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Young People's Media Use and Remote Schooling Experiences during the COVID-19 Pandemic

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The COVID-19 pandemic dramatically altered the lives of school-aged children and adolescents. Limited opportunities for social interactions, entertainment, and education outside the home moved all related activities online and freed time for additional digital media use. Understanding youth's experiences with remote learning and online social engagement and potential benefits and consequences of these activities can help identify areas of need in the "new normal." Parents of K-12th graders (N=1,569) completed an online survey about their child's media use during the pandemic, their own perception of the impact of this use, and their experiences with remote schooling. Linear regressions identified associations between parent/child characteristics and parental reports. Many young people increased their digital media use during the pandemic. Many connected with friends and family using interactive technology. The majority of parents reported media use as helpful to their child's relationships. Parents with higher socio-economic status indicators and those reporting on daughters saw digital media use as more beneficial. Most parents reported a positive experience with remote schooling and saw it as helpful for children's academic skills; parents with children in private schools provided higher ratings of remote schooling. Following a day of remote schooling, many children experienced physical problems such as headaches, back pain, and eye pain/strain, with higher prevalence among older children and private school students. Overall, children had positive experiences with media during the pandemic, but social resources may allow some to more readily translate use into academic and social benefits.

Keywords: Media use, remote schooling, COVID-19, mental health

While the pandemic has had a massive impact on the lives of all of us, school-aged children and adolescents have faced some unique and especially consequential disruptions. Remote schooling replaced face-to-face instruction overnight. Social and recreational activities were cancelled. Restrictions on travel and gatherings meant that connecting with family, friends, communities and schools became possible only with digital media. Everyone was encouraged to stay home, relying on technology to serve their most critical needs: education, parent employment, communication, physical and mental health care. Prior to the pandemic, 21% of youth (ages 0 to 17) spent four hours or more per day with screens; during the pandemic, that number doubled to 44% (eMarketer, 2020). The current study reports on a national online survey of parents about their children's use of media during the pandemic and perceived effects of this use.

Displacement in the Context of COVID-19

Developed when television was the only screen media in common use, the displacement hypothesis is a conceptual framework that considers time as a finite commodity and asserts that screen media use displaces other activities (Mutz, Roberts, & Vuuren, 1993). According to tenets of the displacement hypothesis, media use is most likely to replace activities that serve similar functions and occur in similar physical locations (Huston, Wright, Marquis, & Green, 1999; Mutz et al., 1993; Neuman, 1995). For some children, screen entertainment may displace play (Hurwitz et al., 2020) both of which are free-time activities that occur in the home. But what happens when all activities outside of the home are cancelled and young people are forced to spend greatly increased time in their home? Educational and social activities must now occur in the same setting (not only in the home, but on the screen) and are, according to the displacement hypothesis, susceptible to displacement by entertainment media. The displacement framework predicts that during home-based quarantine, school-aged children use entertainment media more, potentially displacing important social and academic activities.

Uses and Gratifications

The uses and gratifications theory proposes that users seek out media that accomplishes their specific needs (Chassiakos & Stager, 2020). In the context of the pandemic, children's needs necessarily broadened from distraction and entertainment to social connection and education. Current digital media, however, can serve functions that television did not. Rather than displacing social interactions, interactive media can be the conduit through which youth connect. Instead of competing with education, internet can share real-time or recorded lessons and experiences and link classroom communities of educators and students. When applied to use during the pandemic, uses and gratifications predicts an increase in using media for specific reasons that align with current needs, including connecting with others and accessing educational opportunities.

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Online Social Ties

The effect of increased media use during the pandemic is, in part, predicated on how, and how well, interactive screens substitute for face-to-face interactions. Traditional social ties provide support that helps prevent mental health problems (Lamblin, Murawski, Whittle, & Fornito, 2017). There is mixed evidence on whether online relationships can serve a similar function. Meta-analyses have shown a small positive association between social media use and depression (Odgers & Jensen, 2020; Odgers & Robb, 2020). There are, however, studies that document positive mental health outcomes associated with online socialization (Bekalu, McCloud, & Viswanath, 2019; Craig, Eaton, McInroy, Leung, & Krishnan, 2021; Uhls, Ellison, & Subrahmanyam, 2017; Weinstein, 2018). One potential explanation for mixed findings in this area is that the effects of online social experiences are influenced by the relationship of the people interacting. Using technology to connect with established friends, as was likely to happen during the pandemic, has been shown to maintain and strengthen these ties, thereby enhancing mental health (Reich, Subrahmanyam, & Espinoza, 2012).

