2023

Constant Companion:

A Week in the Life of a Young Person's Smartphone Use

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A Letter from Our Founder

Smartphones have become a constant companion in our teens' lives. From connection with family and friends to entertainment and background noise, young people rely on their smartphones for different types of mental health support, relaxation, and distraction—at home and at school, and during the day and night.

This year, Common Sense has focused our research efforts on hearing directly from young people about both the role and the impact of media and technology in their lives. This report fills a gap in our understanding of how teens actually use their smartphones, combining data from kids' phones themselves with feedback from our Youth Advisory Council. And they told us that the draw of their smartphone is both complicated and powerful. Here's what else we learned from this report:

- **Teens are fielding a barrage of notifications from the apps on their phones**. On a typical day, participants received a median of 237 notifications. Of those, about a quarter arrived during the school day, and 5% at night.

- **School phone use is common, and policies are inconsistent**. During school hours almost all of the participants used their phones at least once, for a median of 43 minutes. But they also reported that policies about phone use in schools vary—sometimes even from classroom to classroom—and aren't always enforced.

- **Smartphones both help and hurt sleep**. Over half of participants used their phones on school nights, often to listen to music to wind down or get to sleep. But sometimes their days are so busy that they only get to relax with their phone at bedtime, and that pushes sleep later.

The good news is, many young people reported they have grown savvier about their phone's attempts to draw them in, and they're taking steps to protect their digital well-being, like setting time limits and prioritizing certain types of notifications. But the business model of these apps and devices hinges upon young people picking up their phones and engaging with them as much as possible, and it's clear that teens are struggling to set boundaries.

Research like this helps shed light on what young people are really doing on their phones, and allows families, educators, and leaders to better understand where and when to provide support. But the industry can take steps to recognize that young people need to be able to use their phones for all of their important benefits but without the challenges that negative content, persuasive design, and aggressive business models pose to digital well-being.

At Common Sense, we will continue to provide parents, caregivers, educators, industry leaders, and policymakers with the tools, resources, research, and information they need to help kids build healthier relationships with the technology in their lives. And it's our hope that this research allows for continued focus on youth voices in our mission to make the digital world work better for kids everywhere.

James P. Steyer,
Founder and CEO

Credits

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Introduction

Smartphones entered the lives of children and adolescents in 2007. Compared to earlier devices (flip phones), smartphones allowed more than just texting and taking photos. Young people could now browse the internet, choose from thousands of mobile applications ("apps") and games, and connect immediately with their communities through social platforms—from anywhere.

As internet speeds and computing power increased exponentially over the past 15 years, smartphones have become even more powerful and versatile, allowing livestreaming, multiplayer gaming, and creation and distribution of content. Over a relatively short period of time, these handheld computers have become a disruptive force in the lives of young people, in positive and negative ways that adults who grew up with landlines may not fully grasp.

Getting a smartphone is now a rite of passage for most children and adolescents in the United States. According to Common Sense Research, 43% of tweens (age 8 to 12) and 88% to 95% of teens (age 13 to 18) have their own smartphone (Rideout et al., 2022; Pew 2022). About half of U.S. children get their first smartphone by age 11 (Rideout et al., 2022). Young people describe a range of supportive and stressful experiences with their smartphones—some wish they hadn't gotten one so early, while also describing it as an appendage that they cannot live without (Moreno et al., 2019). The decision of when to get a smartphone, and negotiations about rules and boundaries around smartphone use, are frequent sources of parental stress and family arguments (Mathes et al., 2021; Francis et al., 2021; Hiniker, Schoenebeck, & Kientz, 2016).

Several factors contribute to young people's attachment to their phones. First, it is developmentally appropriate for adolescents to seek connection and feedback from their friends and communities, and to want to do so on a frequent basis. Children and adolescents have developmentally adaptive curiosity about information, culture, entertainment, and stories that help them make sense of their world.

However, the *design* and *marketing* choices made by technology companies to meet their business objectives also make it challenging for young users to separate from their smartphones. More time spent on mobile apps translates to more advertising revenue and in-app purchases, so many apps contain persuasive design features to encourage prolonged engagement (Radesky et al., 2022; 5 Rights Foundation, 2021). These design features include encouragement of content creation (so there is always more content to recommend to users), reduction of friction (e.g., the swipe-up movement that allows a user to easily move on to another video), time pressure (e.g., notifications urging users to watch a livestream before it stops), quantified reinforcers (e.g., likes, shares, virtual currency), or algorithmic recommendations that analyze a user's digital behavior to predict what they might click on next.

Underlying these design features are marketing incentives to keep young people on their phones—and ideally win their brand alliance. Smartphones are an unprecedented marketing vehicle because they are taken everywhere and provide insight into users' daily behavior, preferences, and social networks. The data traces recorded by smartphones (such as location, purchases, likes, and shares) allow businesses to create user profiles, which can then be sold or used to earn revenue through targeted advertising.

Considering the competing interests of 1) a business model that prioritizes engagement and 2) a developing adolescent human user with various passions, drives, and obligations, it is not surprising that both young people and their parents complain of feeling like they spend more time on their phones than they intend (Pew 2022; James & Weinstein, 2022).

Smartphones are nearly ubiquitous in the life of U.S. adolescents, but research on how they are used has been elusive. This research typically relies on self-reporting of daily usage habits, momentary reports (e.g., pinging participants throughout their day to assess moment-to-moment changes in media use), or asking young users what they experience through their phones (e.g., social support or bullying; toxic or inspirational content). However, if we want to interrogate the role of

smartphones—and all of their complex uses in the daily lives of young people, from communication to entertainment, creativity, marketing, and productivity—then we need research methods that *measure the behavior of phones*. This is possible through the harnessing of data that is already collected by technology companies and marketing firms to monitor smartphone users, but that is not *typically* shared with researchers on an individual-user basis.

For this study, we used software to collect data from the smartphones of a diverse sample of about 200 11- to 17-year-olds. We then interpreted this data with assistance from an advisory council of young people to understand the nuanced relationships that young people develop with their smartphones.

Our research aimed to address the following questions:

- How much time are preadolescents and adolescents spending on their smartphones?

- Which types of apps do they use most frequently and for the longest periods of time, and why?

- Are they accessing apps intended for older audiences?

- How many notifications are they receiving per day, and from which apps?

- How much smartphone use occurs during school hours, and why?

- How much smartphone use occurs at night, and why?

- How much tension or frustration are preadolescents and adolescents experiencing about their smartphones, and how do they manage this?

- Are there new insights about youth experiences and practices with smartphones that could lead to better design to improve young people's well-being?

To that end, we enrolled 203 11- to 17-year-olds in the United States to let us track their smartphone use for one week by installing Chronicle, a study app (Radesky et al., 2020). This app runs unobtrusively in the background and provides continuous data about which apps were used and when, how many pickups and notifications occurred, and how much smartphones were used during the school day and overnight hours. The study was conducted with Android phone users only, because Apple device tracking does not share with the research community the names of specific non-Apple apps that young people commonly use (e.g., social media apps, mobile games).

After analyzing results, we reviewed them with 15 members of the 2023 Common Sense Youth Advisory Council, a group of 14- to 18-year-olds of various races/ethnicities and genders who live in communities across the United States. These youth advisors worked with Common Sense from January to May 2023, but their phones were *not* tracked as part of the study. Through these conversations, we gained insights into the push and pull that adolescents feel with their phones, with the ultimate goal of imagining how smartphones could be designed to support the agency of younger users.

Along with our main findings, this report includes relevant and actionable takeaways for parents and policymakers, as well as discussion prompts for talking with kids about their sometimes complicated relationships with smartphones.

Key Findings

The key findings in this report combine granular data about young people's smartphone use with teens' own interpretation of the role that these devices play in their lives. This unique perspective gives us a glimpse into teens' relationships with their devices, including the attraction that smartphones and apps hold for teens, the corresponding pressures, and the strategies they use (whether barriers, rules, or friction) to manage smartphone use in their day-to-day experiences.
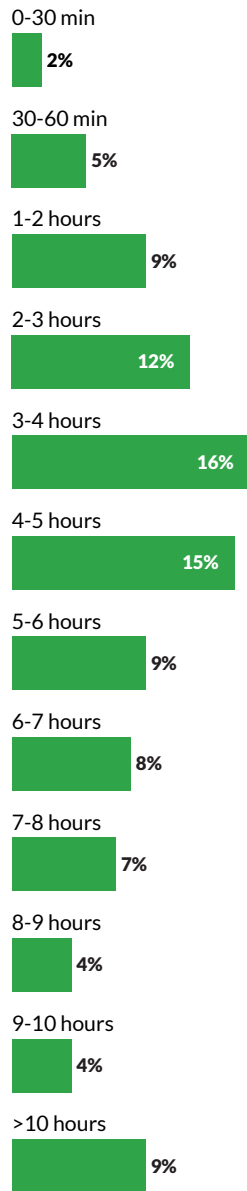
1. The smartphone is a constant companion, both providing background buzz and encouraging regular pickups over the more than four hours of teen smartphone use on an average day.

Smartphones are integrated into young people's lives in ways that help them connect with friends, give their brain a rest, or help them laugh and calm down during their busy days. On a typical day, the participants in our study used their smartphones for a median of almost four and a half hours. However, simply showing average daily smartphone duration across our sample doesn't tell the whole story. Some participants used their phones for only a few minutes per day, while others averaged over 16 hours a day (Figure 1).

