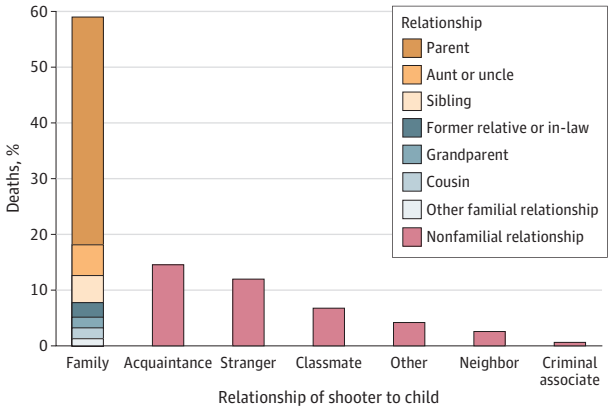
Figure. Relationship of Shooter to Child



Graph of the relationship between the shooter and pediatric victim in mass shootings from 2009 through 2020. Child is classified as a victim younger than 18 years. The consolidated category of family members includes the following relationships: aunt or uncle, cousin, former relative or in-law, grandparent, other familial relationship, parent, and sibling.

emerge to address firearm violence in our communities, our findings add to the growing body of literature[6] that suggests one of the most dangerous places for pediatric firearm injury may be within the home.

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ADOLESCENT MENTAL HEALTH

Adolescent Smartphone Use During School Hours

Screen use among US youth remains a concern, with adolescents aged 13 to 18 years spending 8.5 hours daily on average using screen-based media.[1] Smartphone use during school has become a concern, and school-based smartphone bans have been increasingly considered.[2] Smartphones may distract from classroom learning and opportunities for real-world interactions. However, it is unclear how adolescents are using smartphones during school. Emerging consensus is that measuring screen time alone is insufficient to appreciate its effects.[3,4] That is, what adolescents are viewing (content) and what activities are potentially being displaced (context/timing) may be salient factors for developmental outcomes.[3,4] To address this gap in the literature, this study used passive sensing to characterize the duration and content of smartphone use during school.

Supplemental content

Methods | *Participants and Procedures*. The research firm Ipsos recruited participants who met inclusion criteria (US residency, aged 13-18 years, English-speaking, and owning/being the primary user of a smartphone). Ipsos recruited panelists by contacting parents in a vetted panel and advertising to teenagers through social media or internet ads.

Members of racial and ethnic minority groups were oversampled, allowing for examination of sociodemographic differences in smartphone use. Of the 292 participants who installed RealityMeter (app measuring smartphone use) and had IP-verified US-based locations with complete sociodemographic information, 233 kept RealityMeter installed for 3 days or more. We constrained

the sample to participants with 2 or more weekdays of data during school-day hours of 8:00 AM to 2:30 PM during May and September through November 2023, excluding federal holidays, for an analytic sample of 117 participants.

On Android devices, RealityMeter measures foreground activity. On iOS devices, RealityMeter uses a VPN (virtual private network) that infers app usage and omits native apps. To address this, we used imputation from Android users to improve iOS estimates.

We followed the STROBE reporting guidelines.

Statistical Analyses. Smartphone use descriptives were weighted by population demographics to account for the sex, race and ethnicity, and age distributions of the sample. We used univariate linear regression analyses to examine whether sociodemographic characteristics were associated with school-day smartphone use. School-day social media use was somewhat positively skewed and leptokurtic and was winsorized at the 99th percentile in the analyses. All continuous variables in analyses and model residuals had skew less than 2 and kurtosis less than 7[5] (eMethods in Supplement 1).

Results | We found that adolescents spent an average of 1.5 hours (95% CI, 1.31-1.73) on smartphones during the 6.5 hours of school, accounting for approximately 27% of average 24-hour phone use of 5.59 hours daily. In this sample, 25% of adolescents spent more than 2 hours on their phone during school. By number of users, the top 5 most used apps or categories (excluding internet browsers) were messaging, Instagram, video streaming, audio, and email (**Table 1**) (eTable in Supplement 1). Univariate linear regression analyses are shown in **Table 2**.

