Parent-Adolescent Discrepancies in Adolescent Recreational Screen Time Reporting During the Coronavirus Disease 2019 Pandemic

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ABSTRACT

OBJECTIVE: To describe the relationship between parent and adolescent reports of adolescent recreational screen time and to determine sociodemographic predictors of recreational screen time reporting differences during the coronavirus disease 2019 pandemic.

METHODS: We analyzed data from the Adolescent Brain Cognitive Development Study (N = 5335, ages 10−14) a national prospective cohort study in the United States collected in May 2020. We compared parent-reported, adolescent-reported, and a parent-adolescent differences in recreational screen time hours per day across 5 screen categories.

RESULTS: Adolescents' total recreational screen time per day was reported as 4.46 hours by parents and 3.87 hours by adolescents. Parents reported higher levels of their child's texting, video chatting, and total recreational screen time, while adolescents reported higher multiplayer gaming and social media

use. Larger discrepancies in total recreational screen time were found in older, Black, and Latino/Hispanic adolescents. Larger discrepancies in total recreational screen time were also found among unmarried/unpartnered parents.

CONCLUSIONS: Given discrepancies in parent-adolescent recreational screen time reporting during the pandemic, a period of high screen use, pediatricians should encourage family discussions about adolescent media use through the development of a Family Media Use Plan. The digital media industry could provide more opportunities for parental monitoring of recreational screen time within product designs.

KEYWORDS: adolescents; coronavirus disease 2019; media use; parents; screen time

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WHAT'S NEW

In this national study of 5335 adolescents-parent dyads early in the coronavirus disease 2019 pandemic, adolescent and parent reports of adolescent screen time differed, and these discrepancies were more evident in older, Black, and Latino/Hispanic adolescents, and adolescents with unmarried/unpartnered parents.

THE ADVANCEMENT AND accessibility of technology has led to the rapid increase of children and adolescents using screens to facilitate their interactions with the world. Though the effects of screen time are nuanced and depend on factors such as level of engagement,[1,2] studies have linked excessive screen time with adverse effects on children's health, including depression, anxiety, inattention, poor sleep, and physical inactivity.[3−7] As such, the American Academy of Pediatrics recommends limiting media usage in children of all ages.[8−10] Screen use among adolescents drastically increased during the coronavirus

disease 2019 (COVID-19) pandemic as schools transitioned to remote learning, extracurricular activities were cancelled or became virtual, and adolescents had more time for screens.[11−14] High levels of screen usage are likely to persist as virtual and hybrid options may remain beyond the pandemic. Thus, for parents and pediatricians, it is now more important than ever to accurately capture screen time patterns among adolescents.

Studies examining screen time measures during the COVID-19 pandemic have mostly used parent-reported versus adolescent-reported screen time.[15−17] Reasons for this approach may include the feasibility of interviewing parents versus children as well as concerns that children and adolescents may not accurately assess their own screen time usage.[18] However, the relationship between parent and adolescent measures as well as between these measures and the true amount of screen time is unclear.[19−25] Further investigation of adolescent-reported screen time as a valid measure and comparing it to parent-reported would allow for a more nuanced understanding

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of adolescent screen time usage and may also elucidate parental awareness of their child's screen time. Some reports have found evidence of discordance between adolescent and parent reports of adolescent screen time usage, suggesting that adolescent self-reported screen time is a better predictor of actual screen time.[21] Other studies have found no significant difference between the 2 measures.[22] Although objective screen time measures could elucidate this discrepancy, they are typically limited to single devices and fail to capture all the various modalities that adolescents utilize, such as computers, television, tablets, and video games.[26] Sociodemographic factors have also been found to influence how closely parents monitor their child's media consumption[21]; however, these relationships have not been examined during COVID-19 pandemic, a time of increased media usage.

Our study aims to describe the relationship between parent and adolescent reports of adolescent recreational screen time and to determine sociodemographic correlates of recreational screen time reporting differences in a national sample of adolescents early in the COVID-19 pandemic.