Remote Schooling

During the pandemic, 93% of households with school-aged children across the US were partially or entirely remote schooling using online video conferencing (McElrath, 2020). While online schooling is not a new idea, previously existing models were intentionally designed, developed and evaluated over time, and attended by students choosing this structure. The pandemic forced educators and students into a novel setting and required them to use unfamiliar computer software with little preparation. Students were learning from home with inadequate or unfamiliar new devices, uncertain online connections, often in spaces not optimized ergonomically or ideal for quiet learning.

As with many aspects of schooling, remote learning can suffer from issues related to equity and access (Domina, Renzulli, Murray, Garza, & Perez, 2021). Highly resourced public and private schools can offer more comprehensive remote schooling options including better devices and connectivity. Individual characteristics of the child may also contribute to their remote schooling experience. Understanding which children experienced more successful online learning can help reveal who may need additional assistance as schools create the post-pandemic "new normal."

The Current Study

The goal of this survey is to document families' media use and experiences during this unprecedented school year and determine what factors were associated with their experiences. This survey asked:

1. Have children increased their use of different types of digital media during the COVID-19 pandemic?

2. To what extent did parents consider children's digital media use as having positive or negative effects on their relationships and health?

3. What have been families' experiences with remote schooling and how do parents feel it has influenced students' learning, social skills, and physical health?

For questions 2 and 3 we also sought to determine the individual and family characteristics that were associated with parental perceptions of the effects of pandemic media use and remote schooling.

Method

A nationwide online survey of 1,569 parents of children in grades K–12 was conducted from March 9–15, 2021. The sample was recruited through Alchemer, an online research service, and their network of partners that includes over 350 existing survey panels with a total reach of over 437 million users worldwide. Upon opting into this network, respondents provide a standard profile of information, agree to have survey invitations sent to them, and receive compensation via a point system according to the length of each survey completed.

Participants. Adults, 18 years and older, in the U.S. with a child between the ages of 5 and 17 were invited to respond to the survey with a goal of obtaining at least 1,500 responses. Quotas for grade of child and race/ethnicity were used to obtain a diverse sample. Sample demographics are reported in Table 1.

Table 1. ***Sample Demographics.***

Variable	*n*	%
Mean Child Age	11.3 years	SD=3.7
Child Gender		
Male	972	62.0
Female	592	38.0
Child Grade		
Elementary school (grades K-4)	600	38.5
Middle school (grades 5-8)	500	32.1
High school (grades 9-12)	458	29.4
School Type		
Public	950	60.7
Private	485	31.0
Homeschool	131	8.4
Race		
American Indian	18	1.1
Asian	96	6.1
Black/Non-Hispanic	210	13.4
Hispanic	86	5.5
Native Hawaiian	3	0.2
Middle Eastern	3	0.2
White/Non-Hispanic	1111	70.8
Mixed race	24	1.5
Other	11	0.7
Parent Gender		
Male	864	55.2
Female	700	44.8
Parent Education		
No degree	24	1.5
High school degree or GED	267	17.0
Associate's degree	218	13.9
Bachelor's degree	423	27.0
Master's degree	554	35.4
PhD/ MD/ JD or other advanced degree	80	5.1
Parent Income		
Less than $50,000	309	20.6
$50,000 – $99,999	498	33.1
$100,000 – $149,999	460	30.6
$150,000 – $199,999	166	11.0
$200,000 – $249,999	34	2.3
$250,000 or more	36	2.4

Design. Interested panel participants reviewed an informational study page and provided consent by clicking a

