group. Understanding differences in screen time usage is important especially given unprecedented levels of screen time during the COVID-19 pandemic [56]. Future research can examine

what factors are associated with contemporary screen time usage in older adolescents and young adults.

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Abbreviations

AAP	American Academy of Pediatrics
ABCD	Adolescent Brain Cognitive Development
BMI	body mass index
TV	television

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Table 1.

Comparison of sociodemographic characteristics of adolescents in the Adolescent Brain Cognitive Development (ABCD) Study who were included versus excluded, May 2020 (n=11,875)

	Included n=10,755	Excluded n=1,120	
	%		p ^a
Sex			0.251
Female	48.0%	46.2%	
Male	52.0%	53.8%	
Race/ethnicity			<0.001
White	54.5%	29.5%	
Latino / Hispanic	16.1%	27.6%	
Black	19.1%	31.7%	
Asian	6.0%	5.7%	
Native American	3.4%	3.8%	
Other	0.9%	1.7%	
Country of birth			<0.001
US	97.2%	95.2%	
Outside of US	2.8%	4.8%	
Highest parent education			<0.001
College education or more	95.2%	62.3%	
High school education or less	15.1%	37.7%	
Household income			<0.001
\$75,000 and greater	56.7%	35.3%	
Less than \$75,000	43.3%	64.7%	

Participants were excluded due to nonresponse or missing screen time data.

^aPearson's chi square test

Table 2.

Sociodemographic and screen time characteristics of Adolescent Brain Cognitive Development (ABCD) Study participants (N=10,755)

Sociodemographic characteristics (baseline)	Mean (SD) / %
Age (years)	9.9 (0.6)
Sex (%)	
Female	48.8%
Male	51.2%
Race/ethnicity (%)	
White	52.2%
Latino / Hispanic	20.0%
Black	17.3%
Asian	5.5%
Native American	3.2%
Other	1.9%
Country of birth (%)	
USA	96.2%
Other country	3.8%
Household income (%)	
Less than \$25,000	18.7%
\$25,000 through \$49,999	20.4%
\$50,000 through \$74,999	17.5%
\$75,000 through \$99,999	13.4%
\$100,000 through \$199,999	22.6%
\$200,000 and greater	7.4%
Parent with college education or more (%)	79.7%
Screen time variables (baseline, hours per day)	
Total screen time	3.99 (3.16)
Social media (social networking, video chat, texting)	0.58 (1.21)
Television shows/movies	1.31 (1.31)
Videos (e.g. YouTube)	1.05 (1.18)
Video games	1.06 (1.13)
Texting	0.24 (0.56)
Video chat	0.21 (0.52)
Social networking	0.13 (0.45)

ABCD propensity weights were applied to yield nationally representative estimates based on the American Community Survey from the US Census. SD = standard deviation

Table 3. Sociodemographic associations with screen time in the Adolescent Brain Cognitive Development (ABCD) Study (N=10,755)

	Total screen time		Television		Videos (YouTube)		Video games		Social networking		Texting		Video chat	
	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p
Sociodemographic characteristics														
Sex														
Female	reference		reference		reference		reference		reference		reference		reference	
Male	0.75 (0.63 - 0.89)	<0.001	0.04 (-0.01 - 0.08)	0.119	0.19 (0.14 - 0.24)	<0.001	0.68 (0.64 - 0.73)	<0.001	-0.05 (-0.07 - -0.03)	<0.001	-0.07 (-0.10 - -0.05)	<0.001	-0.04 (-0.06 - -0.02)	<0.001
Race/ethnicity														
White	reference		reference		reference		reference		reference		reference		reference	
Latinx / Hispanic	0.22 (-0.02-0.45)	0.080	0.06 (-0.02-0.14)	0.154	0.09 (0.01-0.18)	0.035	0.01 (-0.07-0.10)	0.718	-0.01 (-0.04 - 0.03)	0.712	0.03 (-0.02 - 0.07)	0.198	0.03 (-0.01-0.07)	0.155
Black	1.58 (1.35 - 1.79)	<0.001	0.36 (0.28-0.43)	<0.001	0.39 (0.31-0.47)	<0.001	0.28 (0.20-0.35)	<0.001	0.13 (0.09-0.17)	<0.001	0.22 (0.18-0.27)	<0.001	0.17 (0.13-0.22)	<0.001
Asian	-0.35 (-0.62 - -0.09)	0.008	-0.15 (-0.26 - -0.05)	<0.005	-0.05 (-0.16-0.06)	0.357	-0.10 (-0.19-0.00)	0.051	-0.03 (-0.06 - -0.01)	<0.005	-0.03 (-0.06 - 0.01)	0.101	0.00 (-0.04-0.04)	0.999
Native American	0.37 (0.00-0.74)	0.052	0.01 (-0.14-0.15)	0.944	0.15 (-0.02-0.31)	0.093	0.13 (-0.03-0.29)	0.112	0.02 (-0.05-0.08)	0.599	0.03 (-0.03-0.10)	0.311	0.04 (-0.02-0.09)	0.194
Other	0.24 (-0.70-1.19)	0.615	-0.01 (-0.28-0.26)	0.952	-0.08 (-0.34-0.17)	0.525	-0.02 (-0.31-0.27)	0.884	0.14 (-0.05-0.33)	0.153	0.13 (-0.03-0.29)	0.123	0.08 (-0.07-0.22)	0.288
Country of birth														
USA	reference		reference		reference		reference		reference		reference		reference	
Other country	-0.07 (-0.45-0.31)	0.724	-0.10 (-0.23-0.31)	0.135	0.03 (-0.11-0.17)	0.653	-0.67 (-0.20-0.07)	0.331	0.04 (-0.01-0.10)	0.174	0.04 (-0.04-0.12)	0.361	0.02 (-0.06-0.09)	0.623
Household income														
\$75,000 and greater	reference		reference		reference		reference		reference		reference		reference	
Less than \$75,000	0.91 (0.77-1.05)	<0.001	0.24 (0.19-0.30)	<0.001	0.31 (0.25-0.37)	<0.001	0.25 (0.19-0.30)	<0.001	0.06 (0.04-0.08)	<0.001	0.04 (0.01-0.06)	0.004	0.02 (-0.01-0.03)	0.220
Parent's highest education														
College education or more	reference		reference		reference		reference		reference		reference		reference	