Adolescents' smartphone use doesn't always match adults' narrative of "teens always staring at their screens." In addition to more active use, some teens in our focus groups talked about how they also use their smartphones to provide a background "buzz" by playing movies, videos, or music while they do homework or laundry.

And for most of the teens in our sample, their smartphones were close at hand and picked up and checked frequently throughout the day—a median of 51 times per day, ranging from two to 498 times per day. Younger participants (11- to 12-year-olds) tended to pick up their phones less frequently each day, while adolescents (age 13 and older) were more likely to check their phone over 100 times per day (Figure 2). Teens in our focus groups told us that younger smartphone users usually have more rules or restrictions placed on their use, while older teens are given more independence as they learn the appropriate time and place to use their phone. Younger teens may be less likely to have peers with smartphones, and fewer friends to contact.

FIGURE 1. Distribution of average daily duration of smartphone use

0-30 min
2%

30-60 min
5%

1-2 hours
9%

2-3 hours
12%

3-4 hours
16%

4-5 hours
15%

5-6 hours
9%

6-7 hours
8%

7-8 hours
7%

8-9 hours
4%

9-10 hours
4%

>10 hours
9%

FIGURE 2. Average daily smartphone pickups, by participant age

0–25
28%
25%
16%

26–50
36%
15%
12%

51–100
29%
27%
28%

101–150
5%
16%
24%

151–200
0%
8%
20%

>200
2%
8%
0%

- 11–12
- 13–15
- 16–17
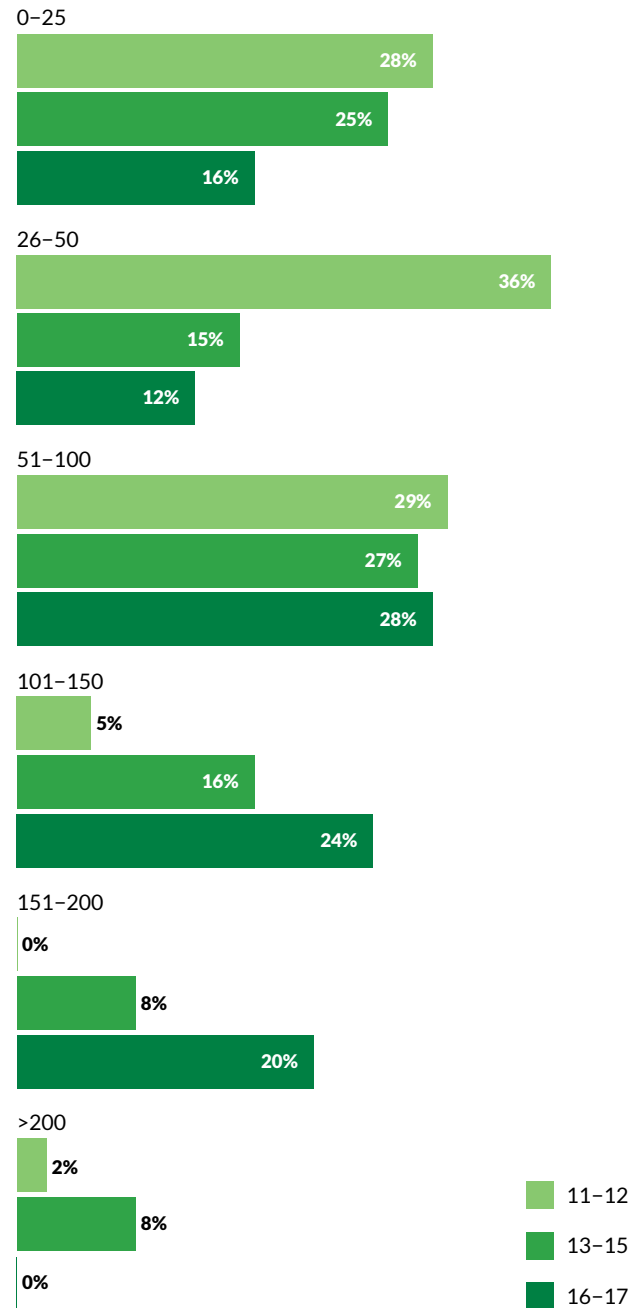
2. Phone use during school hours is nearly universal but varies widely, reflecting a patchwork of different school policies.

Smartphone use at schools is fairly widespread, and it varies based on school rules, teacher and staff enforcement, and student compliance. During school hours (Monday through Friday, 8 a.m. to 3 p.m., excluding holidays), 97% of participants used their phones, for a median of 43 minutes (ranging from less than one minute to six and a half hours). The median number of pickups was 13 per school day, ranging from less than one to 229. The app categories that took up the highest proportion of time during school hours were social media (32% of smartphone use during school hours), gaming (17%), and YouTube (26%), among participants who used those app categories (Figure 3).

Youth advisors told us that schools have a wide variety of policies, and variable enforcement within those policies, which students may or may not follow:

> **For my school, we do have a phone policy and we're not technically allowed to have it out during class, but a lot of people do in spite of that. And definitely, I think if you track kids at my school, their phone usage, you would definitely see them checking their phones, and then checking Snapchat during class.**
> **—10th grader**

> **It's kind of up to teacher discretion. So at the beginning of the year, they said it's not allowed, but it's really up to each teacher whether they allow it in the room or not. A lot of them do.**
> **—11th grader**

FIGURE 3. Median* duration of use of different smartphone app categories during school hours**
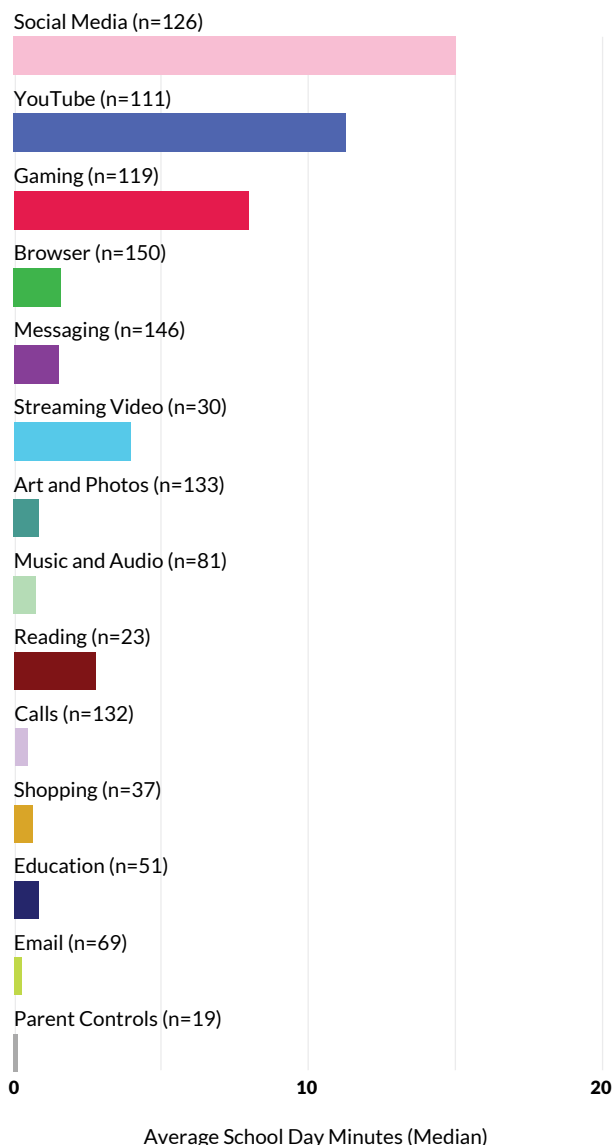
Average School Day Minutes (Median)

*Median is the value that 50% of the users are under and 50% are over.
**Includes only participants who used that category of apps during specified time frame.

3. Notifications are plentiful, with half of our participants receiving 237 or more per day. These interruptions are both delightful and distracting, leading many young users to feel the need to manage what they get notified of, and when.

While phone pickups signify how often a user is engaging with their phone, notifications show us how often a phone tries to engage its user. On a typical day, participants received a median of 237 notifications. Of the notifications delivered to their phone, participants saw or engaged with about a quarter (median 46 per day). Notification frequency varied widely, with maximums of over 4,500 delivered and over 1,200 seen (Figures 4 and 5).

About a quarter (23%) of notifications arrived during school hours, and about 5% during school night hours, suggesting that phones and apps could do a better job of eliminating unnecessary notifications at times of day that are more disruptive to young people. Very few participants received *no notifications* at all during school hours or school night hours.

Because notifications are so numerous and occur day and night, they require management by young users. Our youth advisors described different approaches to managing these interruptions. They said it was essential to filter or block notifications, particularly from "spam" content, favoring notifications of direct messages (DMs) from people.

Snapchat and Discord ranked highest in the number of notifications sent to participants in a typical day, with some participants receiving hundreds of messages from these platforms. But our youth council members noted that they've become savvy to the ways in which some apps try to pull them in with frivolous notifications.