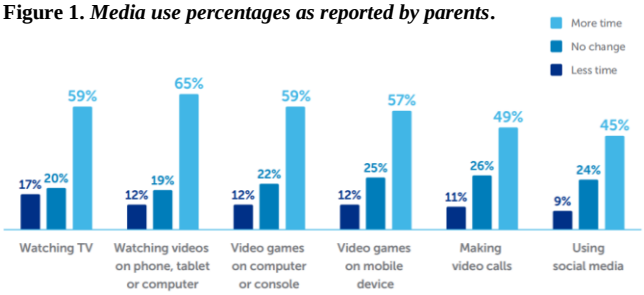
button to opt into the survey. They were then asked three qualification questions (age, country of residence, and parent/guardian of a child who is currently in grade K-12) to ensure eligibility, followed by up to 49 questions. The survey took approximately 15 minutes to complete, and asked participants about their child's media use habits, physical, educational, and social wellness, connectivity, and school environment/remote schooling during the pandemic. The survey also contained three validity checks to ensure data quality. The Boston Children's Hospital IRB reviewed the survey methodology and classified it as exempt from ethical review.

Analyses. Data were analyzed using IBM SPSS Statistics for Windows, Version 24.0. Linear regressions were conducted to assess associations between multiple family and child characteristics and parental reports regarding the impact of children's media use and their experiences with remote learning. For the race/ethnicity variable in the analyses, an "other/mixed race" variable that included American Indian, Native Hawaiian, Middle Eastern, mixed race, and other was included along with Black Non-Hispanic, Hispanic, and Asian. White Non-Hispanic was the reference category.

Results

The majority of parents reported that their children spent more time doing each of the following: Watching TV, watching videos/movies/TV shows on a computer or mobile device, playing video games on a console/computer, and playing video games on a mobile device (see Figure 1). For each of the media use activities (including video calls and social media), more than 20% (20.4%-28.9%) reported that their child increased these behaviors by "a lot."

Figure 1. ***Media use percentages as reported by parents.***



Note. Less time includes answer choices "reduced a lot" and "reduced a little"; more time includes answer choices "increased a lot" and "increased a little".

More than 2/3 of children used video calls to connect with family and friends. Over half of them connected with family and friends using social media. Chatting during video games with friends and family was also prevalent (see Table 2).

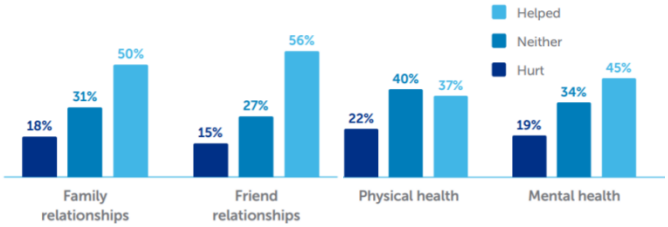
When asked if their child's digital media use hurt or helped their child in multiple domains, approximately 50% said it helped "a little" or "a lot" with their relationships with their families (49.9%) and friends (55.8%: see Figure 2).

Table 2. ***Percentage of children connecting with family and friends using media as reported by parents.***

Media type	Family	Friends
Video calls	71.3%	69.2%
Voice or texting chatting within video games	34.2%	51.3%
Voice or text chatting in online services	29.5%	36.4%
Social networking	51.2%	53.5%

Results from the regression analyses indicate that the following characteristics were associated with parents reporting that their child's media use improved their connections with family and friends: female child, more educated parents, and increased child media use (see Table 4).

Figure 2. ***Media effects on child well-being as reported by parents.***



Note. Hurt includes answer choices "hurt a lot" and "hurt a little"; helped includes answer choices "helped a lot" and "helped a little".

While nearly half of parents felt that their child's media use was helpful for their mental health (45.4%), only 36.7% reported that it was helpful for their physical health (see Figure 2). Parents reported that media use was more helpful to their child's mental and physical health when they were reporting about a daughter, had higher incomes, and were more educated (see Table 4).

Nearly 2/3 (65.8%) of the sample reported that their child had been in remote or hybrid learning during at least some of the pandemic. Of these parents, 61.75% reported that their child had a "somewhat" (43.6%) or "very" (18.1%) positive experience with remote learning. Fewer had a "somewhat" (13.0%) or "very" (3.3%) negative experience. Attending a private school, having higher parental education and family income as well as being Black Non-Hispanic were all predictive of the child having a more positive remote learning experience (see Table 5).