Discussion | Using passive sensing on a sample of US adolescents, this study found half of adolescents use their smartphones during school for at least 66 minutes daily, primarily using messaging and social media. These findings extend a prior study limited to Android devices that found adolescents spent a median of 43 minutes on their phones during school.[6]

Since the study only focused on smartphone use, these numbers likely underestimated overall screen use. Due to lack of measurement of native iOS apps, the study underestimated iOS smartphone use.

Parents and adolescents may derive benefit from access to phones for communication and learning purposes during school. However, application usage data from this study suggest that most school-day smartphone use appears incongruous with that purpose. The analyses show high levels of social media use during school (the average Instagram user spent 25 minutes on Instagram per school day). These high-quality descriptive findings inform teachers, parents, and students about school-day smartphone use. Future studies should use larger sample sizes and deploy recruitment strategies reflecting broader segments of society.

Table 1. Descriptive Statistics of Study Sample (N = 117)

Characteristic	No. of participants[a]	Minimum	25th Percentile	Median	75th Percentile	Maximum	Participants, %[b]
Sociodemographic							
Age, mean (SD), y	117	14	16	17	17	18	16.36 (1.08)
Sex							
Female	57						48.7
Male	54						46.2
Other[c]	6						5.1
LGBTQIA+ status							
Not LGBTQIA+	69						59.0
LGBTQIA+[d]	48						41.0
Race and ethnicity							
Asian	26						22.2
Black	23						19.7
Hispanic or Latino	23						19.7
White	40						34.2
Multiracial	5						4.3
Parents with a bachelor's degree or higher							
None	41						35.0
≥1	76						65.0
Parental limits on screen use							
None	91						77.8
≥1	26						22.2

(continued)

Table 1. Descriptive Statistics of Study Sample (N = 117) (continued)

Characteristic	No. of participants[a]	Minimum	25th Percentile	Median	75th Percentile	Maximum	Participants, %[b]
Smartphone use	**No. of participants[a]**	**Minimum**	**25th Percentile**	**Median**	**75th Percentile**	**Maximum**	**Mean (95% CI)**
Smartphone use, h							
24-h Smartphone use	117	0.16	3.62	5.49	7.04	19.18	5.59 (5.06-6.12)
24-h Social media use	117	0.00	0.47	2.00	3.13	6.31	2.14 (1.84-2.45)
School-day smartphone use	117	0.04	0.68	1.11	2.16	5.84	1.52 (1.31-1.73)
School-day social media use	117	0.00	0.20	0.39	0.76	2.46	0.60 (0.49-0.71)
Smartphone application use during school day, min							
Messaging and chat	88	1.00	2.69	5.82	26.92	186.96	19.46 (13.39-25.53)
Instagram	82	1.18	8.64	13.32	26.42	269.42	24.61 (17.91-31.31)
TV, movie, or video streaming	68	1.22	4.02	7.86	21.67	132.49	17.19 (10.99-23.39)
Music, media, and podcasts	58	1.01	1.81	3.21	4.82	99.49	4.48 (2.79-6.17)
Email	53	1.02	1.33	2.74	5.21	15.63	3.92 (2.94-4.89)
TikTok	48	1.17	6.05	9.23	35.75	71.99	18.88 (13.23-24.54)
Shopping and entertainment	47	1.01	1.28	2.22	4.45	39.02	5.21 (3.01-7.41)
Games	44	1.01	3.11	9.68	18.88	100.29	13.43 (8.84-18.02)
Facebook	40	1.18	2.97	7.33	20.27	87.39	19.88 (11.05-28.71)
Utilities	39	1.03	1.30	2.38	5.51	21.40	4.27 (2.82-5.71)

Abbreviation: LGBTQIA+, lesbian, gay, bisexual, transgender, queer, intersex, asexual.

[a] Participants were only included if they provided 3 or more days overall and 2 or more school days of RealityMeter data. Smartphone use time values are weighted by participant sociodemographics based on population estimates from the US Census Bureau.

[b] Unless otherwise indicated.

[c] Includes nonbinary and any self-description that was not solely male or female.

[d] Includes nonheterosexual sexual orientation and/or other gender.