> Yeah, for me, I have notifications on for the apps that are messaging apps, but then for the other ones, I don't have notifications on for YouTube or Instagram ... For me, I don't like the notifications that just tell you to go back on the app or just something random like that, like an update or something. I don't really care about those ones. But the ones I do like getting are the ones that are from the messaging apps, like if someone sends me a text, I wanna know what it says.
> —10th grader

FIGURE 4. Average daily notifications received by smartphones

Range	Percent
0-100	20%
101-200	20%
201-300	23%
301-400	9%
401-500	9%
>500	20%
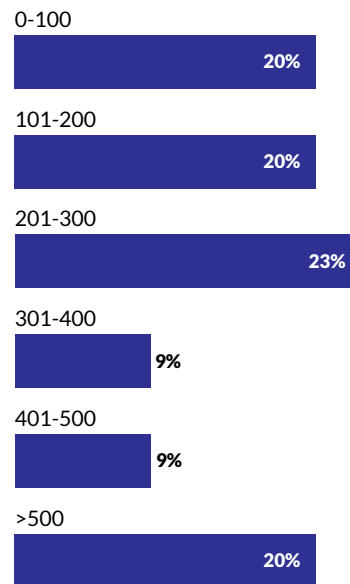
FIGURE 5. Average daily notifications seen by the user

Range	Percent
0-25	28%
26-50	24%
51-100	21%
101-150	12%
151-200	7%
>200	8%
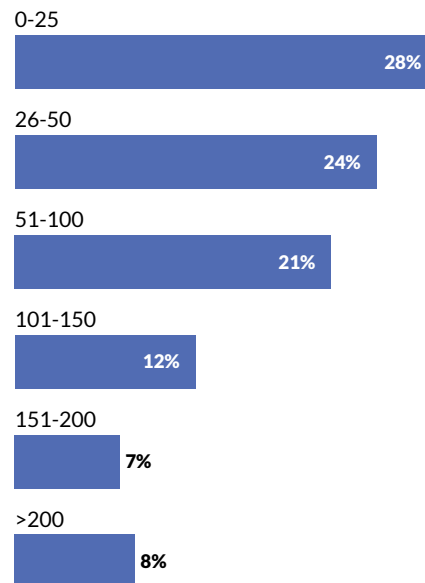
4. TikTok is irresistible, offering bite-size pleasure and low-friction interaction that quickly adapts to the user's interests or mood.

TikTok was one of the most popular and longest-duration apps used in the sample of 11- to 17-year-olds whose phones we tracked. TikTok was used by 50% of our participants, for a median of one hour and 52 minutes per day. Compared to other social media apps, TikTok users were more likely to spend several hours per day using it (upwards of seven hours a day), often during school hours and overnight. In contrast, the longest amount of time spent on Snapchat and Instagram was around three hours per day.

Youth advisors explained to us that TikTok provides an experience that other social or video-sharing platforms don't. TikTok was described as "easy" because videos simply start to play—the user doesn't have to make any decisions, so there's no friction. Adolescents we talked to said that the TikTok algorithm "knows" them so well, they can expect that they will likely find something fun to watch. If the user isn't interested in the video that starts to play, the app quickly adapts to something more engaging or that fits their mood or desires. Finally, the videos are short, so they provide small doses of pleasure when young people need a break but don't have a lot of time.

> Then TikTok, I honestly feel just because it's so easy to feel, 'Oh, I only have 10 minutes. Let me get onto TikTok right now 'cause I don't really have time for anything else.' Because it provides kind of instant entertainment, you don't really have to go in, like on YouTube you have to go in, you have to search for something, you have to find a video that you wanna watch. And on TikTok it's really just there. You can open it kind of whenever you want. And even on a short amount of time, you can still watch at least two or three videos.
> —11th grader

> I also think the TikTok algorithm is just way better than any of the others. Even Instagram reels and then YouTube Shorts is like the same thing as TikTok, but the algorithm for TikTok is just way more addicting, I feel like [it]... draws you in more, and it also adapts really quickly. So if I skip a few of the same type of video, it'll stop playing that pretty quickly ... I think it just happens naturally. You just scroll without really looking at a certain type of video a few times and then you'll see it adapts and gives you some other type.
> —11th grader

5. Over half of teens used their phones overnight on school nights, primarily for social media, gaming, or YouTube.

We defined school night usage as any use Monday through Friday during the hours of midnight to 5 a.m. (excluding holidays). Over half of participants (59%) used their phones on school nights, with a median of about 20 minutes per night, although use ranged from less than a minute to five hours. Similarly, 67% of participants had pickups on school nights, with a median of one per night, though at least one participant picked up their phone 18 times on a typical school night.

App categories that took up the highest proportion of school night use included YouTube (47% of smartphone usage on school nights), social media (39%), gaming (29%), and reading (18%), among participants who used those app categories. YouTube appeared to be the longest-running app due to several participants running it overnight, likely with music or white noise playing. TikTok was also commonly used in the overnight hours on school nights, but youth advisors reported that TikTok can be overstimulating and lead to difficulties in falling asleep.

> I might say that for certain apps, like TikTok, it's really hard to fall asleep once you use it close to when you're gonna go to sleep. I can't use it within an hour, or else I'd struggle ... and then I'll just get back on the app 'cause I'm not sleeping anyway.
> **—10th grader**

FIGURE 6. Median* duration of use of different smartphone app categories during school nights**
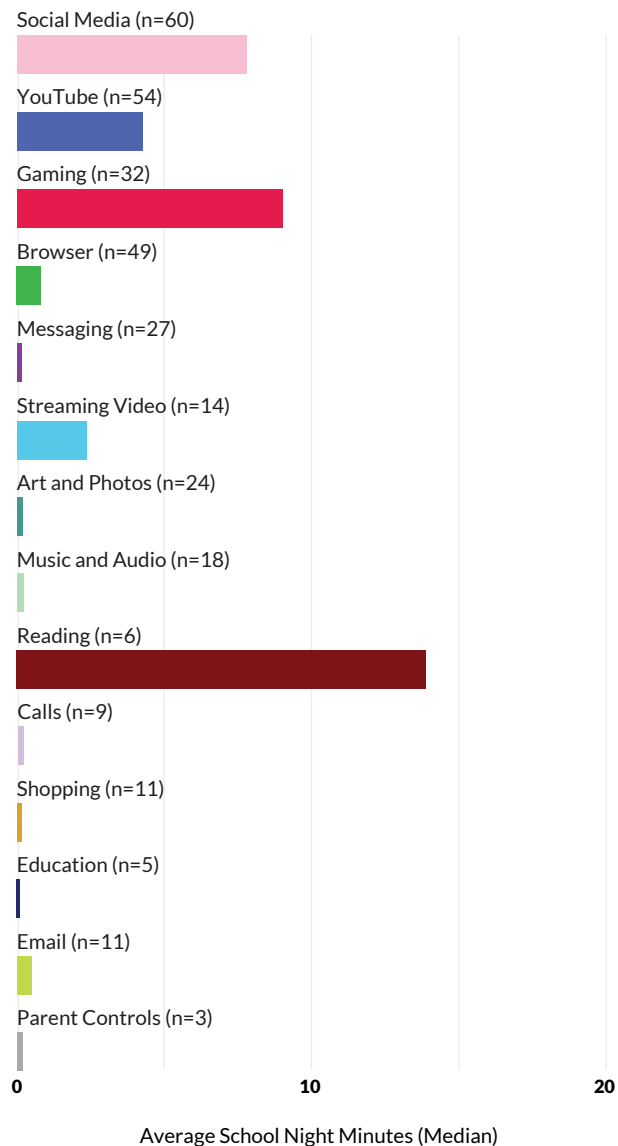
Average School Night Minutes (Median)

*Median is the value that 50% of the users are under and 50% are over.
**Includes only participants who used that category of apps during specified time frame.

6. Smartphones can allow access to age-inappropriate experiences, including social media for kids under 13 and apps with mature/adult-only ratings.

Of 85 participants who were under age 13, 68% used social media apps, and they all used at least one app rated "Teen" or higher. The most popular social platforms among 11- to 12-year-olds were TikTok (used by 47%), Snapchat (31%), Discord (25%), Instagram (16%), Facebook (16%), and Pinterest (14%).

In addition, almost half (45%) of our participants used apps with mature (17+) or adult only (18+) ratings, such as Pornhub, fantasy sports/betting apps (Yahoo Fantasy Sports & Daily Sleeper Fantasy Football), Telegram, Reddit, Parler, 4chan, casino games, or violent games such as Call of Duty.

A small number (14) of participants used social media apps with risky features, like being able to connect with strangers for messaging, sending photos, or video chat. Although these riskier social media apps did not take up as much time as more mainstream social media apps, even brief use might lead to problematic interactions with adults.

7. Young users admit they have challenges managing their technology use, but through steps like curation and adding friction, they're working on it.

In addition to tracking their phones, we surveyed our 203 participants to ask whether they had any problems managing their technology use. Over two-thirds of these 11- to 17-year-olds said they "sometimes" or "often" find it difficult to stop using technology, use technology to escape from sorrow or get relief from negative feelings, and miss sleep due to being on their phone or the internet late at night. These impacts may be due to the natural pull that adolescents feel toward their social contacts through their phone, but the engagement-prolonging design of apps and platforms also likely contributes.