METHOD

STUDY POPULATION

The Adolescent Brain Cognitive Development Study (ABCD) is a national (though not nationally representative), prospective cohort study of 11,875 US children, recruited from 21 different US sites. The University of California, San Diego provided centralized institutional review board approval and each participating site received local institutional review board approval. Parents and guardians provided informed consent and written permission for adolescents to participate in the study. The ABCD study explores various environmental, developmental, and neurobiological factors that may affect adolescent mental and physical health over the course of their adolescence and follows participants for 10 years. More information about the ABCD sample, recruitment, processes, and measures has been made available by the study investigators.[27]

With the onset of the global COVID-19 pandemic in 2020, the ABCD study sent out supplemental survey materials at 3 time points to adolescent participants (n = 7858 completing 1+ survey, aged 10−14 years-old) and their parents/guardians (N = 7751 completing 1+ survey) to collect data (ABCD Data Release 3.0) regarding the impact of the pandemic on the lives of adolescents and their families. We analyzed data from Survey 1 collected from May 16 to 22, 2020. Participants who completed the COVID-19 ABCD surveys out of order, and participants with missing recreational screen time, sociodemographic, and/or incomplete parent/adolescent dyad data, were excluded from the analysis, resulting in an analytic sample of 5335 participants. Appendix A shows a comparison of participants included versus excluded (due to loss-to follow-up or missing data).

MEASURES

SOCIODEMOGRAPHIC FACTORS

Sociodemographic characteristics were based on parent report and included adolescent characteristics such as age (continuous), sex (male or female), race/ethnicity (White, Latinx/Hispanic, Black, Asian, Native American, other), primary language (English or other), and country of birth (United States or outside United States). Parent and household characteristics included household income (less than $75,000 and $75,000 and greater, as this approximated the median household income in the United States), highest parent education (high school or less versus college education or more), and parent marital status (married/partnered or unmarried/unpartnered).[27]

RECREATIONAL SCREEN TIME

Adolescents and parents reported time spent in a typical day for the adolescent using screens in a recreational capacity. Given that many participants were likely to be home either without school or in virtual school during these assessments, recreational screen time was not captured for weekdays versus weekends independently, as was done in prepandemic ABCD annual data collections. Recreational screen time excluded screen time related to school as was stated in each question as "Do NOT include time spent on school related work".[28] Adolescents and parents were asked to estimate adolescent's total recreational screen time in a typical day in the past week. They were also asked to estimate adolescents' recreational time spent on an average day in the past week on different screen types (adolescents: watching/streaming movies, videos, television; single-player video games; multiplayer video games; texting; social media; video chat; internet; parents: multiplayer video games, social media, texting, video chat). See the Supplemental Information for a full list of the recreational screen time questions asked of adolescents and parents.

STATISTICAL ANALYSIS

We compared parent- and adolescent-reported recreational screen time in hours as a continuous variable across a reported total and 4 categories (multiplayer gaming, texting, social media use, and video chatting). Within each category of parent- and adolescent-reported recreational screen time, the Winsorization method was applied at the 99th percentile to minimize the impact of extreme values within the respective distributions of each recreational screen time category.[29]

Differences in parent- and adolescent-reported recreational screen time were determined by subtracting adolescent-reported recreational screen time hours from parent-reported recreational screen time hours. To assess the degree of similarity between reports, we computed within-dyad correlations between parent- and adolescent-reported recreational screen time using

a weighted intraclass correlation coefficient (ICC) for each of the 5 recreational screen time categories. ICC analyses also assessed the utility of conducting paired *t* tests, which were then used to examine overall differences in recreational screen time hours among parent-adolescent dyads.

Total recreational screen time was further examined among parent-adolescent dyads according to sociodemographic characteristics including sex, race, country of birth, primary language, parent marital status, parent education, and household income. P-values were assessed using analysis of variance to determine if parent- and adolescent-reported total recreational screen time differed by sociodemographic characteristics.

Linear regression analyses assessed whether sociodemographic characteristics (adolescent age, sex, race, country of birth, primary language, parent marital status, parent education, and household income) were associated with absolute differences in parent-adolescent-reported recreational screen time across screen time categories. All data analyses were conducted in 2021 using Stata 15.1 (StataCorp, College Station, TX) utilized a statistical significance threshold of $P = .05$, and applied propensity weights to match key sociodemographic variables in ABCD Study to the American Community Survey by the US Census.[30]

Results

Table 1 describes the sociodemographic characteristics of the 5335 participants included in this analysis. The analytic sample was 12.5 ± 0.9 years-old, half were female, and 39% represented racial/ethnic minority populations. Approximately 46% of adolescents were from households below the median income of $75,000 and 88% had a parent with a college education or higher.