Sociodemographic characteristics	Total screen time		Television		Videos (YouTube)		Video games		Social networking		Texting		Video chat	
	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p
High school education or less	0.28 (0.06-0.49)	0.012	-0.04 (-0.11-0.03)	0.311	0.13 (0.04-0.21)	0.003	0.09 (0.01-0.17)	0.019	0.03 (-0.01-0.06)	0.107	0.06 (0.02-0.10)	0.007	0.03 (-0.01-0.07)	0.139

Bold indicates p<0.05. Propensity weights were applied to match key sociodemographic variables in the ABCD Study to the American Community Survey from the US Census.

All models include sex, race/ethnicity, country of birth, household income, parent education, and site.

Table 4. Sociodemographic associations with screen time in the Adolescent Brain Cognitive Development (ABCD) Study, stratified by income

	Total screen time		Television		Videos (YouTube)		Video games		Social networking		Texting		Video chat	
	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p
Income less than \$75,000	reference		reference		reference		reference		reference		reference		reference	
Female														
Male	0.83 (0.63 - 1.02)	<0.001	0.05 (-0.02 - 0.12)	0.185	0.20 (0.13- 0.30)	<0.001	0.78 (0.71-0.85)	<0.001	-0.07 (-0.10 - -0.04)	<0.001	-0.09 (-0.13 - -0.05)	<0.001	-0.06 (-0.09 - -0.02)	<0.001
Race/ethnicity														
White	reference		reference		reference		reference		reference		reference		reference	
Latinx / Hispanic	0.03 (-0.31 - 0.38)	0.853	-0.02 (-0.09 - -0.14)	0.676	0.05 (-0.08 - 0.17)	0.47	-0.04 (-0.15 - 0.08)	0.534	-0.01 (-0.06 - -0.04)	0.587	0.00 (-0.06 - 0.07)	0.959	0.02 (-0.04 - 0.08)	0.58
Black	1.47 (1.19 - 1.76)	<0.001	0.32 (0.23 - 0.42)	0.676	0.35 (0.25 - 0.46)	<0.001	0.24 (0.15 - 0.34)	<0.001	0.13 (0.08 - 0.18)	<0.001	0.23 (0.17 - 0.29)	<0.001	0.17 (0.12 - 0.22)	<0.001
Asian	-0.44 (-0.97 - -0.09)	0.106	-0.17 (-0.39 - -0.04)	0.112	-0.10 (-0.29 - -0.10)	0.33	-0.03 (-0.23 - -0.17)	0.761	-0.08 (-0.12 - -0.04)	<0.001	-0.06 (-0.12 - -0.01)	0.035	-0.01 (-0.08 - -0.07)	0.858
Native American	0.28 (-0.20 - 0.76)	0.256	-0.03 (-0.21 - -0.15)	0.73	0.10 (-0.11 - 0.31)	0.151	0.13 (-0.07 - 0.33)	0.247	0.02 (-0.06 - 0.10)	0.679	0.01 (-0.07 - 0.10)	0.699	0.04 (-0.03 - 0.11)	0.296
Other	0.04 (-1.32 - 1.40)	0.950	-0.13 (-0.49 - 0.24)	0.501	-0.10 (-0.47 - -0.28)	0.63	-0.18 (-0.54 - -0.19)	0.352	0.19 (-0.10 - 0.48)	0.197	0.13 (-0.04 - 0.29)	0.129	0.09 (-0.13 - 0.30)	0.416
Country of birth														
USA	reference		reference		reference		reference		reference		reference		reference	
Other country	0.05 (-0.51-0.61)	0.862	-0.10 (-0.29-0.09)	0.298	0.12 (-0.09-0.33)	0.266	-0.72 (-0.27-0.13)	0.482	0.042 (-0.04-0.12)	0.306	0.10 (-0.03-0.22)	0.136	0.02 (-0.09-0.14)	0.698
Parent's highest education														
College education or more	reference		reference		reference		reference		reference		reference		reference	