Interestingly, our youth advisors described ways of adding friction to their phones to try to use them more intentionally:

> **For me, even throughout the day, I keep 'do not disturb' on, not even because I wanna not respond to people or anything like that. I like being able to not have my phone buzzing, but being able to click on ... I don't know if I can show you guys, but like here, you see this. Like you have to click on that to see all of the notifications that people have sent or everything that ... All the notifications that you would have gotten if you weren't on 'do not disturb.' For me, I like the extra step because then it's like me having to do more work to be on my phone, and I don't know, I feel like it's a little strategy for me.**
> **—11th grader**

Methodology

Study design

A diverse sample of 203 U.S. preadolescents (ages 11 to 12) and adolescents (ages 13 to 17) with their own smartphones were recruited by Horowitz Research between August and November 2022 (see Table 1). Parents and caregivers of tweens and teens were contacted with brief information about the study, and if interested, provided informed consent for the child and shared the child's email address. Children were then contacted by email and provided online informed consent before completing a baseline questionnaire and installing the Chronicle app (Methodic, Inc) onto their smartphone. Eligibility criteria included: 1) ages 11 through 17; 2) speaks English or Spanish fluently enough to complete informed consent and surveys; 3) has their own Android (version 6.0 or above) smartphone (e.g., Samsung, Google Pixel, Motorola, etc). iPhone users were not included because data collection access for detailed app usage (i.e., names of specific apps such as YouTube, Snapchat, etc.) was not available for researchers at the time of data collection. The study was approved by the University of Michigan IRB.

Baseline surveys

Parents reported their educational attainment, household income, and their child's race/ethnicity. Child participants completed a brief online survey that included the Technology Impairment Scale (six items, alpha = 0.76, Burnell & Odgers, 2023, adapted from Meerkerk et al., 2009) which assesses compulsive technology use or interference with daily activities (e.g., *Do you feel restless, frustrated, or irritated when you cannot access the internet or check your mobile phone? Do you use technology to escape from your sorrow or get relief from negative feelings?*) on a response scale of 0 = never, 1 = sometimes, 2 = often.

Mobile device tracking

Participants were instructed on how to install and set up the Chronicle app and keep it running on their device for nine complete days. This app was developed with NIH funding, pilot-tested and validated against pen-and-paper logs of smartphone use, and has been used in child and parent populations (Radesky et al., 2020). After nine days, participants were contacted and prompted to uninstall Chronicle and data

were exported from the Methodic Chronicle dashboard. Chronicle provides timestamped data about which app is running in the foreground and when pickups and notifications occur, but does not collect information about contacts, message content, which websites are visited, or what content is viewed on platforms. In the informed consent form, participants were provided clear explanations of what data would be collected, how it would be used, and how soon it would be deleted.

Data cleaning and inspection processes were used to identify any missing gaps in smartphone data (e.g., no data for >12 hours) and reduce the duration of apps that sometimes run long but are not true usage (e.g., launcher, screen saver, alarm clock). Some participants' data crossed two time zones, indicating that they traveled during data collection, so we removed the time zones that occurred on fewer days before analyzing time-stamped data. We visually inspected all overnight data to ensure that it showed data characteristics of true usage (i.e., rather than data irregularities that occasionally occur). Chronicle data was then processed to calculate hourly and daily duration, pickups, and notifications, as well as duration and notifications for popular apps and app categories. Notification and pickup data were not available for four participants with older versions of the Android operating system. Data for each participant were also visualized using R.

App categorization

We pulled data from the Google Play store API corresponding to each app package name, including the app category (e.g., gaming, photography, shopping, social) and content rating (e.g., Everyone, Teen, 17+, 18+/Adult). Apps that could not be found on the Play store were manually categorized. We collapsed or expanded some categories to reflect the main types of apps used by 11- to 17-year-olds. For example, "communication" apps were recategorized into more precise categories that reflect different uses, such as calls, email, or chat/messaging. We categorized any app as Social Media if it involved a non-SMS platform that facilitated the exchange of text, video, and photo content with interaction by users (e.g., Snapchat). However, we separated YouTube into its own category (including YouTube, YouTube Kids, and YouTube TV) because of the unique usage patterns YouTube has shown in our prior work (e.g., Radesky et al., 2020).

Data analysis

We conducted descriptive analyses of the average daily duration of use, number of pickups (defined as the number of times the screen turned on due to a user action), and number of notifications. Notification data from the Chronicle app included both notifications delivered to the smartphone (regardless of whether the notification was audible or silenced, as Chronicle does not collect that information) as well as notifications seen by the user (indicating that the notification was interacted with by the user or appeared when the user had the phone screen on). Notifications are delivered by a wide range of apps, from utilities to texting apps, so duration and notification data were also analyzed for particular app categories and individual apps popular within the sample (e.g., TikTok). If a participant did not use their phone on a given day, that day was excluded from analyses, so that the estimates reflected what tweens and teens did during typical days of use. We also segmented estimates of duration and pickups into school hours (Monday through Friday, 8 a.m. to 14:59 p.m., excluding summer/holidays), or school overnight (Monday through Friday, 12 a.m. to 4:59 a.m., excluding summer/holidays) period. We calculated the number/percentage of participants who used app categories, specific common social media apps and video games, and whether participants endorsed positive or negative online experiences or different technology impairment symptoms.

We used Chi Square and Kruskal Wallis bivariate tests to study associations between smartphone usage variables and age range (11 to 12, 13 to 15, and 16 to 17).

Post-analysis youth focus groups

Fifteen members of the 2023 Common Sense Youth Advisory Council participated in four separate online focus groups with the goal of helping the research team interpret and contextualize findings from smartphone data. Parents or guardians of Youth Advisory Council members had provided consent for their children to participate, and members provided verbal consent for audiotaping of Zoom focus groups, which were then transcribed. First and last authors then reviewed themes that arose from these groups and selected quotes for the current report that aided with interpretation of findings from a youth point of view.

TABLE 1. Participant characteristics

| Characteristic	N	%
Age category		
11 to 12	85	41.9%
13 to 15	93	45.8%
16 to 17	25	12.3%
Gender		
Female	89	43.8%
Male	112	55.2%
Nonbinary	1	0.5%
Other/prefer not to answer	1	0.5%
Race/Ethnicity		
Asian/Native Hawaiian/Pacific Islander	20	9.9%
Black or African American	39	19.2%
Hispanic/Latino/a/x/e	44	21.7%
Some other race	9	4.4%
White	91	44.8%
Household annual income category		
<$50,000	71	35.5%
$50,000 to $99,999	77	38.5%
$100,000 or more	52	26.0%
Respondent parent education		
High school/technical school or less	31	15.4%
Some college	55	27.2%
College degree	73	36.1%
More than a college degree	43	21.3%
Children in household (including participant)		
1	67	33.0%
2	67	33.0%
3	41	20.2%
4 or more	28	13.8%
Respondent parent marital status		
Married or living with a partner	146	71.9%
Separated or divorced	21	10.3%
Single	33	16.3%
Widowed	3	1.5%

How much time were preadolescents and adolescents spending with their smartphones?

Time spent with smartphones, or any digital media for that matter, can mean a variety of things. One hour of smartphone use might mean an hour laughing with friends, messaging about homework, consuming influencer content on social platforms, responding to harassing comments, or getting lost in a video game. Time spent with a smartphone might find an adolescent user fully engaged, or might reflect apps running in the background while the user multitasks. Therefore, these results regarding smartphone time are the most basic measure of a young person's relationship with their phone; however, they hint at how pervasively a phone occupies a teen's time on a typical day.

When averaged across all days their smartphones were tracked, participants used their phones for a median of about four and a half hours per day, but there was a wide range of usage among different teens as shown by the duration categories in Figure 1. At the high end, almost 10% of participants used their smartphones for 10 or more hours per day on average.

Hour-by-hour averages of smartphone use are shown in Figure 7. Across all 203 participants, it is clear that the peak of usage occurs in the afternoon and evening hours. Our youth advisors stated that their smartphone is often by their side after school, while doing homework, or when trying to wind down before bed. Compared to younger participants, more older teens (16- to 17-year-olds) used their phone in the overnight hours.

FIGURE 7. Hour-by-hour plots (from midnight to midnight) of average smartphone use* in minutes, split by age group
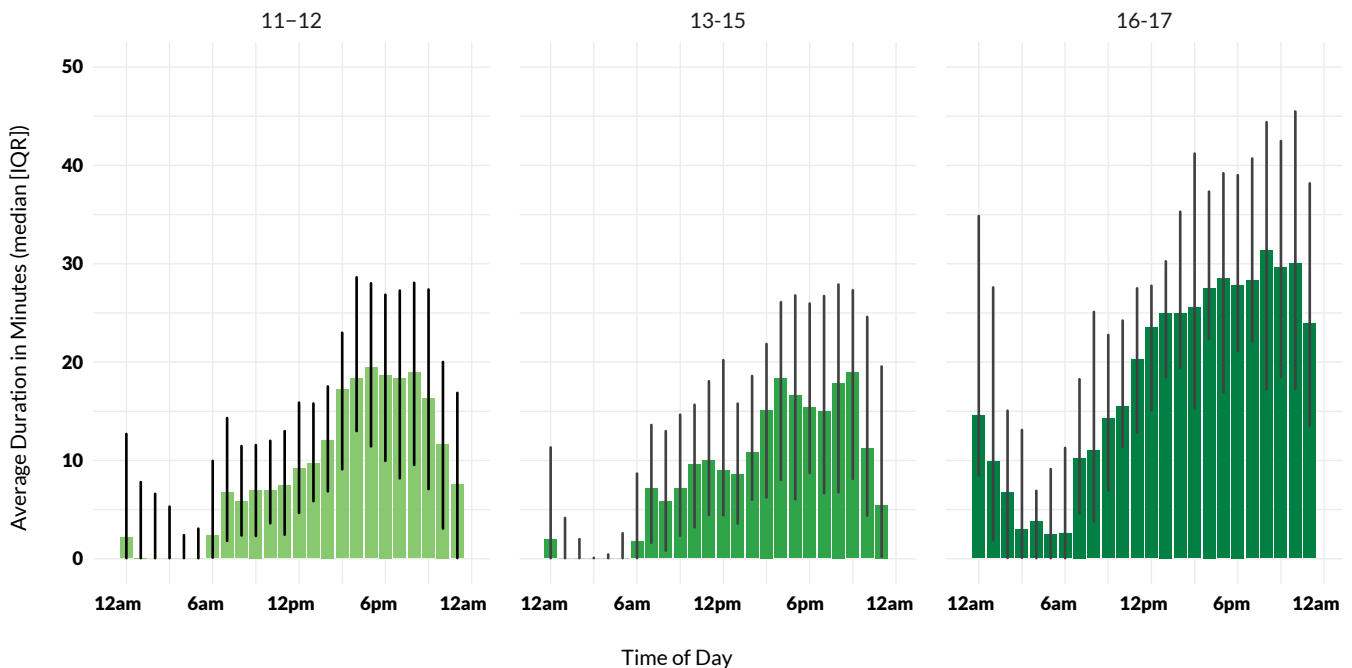
*Median is the value that 50% of the users are under and 50% are over. IQR is the Interquartile Range, which is the middle 50% of users, with 25% of users under the first value and 25% of users over the second value. Bar shows the median value; line shows IQR.