Table 2 presents parent-reported recreational screen time, adolescent-reported recreational screen time, and parent-adolescent difference scores compared across the reported total and individual categories. Overall, parents reported higher average recreational screen time (4.46 ± 2.89 hours) compared to their children (3.87 ± 3.29 hours). Parents reported higher levels of their child's recreational screen time in texting ($P< .001$) and video chatting ($P < .001$), while adolescents reported higher levels of multi-player gaming ($P = .01$) and social media use ($P = .003$). The differences between parent and adolescent reports on recreational screen time were the greatest for the categories of texting (difference of 0.32 hours) and video-chatting (difference of 0.31 hours). Within-dyadic correlations in recreational screen time reports between parents and adolescents were weak to moderate for each recreational screen time category (all P values were <.01), with ICCs ranging from 0.29 (texting) to 0.51 (multi-player gaming).

Table 3 specifically summarizes unadjusted parent-adolescent total recreational screen time difference scores by

Table 1. Sociodemographic Characteristics of 5335 Participants in the Adolescent Brain Cognitive Development (ABCD) Study, May 2020

Sociodemographic Characteristics	Mean (SD) / %
Adolescent characteristics	
Age (years)	12.5 (0.9)
Sex (%)	
Female	50.9%
Male	49.1%
Race/ethnicity (%)	
White	61.3%
Latino / Hispanic	16.8%
Black	10.8%
Asian	7.3%
Native American	2.5%
Other	1.4%
Country of birth (%)	
United States	96.2%
Outside of United States	3.8%
Primary language (%)	
English	89.6%
Non-English	10.4%
Parent characteristics	
Marital status (%)	
Married/partnered	75.7%
Unmarried/unpartnered	24.3%
Education (%)	
College education or more	87.6%
High school education or less	12.5%
Household income (%)	
Less than $25,000	11.1%
$25,000 through $49,999	16.8%
$50,000 through $74,999	18.3%
$75,000 through $99,999	18.4%
$100,000 through $199,999	26.9%
$200,000 and greater	8.6%

Propensity weights from the Adolescent Brain Cognitive Development Study were applied based on the American Community Survey from the US Census.

sociodemographic characteristic. Significant differences in total recreational screen time were found for parent-adolescent dyads in which the parents were married/partnered versus unmarried/unpartnered, but not for other sociodemographic characteristics.

Table 4 presents linear regression analyses assessing absolute differences in parent- and adolescent-reported recreational screen time after adjusting for sociodemographic covariates and results are summarized as follows. Notably, parent-adolescent dyads of adolescent males had larger discrepancies in multi-player gaming screen time compared to those of female adolescents. Households composed of unmarried/unpartnered parents had larger differences in texting and social media. Compared to White parent-adolescent dyads, Latino/Hispanic dyads had larger discrepancies in total, multi-player gaming, texting, and social media screen time, while Black dyads had larger discrepancies across all recreational screen time modalities. Finally, dyads with adolescents born outside of the United States had higher discrepancies in social media, and video chatting, whereas dyads with

Table 2. Parent- Versus Adolescent-Reported Daily Recreational Screen Time in Hours per Day, ABCD Study, May 2020 (n = 5335)

	Parent Mean (SD)	Adolescent Mean (SD)	Difference Mean (95% CI)	t	P	ICC (95% CI)
Total	4.46 (2.89)	3.87 (3.29)	0.58 (0.47, 0.69)	**10.58**	**<.001**	0.43 (0.39, 0.46)
Multiplayer gaming	1.36 (2.02)	1.44 (2.23)	-0.08 (-0.15, -0.02)	**-2.59**	**.010**	0.51 (0.48, 0.55)
Texting	1.16 (1.60)	0.84 (1.52)	0.32 (0.26, 0.37)	**10.89**	**<.001**	0.29 (0.25, 0.34)
Social media	0.89 (1.49)	0.98 (1.68)	-0.09 (-0.14, -0.03)	**-3.02**	**.003**	0.34 (0.30, 0.38)
Video chatting	0.95 (1.33)	0.65 (1.18)	0.31 (0.26, 0.35)	**13.49**	**<.001**	0.32 (0.29, 0.36)

t indicates paired t tests; ICC, intraclass correlation coefficient; SD, standard deviation; CI, confidence interval; and ABCD, Adolescent Brain Cognitive Development.
Bold indicates $P < .05$.