Slightly more than half of the parents said that hybrid/remote schooling helped their child with their reading skills (51.7%), while slightly less than half claimed that it was helpful for their math (48.1%) and speaking skills (45.2%; see Table 3). Fewer parents reported that remote schooling hurt their child in terms of these skills (ranging from 14.1% for reading skills to 18.2% for math skills). This pattern was different regarding children's social skills with similar proportions reporting that remote/hybrid school helped (39.3%) and hurt (32.4%) their child's abilities. For each of these questions, parents of children attending public schools reported that remote/hybrid schooling was less helpful than did parents of children attending private schools. For some skills,

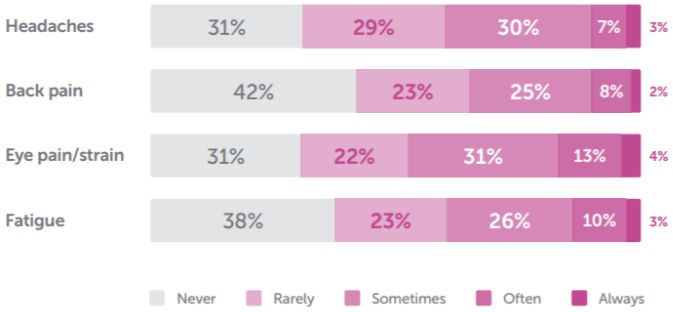
parents who were more educated reported more positive effects of remote schooling and those who were Asian or "Other race" reported more negative effects (see Table 5).

Table 3. ***Parent-reported effects of remote schooling on child skills*.**

Skill	Hurt a lot	Hurt a little	Neither hurt nor helped	Helped a little	Helped a lot
Reading	4.5%	9.6%	32.9%	25.9%	25.8%
Math	5.5%	12.7%	32.5%	25.4%	22.7%
Speaking	4.3%	12.1%	37.2%	22.3%	22.9%
Social	7.5%	24.9%	27.2%	19.8%	19.5%

Although the majority of parents reported that their child "never" or "rarely" experienced physical symptoms following a day of remote schooling, over one third of parents reported that physical complaints occurred "sometimes" or more frequently (see Figure 3). Eye pain/strain after a day of remote schooling was most common, with 48% of parents saying their child experienced this "sometimes," "often," or "always". While back pain was least common, 35% of parents still reported this as occurring "sometimes" or more frequently. Overall, 65.9% of parents reported that their child experienced at least one of these physical problems at least "sometimes" following a day of remote schooling.

Figure 3. Frequency of ***physical problems experienced by children following a day of remote school.***



Not all children were equally likely to experience physical problems (See Table 6). The older a child was, the more frequently they experienced headaches, back pain, and fatigue. Children attending public school were less likely than those attending private school to experience back pain, and eye pain/strain. Finally, Asian and Black Non-Hispanic children were less likely than were White children to experience back pain and eye pain/strain, and Asian children were less likely than White children to have headaches following remote school.

Discussion

Unsurprisingly, a large majority of children in kindergarten through 12th grade increased their use of all types of digital screen media during the pandemic. Video calling was the predominant digital technology used to connect with their friends and family. Most parents believed that digital media use helped children with their relationships with families and friends, their mental health, and their academic achievement. Fewer parents saw digital media as being helpful for their child's physical health, although not many saw it as harmful either.

Nearly 2/3 of parents reported that their child had a positive experience with remote or hybrid schooling and many saw it as helpful to their child's reading and math skills. About 1/3, however, considered remote/hybrid school as harmful to their child's social skills. Many parents reported that their child experienced physical problems following a day of remote schooling with older children, and those attending a private school experiencing these problems more frequently while Asian and Black Non-Hispanic children experiencing them less often.