Participants picked up their phones a median of 51 times per day, ranging from two to 498 times per day. When pickups were graphed hour by hour (Figure 8), it was apparent that teens (age 13 to 17) check their phone regularly through the middle of the day (i.e., during school hours) as well as after school. Younger participants (age 11 to 12) had the lowest frequency of pickups per hour. Our youth advisors thought this was probably due to younger smartphone owners having more phone restrictions and rules placed by their caregivers as well as smaller social networks to keep in touch with.

Time spent on smartphones varies widely.

Youth advisors were also intrigued by the extreme ends of smartphone usage found in our study sample. While most agreed that five hours per day seemed like the amount of time most of their peers spend on their phone, they were surprised that some 11- to 17-year-olds would use phones for only a few minutes per day, or up to 16 hours/day. The daily usage patterns of five participants with the lowest-duration usage, and five with the most pervasive usage, are shown in Figures 9 and 10.

When talking about how much time their phone use takes up in a day, most youth advisors felt that their phone integrates into their daily experience in a non-burdensome way, and provides small amounts of pleasure or social connection while they do other things.

> **When I'm doing work, I like putting my phone to the side, and whenever I give myself breaks, I'll go to my phone and check notifications.**
> **—11th grader**

However, they also expressed that managing their smartphone takes work, and being without their phone can be freeing:

> **I feel like we'd all feel a lot better if we were on it less. Like, when I lost my phone ... I didn't have a phone for a week, and that week was amazing. Although I couldn't... I had to use my friends' phones to contact people if I needed to text them. Just not having a phone, it takes this weight off of you. It almost sets you free in a way.**
> **—11th grader**

FIGURE 8. Hour-by-hour plots (from midnight to midnight) of average smartphone pickups*, split by age group
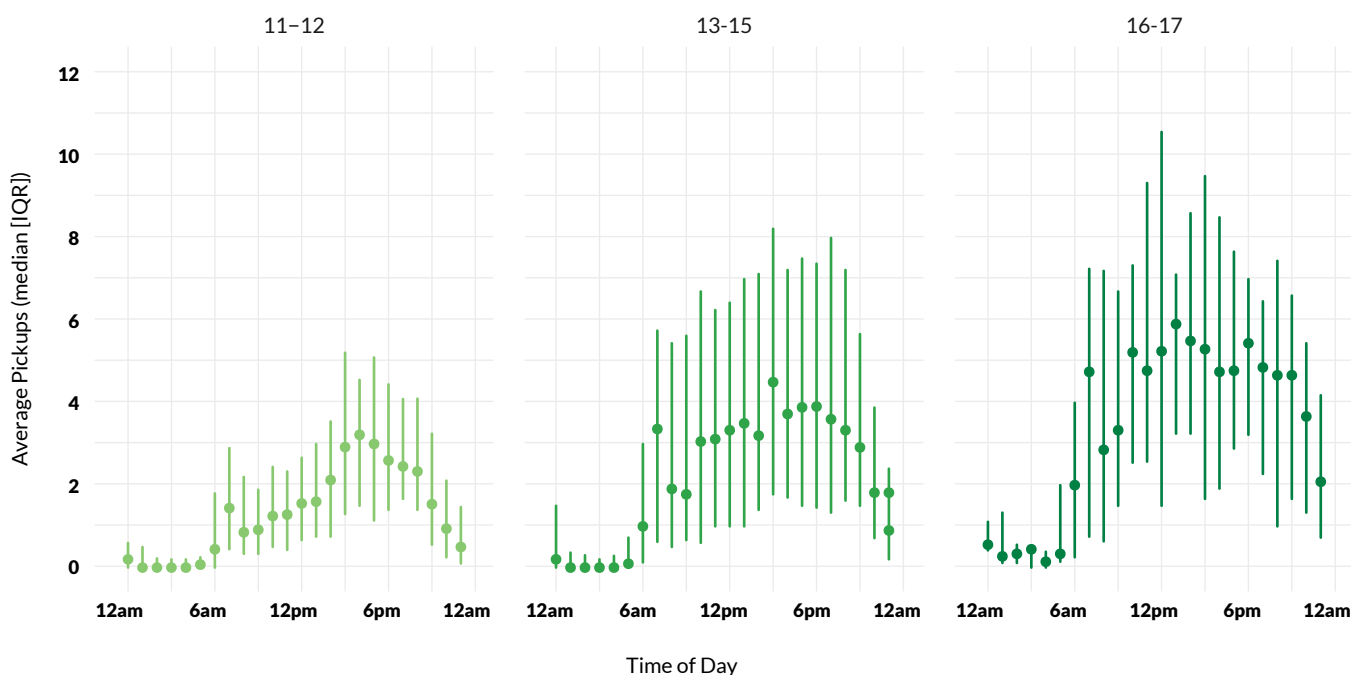
*Median is the value that 50% of the users are under and 50% are over. IQR is the Interquartile Range, which is the middle 50% of users, with 25% of users under the first value and 25% of users over the second value. Dot shows the median value; line shows IQR.

The adolescents we talked to also reflected on the fact that, when looking at phone usage visualizations, it seemed that each participant had their own "style" of use—their "thing" that they tended to do more than any other activity on their phone, such as social media (shown as pink shading; Figure 11), mobile games (red shading; Figure 12), or YouTube (royal blue shading; Figure 13).

> It seems like everybody has their own thing that they're obsessed with. Like this person has reading, versus another person has some sort of YouTube. And it's different for each person, but everybody seems to be using one thing as a means to stay connected or to spend time.
> —12th grader

Not all smartphone use is active; some is background noise.

Youth advisors emphasized that it's important not to assume that all usage appearing on participants' day-to-day visualizations was active smartphone usage. They described use of phones as "background noise"—for example, streaming movies or videos or music—while doing other activities. This ambient use of smartphones in the background was described as having a "stimulation" or calming purpose, in contrast to engaged usage, such as texting with a friend, that "you can't just blur out" into the background.

> Like I see kids in school literally just have TikTok on autoplay while they're doing work, like it's sitting on their desk, but they're not even looking at it. It's just like to have some sort of stimulation in their brain, I guess, while they're doing something.
> —10th grader

> I know a lot of people who work with Netflix playing. They'll just have it playing either on their phone or on their computer, or they'll sleep to it.
> —11th grader

> I definitely do that. Like if I'm doing laundry, if I'm doing homework, I'll just have something so that my room isn't quiet. I kind of enjoy that buzz.
> —12th grader

TAKEAWAYS

For most adolescents, smartphones take up a large proportion of their waking hours. Whether this feels like time well spent depends upon what they're experiencing, what the smartphone is augmenting vs. interrupting, and the other positive activities the person had access to that day.

It's important to remember that smartphones are going to be in both the background and the foreground of kids' minds.

Young people's phone use patterns vary significantly from each other, and the unique way that smartphones interweave into a young person's day feels personal. Many kids have a signature or pattern to their phone use, their main "thing" that they love doing (or feel obsessed with) on their phone, so it's worth helping them reflect on how their particular personality influences their relationship with their phone.

TALKING POINTS

Adults can ask:

- What is your favorite app? Do you feel stressed or excited by it? Or both?

- Does it feel like a job or "work" to stay up to date on everything?

- What does it feel like when your phone is commanding your attention vs. just being in the background of your mind?

- What does it feel like when you don't have your phone or the room is too quiet? Are you worried about missing out on anything?

- Have you ever noticed what you're thinking about if there's no background noise on?

- Do you ever get a sense that you've been on your phone too long? What are the signs for you?