adolescents who speak a non-English primary language had lower discrepancies in video gaming.

DISCUSSION

In this study of 10- to 14-year-old adolescents roughly within the first year of the COVID-19 pandemic, we found that parents reported an average of 4.5 daily hours of total recreational screen time. The adolescents themselves reported modestly lower volumes of 3.9 hours daily. It is noteworthy that these estimates exclude screen time devoted to school work; thus, total daily screen time estimates for adolescents are likely substantially higher. As has been shown previously, the overall recreational screen

time of adolescents substantially increased during the COVID-19 pandemic.[11−14] It is important that parents attend to their children's media diets, especially since excessive screen use may be associated with adverse mental and physical health risks.[3−7] This study demonstrates a disconnect across multiple media types and the volume of media consumption.

DISCREPANCIES BETWEEN PARENT- AND ADOLESCENT-REPORTED SCREEN TIME DURING THE COVID-19 PANDEMIC

We find that parent and adolescent reports varied in number of hours reported based on the type of recreational

Table 3. Summary of Difference Scores in Parent- and Adolescent-Reported Total Recreational Screen Time During the COVID-19 Pandemic by Sociodemographic Characteristics in the Adolescent Brain Cognitive Development (ABCD) Study, May 2020 (n = 5335)

	Total Recreational Screen Time			
Sociodemographic Characteristics	Parent Reported Mean (SD)	Adolescent Reported Mean (SD)	Difference Mean (SD)	P*
Adolescent characteristics				
Sex				.79
Female	4.33 (2.88)	3.76 (3.21)	0.57 (3.42)	
Male	4.59 (2.90)	3.99 (3.37)	0.60 (3.48)	
Race/ethnicity				.45
White	4.34 (2.77)	3.68 (3.01)	0.65 (3.10)	
Latino / Hispanic	4.58 (2.60)	4.07 (3.36)	0.52 (3.54)	
Black	4.93 (3.81)	4.63 (4.42)	0.29 (4.73)	
Asian	4.35 (2.92)	3.58 (3.02)	0.76 (3.30)	
Native American	4.84 (3.71)	4.28 (3.84)	0.52 (4.37)	
Other	4.74 (2.36)	4.80 (3.44)	0.03 (4.03)	
Country of birth				.30
United States	4.39 (2.60)	4.15 (3.25)	0.23 (3.42)	
Outside of United States	4.46 (2.90)	3.86 (3.29)	0.60 (3.44)	
Primary language				.46
English	4.46 (2.95)	3.86 (3.30)	0.60 (3.46)	
Non-English	4.43 (2.45)	3.98 (3.11)	0.45 (3.26)	
Parent characteristics				
Parent marital status				**.04**
Married/partnered	4.37 (2.89)	3.70 (3.20)	0.66 (3.36)	
Unmarried/unpartnered	4.75 (2.78)	4.40 (3.31)	0.34 (3.50)	
Highest parent education				.75
College education or more	4.43 (2.87)	3.83 (3.25)	0.59 (3.39)	
High school education or less	4.68 (3.00)	4.13 (3.45)	0.53 (3.69)	
Household income				.18
$75,000 and greater	4.34 (3.01)	3.68 (3.27)	0.65 (3.45)	
Less than $75,000	4.60 (2.64)	4.10 (3.11)	0.50 (3.25)	

SD indicates standard deviation.
Bold indicates $P < .05$.
*P values were assessed using analysis of variance.