As indicated by other research, most young people spent more time using digital media during the pandemic than they had previously (eMarketer, 2020). Consistent with a Uses and Gratifications approach, young people used media that filled unmet needs caused by the pandemic, specifically social connections. They used a variety of platforms to connect with friends, more than 2/3 using video calls and over half using video game chat. Consistent with previous research which found that online relationships can serve as close personal ties and improve mental health (Davis, 2012; Dolev-Cohen & Barak, 2013; Frison & Eggermont, 2015; Radovic, Gmelin, Stein, & Miller, 2017), many parents saw their child's connections via digital media as helpful for their social relationships and mental health.

Positive effects of technology use during the pandemic were not the same for all children. Socio-economic status is predictive of access to high quality internet service, evidence of the ongoing digital divide (Calvert, Rideout, Woolard, Barr, & Strouse, 2005). Poor quality or inconsistent internet access may have resulted in increased difficulty staying connected with friends and family during the pandemic. In the current study, family income and parental education was positively associated with parents' reporting that digital media was helpful to their child's relationships with family and friends. Children of lower SES may have had more difficulty translating digital media use into social support as they or their peers may have had poor connectivity or their access deprioritized in favor of parents' employment needs.

Parents were also more likely to say that media use was more beneficial for girls' social relationships than it was for boys'. This finding could be driven by different use patterns between the genders. While social media, texting and chatting are especially popular among girls, boys often use video games as platforms for building and maintaining friendships (Lenhart, 2015). Parents might perceive the types of communication that occur during video games as being less beneficial to social relationships than the types that occur in text, voice, or video conversations. In general, the ways that boys communicate when compared to the ways girls communicate may appear less positive.

A large majority of parents reported that their child had a positive experience with remote schooling that seemed to translate into

Table 4. ***Regression results predicting parent-reported helpfulness of media for health and social outcomes.***

	Physical Health			Mental health			Family relationships			Friendships		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Child age	-0.01	0.01	-0.02	-0.01	0.01	-0.02	0.00	0.01	-0.01	0.01	0.01	0.05
Child gender	0.13	0.06	0.06*	0.19	0.06	0.08**	0.22	0.06	0.09***	0.15	0.06	0.07*
Child media use	-0.01	0.08	0.00	0.10	0.07	0.04	0.16	0.08	0.06*	0.24	0.08	0.08**
Parental education	0.09	0.03	0.10**	0.09	0.03	0.10**	0.06	0.03	0.07*	0.07	0.03	0.07*
Parental income	0.07	0.03	0.08*	0.07	0.03	0.07*	0.03	0.03	0.03	0.09	0.03	0.09**
Race/ethnicity												
Asian	-0.15	0.12	-0.03	-0.17	0.12	-0.04	0.19	0.13	0.04	-0.03	0.13	-0.01
Black/non-Hispanic	0.20	0.09	0.06*	0.15	0.09	0.04	0.32	0.10	0.09**	0.13	0.10	0.04
Hispanic	0.02	0.13	0.00	0.10	0.13	0.02	0.12	0.14	0.02	-0.05	0.14	-0.01
Other	-0.28	0.16	-0.05	-0.29	0.15	-0.05	-0.25	0.16	-0.04	-0.20	0.16	-0.03

Note. *p < .05, **p < .01, ***p < .001

Table 5. ***Regressions results predicting parent-reported experience with remote schooling and its effects on children's skills.***

	Positive experience			Social skills			Math skills			Reading skills		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Child age	0.00	0.01	0.00	0.00	0.01	0.00	-0.01	0.01	-0.04	0.00	0.01	-0.01
Child gender	-0.01	0.07	0.00	0.08	0.08	0.04	-0.02	0.07	-0.01	-0.02	0.06	-0.01
Public school	-0.28	0.08	-0.12***	-0.19	0.09	-0.09*	-0.19	0.08	-0.10*	-0.30	0.07	-0.16***
Parental education	0.08	0.03	0.09*	0.11	0.04	0.13**	0.06	0.03	0.08	0.06	0.03	0.09
Parental income	0.08	0.04	0.08*	0.02	0.04	0.02	0.06	0.04	0.07	0.06	0.03	0.08
Race/ethnicity												
Asian	-0.14	0.13	-0.04	-0.34	0.14	-0.09*	-0.34	0.12	-0.11**	-0.12	0.12	-0.04
Black/non-Hispanic	0.21	0.10	0.07*	0.18	0.11	0.07	0.01	0.10	0.00	0.08	0.09	0.03
Hispanic	-0.05	0.14	-0.01	0.01	0.15	0.00	-0.06	0.13	-0.02	0.15	0.13	0.04
Other	-0.18	0.17	-0.04	0.02	0.18	0.00	-0.38	0.16	-0.09*	-0.54	0.16	-0.13***