FIGURE 9. Participants with light smartphone usage

13-year-old male

13-year-old male

13-year-old female

App Categories
- Art and Photos
- Browser
- Calls
- Gaming
- Messaging
- Tools

13-year-old female

App Categories
- Art and Photos
- Browser
- Calls
- Gaming
- Messaging
- Music and Audio
- Social Media
- Tools
- YouTube

FIGURE 10: Participants with longer daily duration of smartphone use

17-year-old male

App Categories
- Art and Photos
- Browser
- Calls
- Email
- Entertainment
- Gaming
- Live Gaming
- Messaging
- Music and Audio
- Parent Controls
- Reading
- Social Media
- Tools
- YouTube

11-year-old female

App Categories
- Art and Photos
- Browser
- Calls
- Education
- Email
- Entertainment
- Gaming
- Live Gaming
- Messaging
- Music and Audio
- Shopping
- Social Media
- Streaming Video
- Tools
- YouTube

12-year-old female

App Categories
- Art and Photos
- Browser
- Calls
- Email
- Gaming
- Messaging
- Music and Audio
- Reading
- Social Media
- Streaming Video
- Tools
- YouTube

14-year-old male

App Categories
- Art and Photos
- Browser
- Calls
- Education
- Email
- Gaming
- Health and Fitness
- Messaging
- Music and Audio
- Shopping
- Social Media
- Tools
- YouTube

FIGURE 11. Participants who primarily used social media apps

16-year-old female

App Categories
Art and Photos
Browser
Calls
Education
Email
Gaming
Health and Fitness
Messaging
Music and Audio
Parent Controls
Shopping
Social Media
Streaming Video
Tools

14-year-old female

App Categories
Art and Photos
Browser
Calls
Education
Email
Messaging
Music and Audio
Parent Controls
Social Media
Streaming Video
Tools
Video Chat
YouTube

12-year-old male

15-year-old female

FIGURE 12: Participants who primarily used mobile games

11-year-old male

App Categories
- Browser
- Calls
- Gaming
- Messaging
- Reading
- Tools

11-year-old male

App Categories
- Browser
- Email
- Entertainment
- Gaming
- Messaging
- Social Media
- Tools
- YouTube

11-year-old male

App Categories
- Art and Photos
- Browser
- Calls
- Gaming
- Messaging
- Social Media
- Tools
- YouTube

14-year-old female

App Categories
- Art and Photos
- Browser
- Calls
- Email
- Entertainment
- Gaming
- Messaging
- Shopping
- Social Media
- Streaming Video
- Tools
- Video Chat
- YouTube

FIGURE 13: Participants who primarily used YouTube apps

11-year-old female

12-year-old female

16-year-old male

App Categories
Art and Photos
Browser
Calls
Email
Entertainment
Gaming
Messaging
Social Media
Streaming Video
Tools
YouTube

15-year-old female

App Categories
Art and Photos
Browser
Email
Entertainment
Gaming
Messaging
Music and Audio
Social Media
Tools
YouTube

Which types of apps did participants use the longest, and why?

While time is often held out as the most important measure of how young people use their screen-based devices, time is only one dimension of the smartphone experience. What young people do, the content they view and the interactions they have on their smartphones are critical components of how they use their devices. Research shows that the quality of the content and types of activities youth engage with online are more strongly associated with well-being (Popat & Tarrant, 2023). For example, creative and positive social uses of media are associated with higher well-being, while viewing more violent or toxic content is linked with more distress. And while our methodology cannot tell us exactly what content youth saw on their phones, understanding what types of apps are used and in what duration gives us a framework to begin to understand youths' exposure to different types of content.

The 203 participants in our sample used a total of 1,644 unique apps over the week that their smartphones were tracked. Individual participants used anywhere from five to 125 different apps over the course of the week, averaging about 40 different apps overall.

When we looked at categories of apps, social media apps were used for the longest each day, on average, followed by YouTube (which includes YouTube, YouTube Kids, and YouTube TV), mobile games, browser, messaging, and streaming video (see Figure 14). When considered as a proportion of a participant's overall smartphone usage, social media (42%), YouTube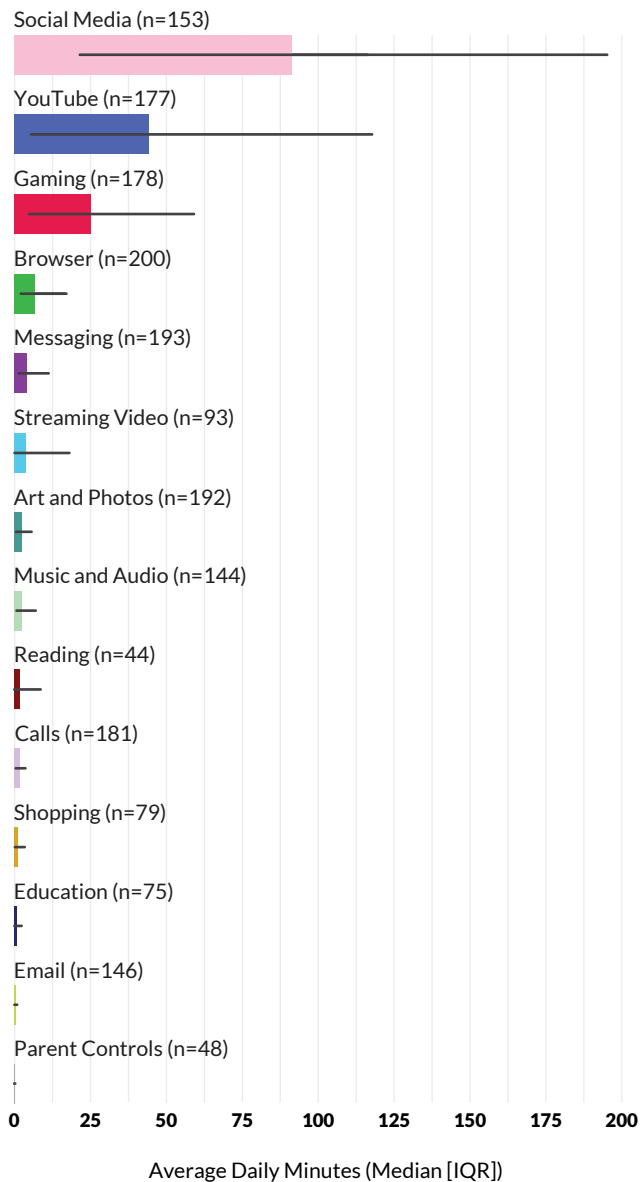 (19%), and gaming (11%) apps took up the largest percentage of time per day, among participants who used those apps. In contrast, despite their popularity, photography/camera apps, phone calls, and music apps were only used for a few minutes per day.

FIGURE 14. Median and IQR* of daily duration of different app categories**, ranked from longest to shortest duration

Average Daily Minutes (Median [IQR])

*Median is the value that 50% of the users are under and 50% are over. IQR is the Interquartile Range, which is the middle 50% of users, with 25% of users under the first value and 25% of users over the second value. Bar shows the median value; black line shows IQR.

**Includes only participants who used that category of apps.

Younger participants had the longest duration of the gaming category of apps. One youth advisor explained the change in smartphone habits by age this way:

> **Definitely with more mature teenage audiences, I feel like there's less game usage ... but I think it also kind of just depends on who the phone user is. But I also think that it can be a mix of both. Like you said, we kind of all get drawn to our phones when we don't have anything to do, and definitely I think that social media has kind of replaced games for older audiences, because it's like you can pick it up and it's quick entertainment, which is kind of like what a game is, it's interactive quick entertainment.**
> **—9th grader**

Over the study week, 657 different mobile games were played overall, of which 211 (32%) had violent content ratings. When looking at the mobile gaming patterns found in our participants, youth advisors found it interesting that some gaming took place at seemingly random times of day. This was explained by the fact that some games send notifications to re-engage the player every day, while other games are designed in ways that expect frequent engagement to maintain progress in the game:

> **This used to apply to me. I'm not active on it anymore. But the game Hay Day is kind of ... it's one of the games where you have to come back at certain intervals to maintain your farm. So I can see that, like waking up at 8 a.m. and coming back to it consistently every day, just being integrated into your schedule because that's how a lot of people are with it. They know that whenever they wake up, oh, there's new things to check, you have to go and maintain your farm, and it's just like part of their everyday lives.**
> **—11th grader**

TABLE 2. Popular apps, their number of users, average daily duration, and percentage of total smartphone use they composed on a typical day*

App name	N (%) users	Average daily duration Median [IQR]**	Range (hour:minutes)	Percentage of daily use (median)***
TikTok	102 (50.2%)	1:52 [0:24 - 2:57]	<0:01 - 7:48	38.4%
YouTube	175 (86.2%)	0:40 [0:05 - 1:52]	<0:01 - 10:13	18.2%
Instagram	70 (34.5%)	0:16 [0:03 - 0:52]	<0:01 - 2:56	5.9%
Snapchat	79 (38.9%)	0:10 [0:02 - 0:36]	<0:01 - 3:13	3.6%
Discord	72 (35.5%)	0:07 [0:02 - 0:24]	<0:01 - 12:20	2.5%
Roblox	74 (36.5%)	0:06 [0:01 - 0:40]	<0:01 - 6:25	2.6%
Chrome	191 (94.1%)	0:04 [0:01 - 0:13]	<0:01 - 1:24	1.5%
Netflix	53 (26.1%)	0:03 [0:01 - 0:17]	<0:01 - 7:31	0.8%
Spotify	81 (39.9%)	0:01 [<0:01 - 0:04]	<0:01 - 0:31	0.6%
Facebook	40 (19.7%)	0:01 [<0:01 - 0:04]	<0:01 - 1:34	0.1%
Google quick search box	180 (88.7%)	0:01 [<0:01 - 0:03]	<0:01 - 0:21	0.6%
Amazon	47 (23.2%)	0:01 [<0:01 - 0:03]	<0:01 - 0:20	0.3%
Pinterest	36 (17.7%)	0:01 [<0:01 - 0:03]	<0:01 - 0:48	0.4%

*Calculated only among participants who used that app.