Table 4. Sociodemographic Associations With Absolute Differences in Parent- and Adolescent-Reported Recreational Screen Time During the COVID-19 Pandemic in the Adolescent Brain Cognitive Development (ABCD) Study, May 2020 (n = 5335)

Sociodemographic Characteristics	Total Recreational Screen Time		Multiplayer Gaming		Texting		Social Media		Video Chatting	
	B (95% CI)	P	B (95% CI)	P	B (95% CI)	P	B (95% CI)	P	B (95% CI)	P
Adolescent characteristics										
Age	**0.20 (0.11, 0.29)**	**<.001**	-0.01 (-0.07, 0.05)	.79	**0.18 (0.12, 0.24)**	**<.001**	**0.21 (0.16, 0.27)**	**<.001**	0.04 (0.00, 0.09)	.07
Sex										
Female	Reference		Reference		Reference		Reference		Reference	
Male	0.01 (-0.14, 0.17)	.864	**0.88 (0.78, 0.98)**	**<.001**	**-0.20 (-0.29, -0.11)**	**<.001**	**-0.30 (-0.39, -0.20)**	**<.001**	**-0.11 (-0.18, -0.03)**	**.005**
Race/ethnicity										
White	Reference		Reference		Reference		Reference		Reference	
Latino / Hispanic	**0.30 (0.02, 0.58)**	**.04**	**0.20 (0.02, 0.39)**	**.03**	**0.30 (0.14, 0.46)**	**<.001**	**0.23 (0.08, 0.38)**	**.003**	0.09 (-0.04, 0.22)	.16
Black	**0.68 (0.36, 1.00)**	**<.001**	**0.28 (0.08, 0.48)**	**.005**	**0.64 (0.44, 0.84)**	**<.001**	**0.46 (0.27, 0.64)**	**<.001**	**0.27 (0.13, 0.41)**	**<.001**
Asian	0.03 (-0.30, 0.35)	.872	-0.04 (-0.23, 0.15)	.66	-0.10 (-0.27, 0.07)	.27	-0.12 (-0.28, 0.04)	.13	-0.04 (-0.20, 0.12)	.63
Native American	0.61 (-0.17, 1.38)	.124	-0.09 (-0.43, 0.25)	.62	0.25 (-0.12, 0.62)	.18	0.13 (-0.26, 0.53)	.51	0.15 (-0.15, 0.45)	.34
Other	1.29 (0.00, 2.58)	.05	0.23 (-0.25, 0.71)	.34	0.04 (-0.36, 0.44)	.85	**0.83 (0.10, 1.57)**	**.03**	0.26 (-0.31, 0.84)	.37
Country of birth										
United States	Reference		Reference		Reference		Reference		Reference	
Outside of United States	0.31 (-0.22, 0.84)	.24	0.28 (-0.02, 0.59)	.07	0.19 (-0.11, 0.49)	.22	**0.35 (0.02, 0.68)**	**.04**	**0.30 (0.02, 0.57)**	**.04**
Primary language										
English	Reference		Reference		Reference		Reference		Reference	
Non-English	-0.22 (-0.58, 0.14)	.24	**-0.39 (-0.62, -0.16)**	**.001**	-0.05 (-0.24, 0.13)	.58	-0.03 (-0.21, 0.15)	.75	-0.07 (-0.23, 0.09)	.40
Parent characteristics										
Marital status										
Married/partnered	Reference		Reference		Reference		Reference		Reference	
Unmarried/unpartnered	**0.32 (0.07, 0.56)**	**.01**	0.10 (-0.05, 0.26)	.19	**0.19 (0.04, 0.33)**	**.01**	**0.19 (0.05, 0.34)**	**.009**	0.10 (-0.01, 0.21)	.09
Highest parent education										
College education or more	Reference		Reference		Reference		Reference		Reference	
High school education or less	0.19 (-0.13, 0.52)	.25	**0.28 (0.05, 0.50)**	**.02**	**0.20 (0.02, 0.37)**	**.03**	0.17 (-0.01, 0.36)	.07	0.11 (-0.04, 0.26)	.15
Household income										
$75,000 and greater	Reference		Reference		Reference		Reference		Reference	
Less than $75,000	0.19 (-0.01, 0.39)	.06	**0.15 (0.03, 0.27)**	**.02**	**0.14 (0.02, 0.25)**	**.03**	**0.12 (0.01, 0.23)**	**.04**	0.07 (-0.02, 0.16)	.11

CI indicates confidence interval; B, regression coefficient from linear regression.