Table 2. Associations Between Sociodemographic Characteristics and School Time Spent on Smartphone[a]

Sociodemographic characteristic	School time, unstandardized *b*, h (95% CI)			
	Smartphone use	*P* value[b]	Social media smartphone use	*P* value[b]
Age, y				
13-15 [reference]				
16-18	0.55 (0.01 to 1.08)	.04	0.11 (−0.16 to 0.38)	.41
Sex				
Male [reference]				
Female	0.48 (0.03 to 0.93)	.04	0.28 (0.06 to 0.50)	.01
Other[c]	0.45 (−0.56 to 1.47)	.38	0.33 (−0.17 to 0.83)	.20
LGBTQIA+ status				
Not LGBTQIA+ [reference]				
LGBTQIA+[d]	0.22 (−0.23 to 0.66)	.34	0.19 (−0.03 to 0.41)	.10
Race and ethnicity				
Asian, non-Hispanic	−0.05 (−0.66 to 0.55)	.86	−0.18 (−0.46 to 0.10)	.21
Black, non-Hispanic	0.19 (−0.44 to 0.82)	.55	−0.11 (−0.39 to 0.18)	.47
Hispanic (any race)	0.25 (−0.38 to 0.88)	.44	0.41 (0.12 to 0.70)	.006
Multiracial	0.30 (−0.85 to 1.44)	.61	0.27 (0.17 to 1.22)	.01
White, non-Hispanic [reference]				
Parents/guardians with a bachelor's degree				
None [reference]				
≥1	−0.54 (−0.99 to −0.09)	.02	−0.43 (−0.65 to −0.21)	<.001
Parental limits on screen use				
No limits [reference]				
Any limit	0.01 (−0.52 to 0.54)	.97	−0.02 (−0.29 to 0.24)	.86

Abbreviation: LGBTQIA+, lesbian, gay, bisexual, transgender, queer, intersex, asexual.

[a] Analyses were univariate linear regression. Participants were only included if they provided 3 or more days overall and 2 or more school days of RealityMeter data.

[b] *P* values were 2-sided.

[c] Includes nonbinary and any self-description that was not solely male or female.

[d] Includes nonheterosexual sexual orientation and/or other gender.

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Correction: This article was corrected on March 3, 2025, to add a missing row to Table 1.

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COMMENT & RESPONSE

Policies and Regulations Regarding Adolescent Marijuana Use

To the Editor The study by Chan et al[1] provides an in-depth examination of the effects of cannabis use in adolescence and young adulthood on academic achievement. The study sheds clear and comprehensive light on an issue that is becoming increasingly prevalent globally and has important public health implications, particularly given the trend toward legalization of cannabis in some parts of the globe and the continued increase in overdose rates of psychotropic substances.[2,3] The results of the study provide valuable insights and fresh perspectives for policymakers and health practitioners to understand the long-term effects of cannabis use and its public health consequences.

There is a need for policymakers to synthesize the latest scientific evidence and relevant information and adjust relevant policies promptly to promote optimal social benefits and public well-being. The findings of this study[1] support the strengthening of warnings against cannabis sales and use, and thus require policymakers to adjust relevant regulatory strategies. This could be done, for example, by adjusting the age limit for purchase to reduce teenagers' access to marijuana.[4] The study found that there were significant differences in how different groups were affected by cannabis, with frequent and early users experiencing more severe academic problems. This suggests that policymakers need to pay more attention to these vulnerable and disadvantaged groups, especially the youth population, and tailor effective and feasible preventive and intervention measures.

Medical and health care workers need to actively improve medical management and monitoring systems to ensure the rational use and safe management of psychotropic drugs. Making full use of the electronic medical record system and drug monitoring software, when patients are found to have an abnormal increase in drug dosage or other abnormalities, health care professionals should intervene promptly to adjust the treatment program. Throughout the therapeutic process, attention should be paid to the assessment and intervention of patients' psychological problems and necessary targeted individual psychotherapy and psychological counseling services provided for different patients to help them cope with psychological stress and emotional problems.

Finally, we should be aware of the limitations of this study,[1] which suggests the need for further in-depth research and interdisciplinary cooperation to jointly promote the progress of this important topic, to gain a more comprehensive understanding of the complex relationship between marijuana use and academic performance, and to