**Median is the value that 50% of the users are under and 50% are over. IQR is the Interquartile Range, which is the middle 50% of users, with 25% of users under the first value and 25% of users over the second value.

***Percentage of daily use is calculated among those who use the app and as a percentage of all their smartphone use in a day.

Apps that dominate time: TikTok and YouTube

Some of the most popular apps used by 11- to 17-year-olds in our sample are shown in Table 2. Of these, those with the longest daily duration were TikTok, YouTube, Instagram, Snapchat, Discord, Roblox, Chrome, and Netflix. (Of note, although Spotify usually streams music for long periods of time, it is not recorded by our study app as 'in use' because the screen is usually off while music streams).

Figure 15 shows the distribution of daily duration of use of the longest-running popular apps in our sample. TikTok and YouTube had far more users who spent several hours per day using these apps, with 64% spending more than an hour/day on TikTok, and 41% doing the same on YouTube. Our youth advisors attributed this finding to video length, the friction-less features of these platforms, and the algorithmic tailoring of videos to a users' interests, making it difficult to disengage. In contrast, 22% of Snapchat and 7% of Discord users averaged more than one hour/day on these platforms, which youth advisors noted are primarily for chatting with friends, so they are used for briefer snippets of time.

TikTok: Teens talk about the ease and capture of the endless short video scroll

When we asked the youth advisors why their peers scrolled TikTok for nearly two hours a day, taking up almost 40% of their total phone time, they had lots to say! While text-based platforms like Twitter are "more work," TikTok was described as "so easy" because users can simply open up the app and videos start to play endlessly, compared to having to "actively" click on videos. Discussing TikTok, two youth advisors shared:

> **It's just you watch a video and it's interesting and you scroll and it's another interesting video. You don't even have to find videos on your own, it's right there, it's customized, and you can share funny things with your friends, so it's addicting.**
> **—12th grader**

> **I'd say compared to YouTube, [TikTok] is that you don't have to search through to find a video that you wanna watch ... I mean if you're on the Explorer tab for Instagram, or for YouTube, you have to kind of decide, but it does it for you. So you can open the app and instantly have a video you'll probably like.**
> **—10th grader**

FIGURE 15. Average daily duration of select popular apps

TikTok (n=102)

Duration	Percent
0-15 min	22%
15-30 min	5%
30-60 min	10%
1-2 hours	20%
2-3 hours	22%
3-4 hours	10%
4-5 hours	5%
>5 hours	8%

YouTube (n=175)

Duration	Percent
0-15 min	34%
15-30 min	10%
30-60 min	14%
1-2 hours	17%
2-3 hours	10%
3-4 hours	6%
4-5 hours	3%
>5 hours	5%

Instagram (n=70)

Duration	Percent
0-15 min	49%
15-30 min	11%
30-60 min	17%
1-2 hours	11%
2-3 hours	11%
3-4 hours	0%
4-5 hours	0%
>5 hours	0%

Snapchat (n=79)

Duration	Percent
0-15 min	63%
15-30 min	10%
30-60 min	5%
1-2 hours	15%
2-3 hours	5%
3-4 hours	1%
4-5 hours	0%
>5 hours	0%

Discord (n=72)

Duration	Percent
0-15 min	64%
15-30 min	17%
30-60 min	12%
1-2 hours	1%
2-3 hours	0%
3-4 hours	1%
4-5 hours	0%
>5 hours	4%

Roblox (n=74)

Duration	Percent
0-15 min	64%
15-30 min	5%
30-60 min	12%
1-2 hours	15%
2-3 hours	1%
3-4 hours	0%
4-5 hours	0%
>5 hours	3%

Another key piece of TikTok's appeal to teens was that it could be consumed in small bites of time, such as in between classes, compared to more "time-consuming" platforms that need a time or mental investment, such as YouTube or Netflix. They also noted with TikTok how quickly the algorithm can learn what they want and shift to meet their current needs.

> **A lot of people I know are actually defaulting more to TikTok and social media sites where they can get kind of like the quick hit of just like a short video. So I was surprised that some people spent that much time on YouTube 'cause most people I know, if they wanna watch video content, then they'll go to TikTok. You can easily just scroll past it. But then also, they're just so short that even if you're not necessarily that interested, watching it won't really take up that much time anyway.**
> **—10th grader**

Youth advisors also mentioned how design features like lack of friction, infinite content, and the short video format influenced their behavior on TikTok:

> **Something that usually breaks that chain of scrolling on Twitter is ... I'll see a tweet that I've already seen before, so I'm like, 'OK, time for me to get off.' Whereas TikTok there's nothing to really break that chain of constant new information and the stimulation ... But TikTok is definitely more of an internal struggle to actually be like, 'let me get off,' simply 'cause the content is just so easy to consume, so it just feels like an urge to continue to keep scrolling.**
> **—11th grader**

> **TikTok is one of the worst forms of it because it's not much work, you're just scrolling, and also, you keep on scrolling and you're finding maybe these things interesting because your feed is accustomed to you. And it's easy, it's quick, and I feel like that's also why a lot of our attention spans are getting much shorter, because even sometimes ... I'm not on TikTok as much as I used to be, but when I was really on it, I would find myself skipping videos that were over 30 seconds because I couldn't ... I just wanted to keep on scrolling, keep on scrolling.**
> **—11th grader**

Automatic advancement of content feeds also contributed to the "overflowing" experience of using TikTok or YouTube, and the challenges some teens feel in breaking away from the feed of videos:

> **You have to have a bunch of ideas and a bunch of different videos flowing into your mind and just that constant flow of information just overflowing, kind of being overwhelming, I feel like, to an extent. And I feel like for Netflix, though, it's helpful and it's better in terms of splitting up the movies you watch because there's that like ... It's like start the new episode, and then you kinda get that guilt like, 'Oh, should I start this whole new episode and waste another 20 minutes, or should I just go start my homework?' So I feel like that's why TikTok is so much more time-consuming, and YouTube as well, because it just never stops. There's no end... so they all just, I would say, inevitably just keep going on and just blend together.**
> **—10th grader**

We asked youth advisors whether they had tried out time limit features on TikTok or YouTube, and some had—with mixed success:

> I think that most teens don't really follow it, especially if they set it themselves. It has to be parent-enforced with a passcode or whatever for teens to actually follow it. But I feel like, in my experience, for TikTok, I'm spending two or three hours a day on TikTok. And I'll set these restrictions, yet I'll just block it every time I see it. So I find it annoying after a while, but I think it's helpful once I get the notification over and over to realize that I'm really just wasting my time.
> —10th grader

> Personally, I have one on my TikTok for 45 minutes, but there definitely are some days where I see it and it's like, 'You have five minutes left for the day for TikTok,' and I'm like, 'I don't care,' and I just ignore it. [chuckle] So I think it depends on how I'm feeling in the day, 'cause sometimes I do follow that guideline or that restriction, but sometimes I don't.
> —11th grader

> But I also know that YouTube has a sleep notification. Like sometimes I get, 'It's time for bed,' and then you could dismiss it or continue on the app.
> —11th grader

TAKEAWAYS

Time on smartphones among young people is dominated by apps that provide social interaction, entertaining videos, and games—many of which have design features that encourage prolonged engagement. These include finely tuned algorithms that can even adapt to how a child or teen is feeling in the moment, infinite scrolling of content made by creators who are competing for attention, and "frictionless" navigation. (In contrast, a design feature that adds friction would slow down navigation, cause the user to pause and make a decision, let them know that they are "caught up," or encourage them to take a break.) TikTok in particular was described by our youth advisors as having a lot of engaging ingredients as well as an ability to be consumed in bite-size bits during downtime or in between classes. In contrast, apps that young people use for goal-oriented purposes (such as taking photos, shopping, or looking something up on a browser) commanded much less time. Caregivers should be sensitive to the fact that the companies who build apps have incentives to design features that capture kids' attention for longer (such as wanting more advertising revenue or data collected for targeted marketing), and it's not just kids' lack of "willpower" that keeps them on their phones.

TALKING POINTS

Adults can ask:

- Which apps take up most of your time (and my own time, as a parent)? Why is this?

- Are there design features that make your favorite app hard to put down?

- What do you think social media platforms know about us, in terms of who we are and how we are feeling? How do algorithms predict what we might want to watch or follow?

- How do you see the platform's algorithms at work? Have you noticed when it's working to keep you on the app, and how it does that?

- What are some ways to be "in the driver's seat" while using your phone, other than timers that don't always work? Are there ways to be conscious of the need to not use your phone at certain times of day? Are there places that you could keep your phone, some apps that you could remove, or "do not disturb" settings that could help you feel more in control?

NSFK? What we found about participants using apps intended for older audiences

App stores have age ratings that recommend how old the users of specific apps should be, but these are not routinely enforced. Age-restricting "gates" on apps and app stores, such as entering a birth date, have always been easy to get through. This means that it is easy for young smartphone users to wade (or intentionally jump) into territory that was not intended for them. Therefore, we explored whether our participants appeared to be accessing age-inappropriate apps on their smartphones.