Bold indicates $P < .05$.

The outputs represent a series of linear regression models with the column header (screen time) as the dependent variable and the row header (sociodemographic characteristics) as the independent variables. The table represents the outputs from 5 regression models in total, adjusted for all listed sociodemographic characteristics. Propensity weights from the Adolescent Brain Cognitive Development Study were applied based on the American Community Survey from the US Census.

screen time. Overall, parents reported higher amounts of adolescent recreational screen time than adolescent self-report. While parents reported greater hours for texting and video chatting, they reported fewer hours of multi-player gaming and social media usage compared to adolescent self-reports. One prior study using (younger) baseline data from the same ABCD Study cohort reported on here found that parents' estimates of recreational screen time was lower than that of their children.[31] During the pandemic, parents and adolescents were both at home more, so parents may be more aware of their children's use and assume they are on screens during recreational time given fewer alternative activities when isolated at home. In addition, adolescents could be underreporting their recreational screen time due to social desirability bias, particularly if they know their levels are higher during the pandemic. Prior research has demonstrated slight discrepancies in parent and adolescent reports of screen time; however, the magnitude of these differences has been small, with reports within 10 minutes of one another.[22] Though our study found similarly small differences between parent and adolescent reports of social media usage and multi-player game, we demonstrate much larger discrepancies in reports of overall recreational screen time, texting, and video chatting, with differences between reports of 20 to 30 minutes during COVID-19.

One reason for this divergence could be due to the age of adolescent participants. In prior research looking at concordance of parent-adolescent reports of recreational screen time, participants were younger adolescents (9−11 years-old) as compared to adolescents in our study (10−14 years-old).[22] Parental monitoring of adolescent recreational screen time tends to be higher in younger adolescents due to parental concerns around child development.[18] In addition, parents and adolescents may be reporting on screen multitasking differently.

Upon statistical testing of parent and adolescent mean recreational screen time, results show significant differences between parent and adolescent reports across all screen time types during COVID-19. Prior research has shown that parent and adolescent reports vary as to who records more adolescent screen time utilization.[22,24,25,32] Most adolescents track or monitor their total screen time less frequently compared to their parents.[18] It is possible that parents report more adolescent screen time because of more deliberate parental monitoring of technology usage, especially during early adolescence.[18] At the same time, parents may also be prone to under report adolescent screen time for a variety of factors, including lack of parental knowledge about extent of adolescent technology use and desirability biases.[21,24] Additionally, with the evolution of technology, adolescents and their parents may have different conceptions of what constitutes different types of media, which may impact recreational screen time reporting.

SUMMARY AND ASSOCIATIONS OF DIFFERENCES IN PARENT- AND ADOLESCENT-REPORTED TOTAL RECREATIONAL SCREEN TIME DURING THE COVID-19 PANDEMIC BY SOCIODEMOGRAPHIC CHARACTERISTICS

Prior parent-adolescent report concordance studies have shown significant differences between reports across sociodemographic characteristics.[33,34] Our finding that households composed of unmarried/unpartnered parents have higher differences in parent- and adolescent- recreational screen time reports are consistent with prior work demonstrating that 2 parent households have more capacity to monitor media usage.[21] Our age-related findings mirror prior studies demonstrating that parent reports become more dissimilar from adolescent reports as their child ages.[35,36] This relationship may be due to greater adolescent independence and lesser parental monitoring during adolescence.[21] It is well documented that boys engage with screens for more hours each day than girls.[37−39] Boys tend to engage with screens more through video gaming and watching and streaming videos as compared to girls.[37,38] Parental reports of time spent playing video games may be higher in adolescent boys because of this tendency. Additionally, many parents monitor adolescent mobile screen time via mobile applications.[18] This ability to diligently track amount of time adolescent spend on their mobile phones may account for the higher rates of parent-child agreement among boys.