	Total screen time		Television		Videos (YouTube)		Video games		Social networking		Texting		Video chat	
	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p
Income less than \$75,000	0.21 (-0.03-0.45)	0.083	-0.07 (-0.15 -0.01)	0.008	0.11 (0.02-0.20)	0.021	0.08 (0.00 - 0.17)	0.059	0.02 (-0.02-0.06)	0.262	0.06 (0.01-0.11)	0.015	0.03 (-0.1-0.07)	0.131
High school education or less														
Income \$75,000 and greater														
Sex														
Female	reference		reference		reference		reference		reference		reference		reference	
Male	0.65 (0.52 - 0.78)	<0.001	0.02 (-0.03 - 0.07)	0.45	0.17 (0.12 - 0.23)	<0.001	0.56 (0.51-0.60)	<0.001	-0.03 (-0.04 - -0.01)	<0.001	-0.05 (-0.08 - -0.03)	<0.001	-0.02 (-0.04 - -0.00)	0.033
Race/ethnicity														
White	reference		reference		reference		reference		reference		reference		reference	
Latinx / Hispanic	0.64 (0.36 - 0.91)	<0.001	0.14 (0.04-0.24)	0.005	0.20 (0.09-0.30)	<0.001	0.12 (0.03-0.22)	0.012	0.02 (-0.01-0.05)	0.213	0.09 (0.04-0.14)	<0.001	0.07 (0.02-0.12)	0.009
Black	1.65 (1.31-1.98)	<0.001	0.42 (0.30-0.54)	<0.001	0.50 (0.36-0.62)	<0.001	0.36 (0.24-0.48)	<0.001	0.07 (0.03-0.11)	<0.001	0.15 (0.08-0.22)	<0.001	0.15 (0.09-0.22)	<0.001
Asian	-0.29 (-0.57 - -0.02)	0.039	-0.14 (-0.25 - -0.03)	0.017	-0.01 (-0.13-0.11)	0.881	-0.12 (-0.22 - -0.03)	0.011	-0.014 (-0.03-0.10)	0.246	-0.01 (-0.05-0.03)	0.668	0.00 (-0.03-0.03)	0.897
Native American	0.44 (-0.33-0.92)	0.068	0.08 (-0.15-0.31)	0.493	0.20 (-0.41-0.45)	0.103	0.08 (-0.11-0.26)	0.415	-0.01 (-0.04-0.04)	0.978	0.06 (0.00-0.12)	0.052	0.02 (-0.05-0.09)	0.593
Other	0.41 (-0.55-1.36)	0.402	0.15 (-0.20-0.51)	0.389	-0.14 (-0.40-0.11)	0.277	0.21 (-0.24-0.67)	0.363	0.03 (-0.06-0.12)	0.48	0.10 (-0.76-0.28)	0.262	0.05 (-0.07-0.17)	0.416
Country of birth														
USA	reference		reference		reference		reference		reference		reference		reference	
Other country	-0.17 (-0.64-0.29)	0.467	-0.10 (-0.26-0.71)	0.262	-0.73 (-0.24-0.09)	0.382	-0.07 (-0.23-0.09)	0.385	0.06 (-0.02-0.14)	0.165	-0.02 (-0.09-0.04)	0.531	0.02 (-0.04-0.09)	0.481

	Total screen time		Television		Videos (YouTube)		Video games		Social networking		Texting		Video chat	
	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p	B (95% CI)	p
Income less than \$75,000														
Parent's highest education	reference		reference		reference		reference		reference		reference		reference	
College education or more														
High school education or less	1.05 (0.55-1.56)	<0.001	0.27 (0.09-0.45)	0.003	0.35 (0.16-0.54)	<0.001	0.24 (0.05-0.43)	0.012	0.07 (0.02-0.13)	0.005	0.10 (0.01-0.20)	0.029	0.01 (-0.05-0.08)	0.673

Bold indicates p<0.05. ABCD propensity weights were applied to match key sociodemographic variables in the ABCD Study to the American Community Survey from the US Census.

All models include sex, race/ethnicity, country of birth, parent education, and site.