Note. *p < .05, **p < .01, ***p < .001

Table 6. ***Regressions results predicting parent-report of frequency of child physical problems following a day of remote schooling.***

	Headaches			Back pain			Eye pain			Fatigue		
Variable	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*	*B*	*SE B*	*β*
Child age	0.03	0.01	0.10**	0.04	0.01	0.13***	0.02	0.01	0.06	0.03	0.01	0.11**
Child gender	-0.05	0.08	-0.03	0.02	0.08	0.01	-0.03	0.09	-0.01	0.13	0.09	0.06
Public school	-0.09	0.09	-0.04	-0.20	0.09	-0.08*	-0.35	0.10	-0.14***	-0.04	0.10	-0.01
Parental education	0.06	0.04	0.07	0.07	0.04	0.08	0.11	0.04	0.11*	0.02	0.04	0.02
Parental income	0.06	0.04	0.06	0.01	0.04	0.01	0.01	0.05	0.01	-0.01	0.05	-0.01
Race/ethnicity												
Asian	-0.46	0.14	-0.12**	-0.50	0.15	-0.13***	-0.40	0.16	-0.10*	-0.18	0.16	-0.05
Black/non-Hispanic	-0.12	0.11	-0.04	-0.31	0.12	-0.10**	-0.25	0.13	-0.08*	0.02	0.13	0.00
Hispanic	-0.10	0.16	-0.02	0.04	0.16	0.01	-0.07	0.17	-0.02	0.07	0.17	0.02
Other	-0.11	0.19	-0.02	-0.15	0.20	-0.03	0.22	0.21	0.04	0.21	0.21	0.04

Note. *p < .05, **p < .01, ***p < .001

contributions to children's math and reading skills. However, attending public school, a lower family income, and lower parental education were associated with lower parental rating of their child's experience in remote/hybrid schooling. This result illustrates how known inequities at the school level (Talbert-Johnson, 2004) translate to similar inequities when instruction pivots to online learning.

The shift to online learning did come with physical problems for many children. Almost two-thirds of participating parents reported that their child experienced physical problems after their child spent a day in remote school. While common ailments such as headaches and eyestrain occurred most frequently, back pain, which is unusual in school-aged children, was reported with some regularity. Computer screens have been shown to cause eye soreness and fatigue (Lee, Chiang, & Hsiao, 2021) and excessive use has been linked to headaches (Marques, Calmeiro, Loureiro, Frasquilho, & de Matos, 2015) and neck pain (Smith, Louw, Crous, & Grimmer-Somers, 2009) in middle and high school students. Remote schooling likely increased the risk for these problems among a wide number of students, but potentially more so for older students and children attending private schools. In the future, schools using remote schooling should invest in educational efforts toward improving the ergonomic home learning space.

Results of this study should be considered alongside important limitations. First, the sample is not representative of the US population of families with school-aged children. Although the sample is diverse and includes respondents from across the country, it was created through quota sampling through online panels and is limited in those regards. Additionally, the survey was conducted well into the pandemic; about a year following the initial school closures. Remote schooling and online social

connections likely evolved over the course of quarantine with later impacts potentially being more positive than earlier ones.

Overall, this survey shows a primarily positive experience with media used by families during the pandemic. Throughout this time, technology provided access to learning and social opportunities that many parents perceived as beneficial to their children. Furthermore, they saw the academic opportunities provided by remote learning as generally helpful. This was not necessarily true for everyone as parents of lower SES reported worse experiences. Additional research is needed to better understand the short- and long-term benefits and harms of such altered use of media and to determine what this unique experience can teach us as we seek to optimize the "new normal."

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