Parents of Black and Latino/Hispanic families during the COVID-19 pandemic have been disproportionately affected as evidenced by increased number of cases, hospitalizations, and deaths.[40] Moreover, while many people were permitted to work from home to prevent the spread of COVID-19, Black and Latino parents are more likely to be essential workers than their White counterparts.[41] Larger differences in predicted parent- and adolescent-reported recreational screen time may be attributed to the fact that fewer Black and Latino families were able to observe adolescent media usage in the home due to the greater likelihood of holding an essential occupation. Smaller differences in dyad reports for video gaming were found among adolescents whose primary language was not English. One possibility is that non−English-speaking families may be more concerned that their children learn English, so they monitor them more closely including for multiplayer video games. Another possible explanation is that adolescents whose primary language is not English have fewer non-English multiplayer game options or peers to play with.

STRENGTHS AND LIMITATIONS

Strengths of this study include the national study population, parallel questions on recreational screen time asked of both parents and adolescents, differentiation by media type, and a focus on COVID-19 pandemic screen time use. Despite these strengths, there are several limitations

to be considered. Our study was only able to investigate overall recreational screen time, multiplayer gaming, texting, social media use, and video chatting because questions for other reported recreational screen time modalities did not overlap between parent and adolescent ABCD assessments administered during the COVID-19 pandemic. Furthermore, given the diverse screen time modalities observed, parents and adolescents may have differing perceptions of specific utilization, resulting in misclassification. There is the possibility of selection bias since the included subsample retained a higher proportion of female, White, Asian, high-income, married/partnered parents, and higher parent education participants. Given the lack of an expiration date for the parent and adolescent survey they may not have been taken at the same time, and thus, potentially reporting different recreational screen time patterns based on time period (n = 45 parent-adolescent dyads excluded from the analysis). Although participants were asked to report a typical day in the past week, recreational screen time usage may vary week to week, and we are unable to standardize the time frame in which parents and adolescents report recreational screen time hours. The measure did not differentiate between weekday or weekend screen use during the pandemic assuming that most adolescents were at home for school. Additionally, because both parent and adolescent reports are subjective measures of recreational screen time, there is no way to determine which of the reports is most accurate in representing actual adolescent recreational screen time as the research is varied.[18,21,24] Finally, it is unclear if biases exist to favor certain recreational screen time modalities over others and the measurement of recreational screen time in hours may not capture other important nuances like social context, frequency, multitasking, or media content.

IMPLICATIONS AND RECOMMENDATIONS

Our study investigates the relationship between parent and adolescent reports of overall adolescent recreational screen time, multi-player gaming, texting, social media usage, and video-chatting during the COVID-19 pandemic. Findings suggest that parent and adolescent reports of screen time differ during the COVID-19 pandemic, and that these discrepancies are more evident in families of color. These findings have relevance for the ongoing COVID-19 pandemic, for future outbreaks, and for adolescents who are engaged in remote/hybrid learning or homeschooling.

Future studies should consider adding measures that take into consideration adolescents' social context when measuring recreational screen time, digital multitasking, and frequency of technology use to help further develop literature on recreational screen time and adolescents. Additional research is needed to compare parent and adolescent reports of recreational screen time with gold standard objective measures such as ecological momentary assessment programs in order to assess the reliability and validity of both parent and adolescent reports. Future ABCD Study analyses could examine how unique screen modality experiences may predict depression, anxiety, body dissatisfaction, or other mental health outcomes.

These identified socio-economic disparities in recreational screen time reporting differences between parents and adolescents suggest the need for community education around the effects of recreational screen time usage with both adolescents and parents. Policies that help provide digital media literacy and education for adolescents and families can be a powerful way for medical providers and educators to help scaffold adolescent media usage. The digital media industry could provide more opportunities for parental monitoring of recreational screen time within product designs. Given the rise in screen time during the pandemic and discrepancies in parent-adolescent reporting of recreational screen time, pediatricians could consider assessing screen usage in primary care visits and discussing potential risks and benefits. The American Academy of Pediatrics endorses a Family Media Use Plan which encourages parents to develop a personalized plan with their children.[8] Family discussions about types, content, and maximum time for screen use may also promote greater agreement on screen use estimates between parents and children.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at https://doi.org/10.1016/j.acap.2021.12.008.

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