Under-13s regularly use social media and age-inappropriate apps

Of 85 participants who were younger than 13, 68% used social media apps, and they all used at least one app rated "Teen" or higher. Among 11- to 12-year-olds, the most popular social platforms were:

TikTok
47%

Snapchat
31%

Discord
25%

Facebook
16%

Instagram
16%

Pinterest
14%

WhatsApp
8%

Twitter
7%

BeReal
6%

Facebook Messenger
6%

sendit
5%

Reddit
4%
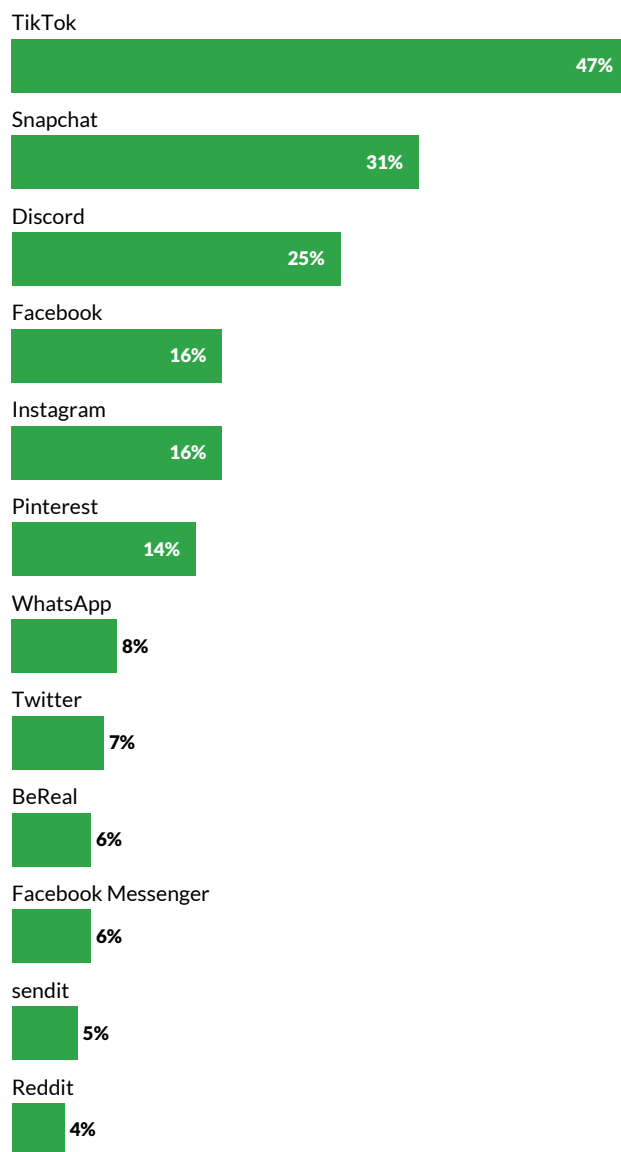
Almost half of our participants used apps with mature/adult age ratings

Use of mature (17+) or adult only (18+) apps was relatively common, occurring in 45% of participants. These included Pornhub, fantasy sports/betting apps (Yahoo Fantasy Sports & Daily, Sleeper Fantasy Football), Telegram, Reddit, Parler, 4chan, casino games, or violent games such as Call of Duty.

Sexy themes show up in some apps, mostly video games

Of all the apps used by participants in this study, 47 had content flags about sexual themes, nudity, or suggestive themes, 34 of which were video games.

Use of risky anonymous social platforms

In addition, 14 participants used social media apps with risky features, like being able to connect with strangers for messaging, sending photos, or video chat. These included Obimy (allows random contacts between users), Monkey (allows users to chat with "new people all over the world"), TIYA (allows chats with "strangers and friends"), and LMK (allows instant talking and dropping into audio rooms with strangers). These apps potentially open child and adolescent users to unsafe or exploitative interactions with others.

SCREENSHOTS from app store descriptions of social media apps that provide anonymous connections (L to R: Monkey, TIYA, Obimy, LMK)
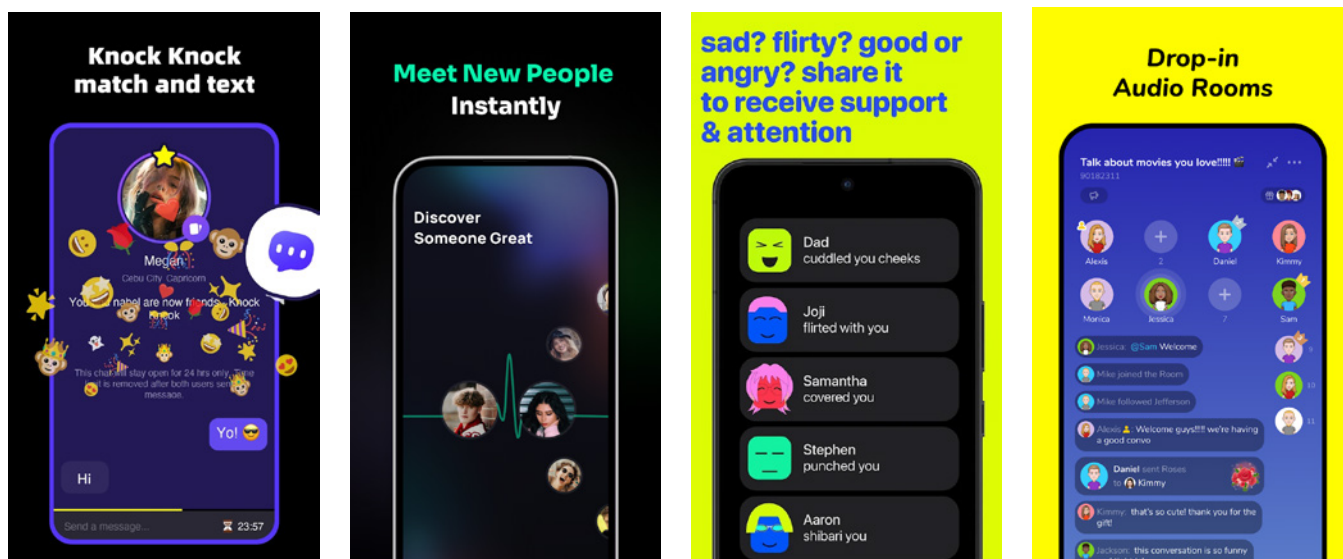
How many smartphone notifications are young people receiving per day, and from what apps?

Notifications from apps on our smartphones—whether seen, heard, felt or silent—are a frequent occurrence for many teen and adult smartphone users. Compared to smartphone pickups (see Main Findings section 1), which indicate how often a user engages with their phone (regardless of whether they are responding to a notification), notifications signify how often the phone itself is pinging for attention. These notifications can helpfully direct us to an important message, but can also serve as a potent distraction from other activities and draw the user back to their device. Notifications are also one of the main smartphone design features that users have control over, which means they can be modified with the goal of improving focus, family time, or sleep.

Notifications on our participants' smartphones registered in two ways: notifications delivered and notifications seen by the user (indicating that they looked at the notification or had their phone screen on when they received the notification). On a typical day, participants had a median of 237 notifications delivered to their smartphone, and they saw or engaged with 46 of these. This varied considerably between participants, likely because of the different apps they use, how they manage notifications, and whether they use "do not disturb" settings at certain times of day. Notifications were most numerous from apps young people use to chat with their friends, such as Snapchat, Instagram, and Discord (see Table 3), which is consistent with how youth advisors said they prioritized their notifications from people they know, rather than from random platforms, brands, or channels.

> I know that TikTok, whenever it sends you notifications, it combines all of them into one. So if you have a bunch of likes on a post, it won't send you a notification for each individual one. It will compile it and it'll be like, 'You have 16 new notifications,' whereas Snapchat, every time you get a Snapchat from somebody, it'll give you an individual message, or every time someone's typing, you'll get an individual message for that, and then on top of that, their chat. So those compile very quickly.
> —11th grader

> I get most excited over Snapchat notifications, and it doesn't really matter who it's from. I think that's solely because you get the little Bitmoji, you get to see who it's from and it's a person every time, whereas with TikTok or Instagram, the platform sends you so many just random notifications that aren't really relevant, there aren't people interacting with you, that they're kind of uninteresting.
> —11th grader

> When I had Discord, it was really, really annoying with every single message 'cause it wasn't relevant to me at all, and I just wanted messages from my friends that I've personally DMed ... there's multiple channels, and if you don't, I guess, mute certain channels, you will get every single notification.
> —11th grader

When plotted over the 24 hours in a day (midnight to midnight), seen notifications appeared to jump in the morning hours (possibly when overnight "do not disturb" settings were disabled or participants first picked up their phones in the morning) and then peak in the late afternoon/evening. (See Figures 16 and 17).

Similar to patterns seen with pickups and duration, younger users (11-12 years) tended to receive and view fewer notifications than older users (13-15 and 16-17 years).

Youth advisors explained that it is essential to turn off notifications to reduce the feeling of overload and interruption:

> I think notifications are very annoying. I have mine off or always on 'do not disturb,' especially during school, 'cause I feel like after a while, they just compile and then it's just notification after notification, and then I can't even see previous notifications. And then it's just a lot of information with just picking up my phone, and it's almost like the app is trying to get you to get more involved and go back to the database.
> —10th grader

They described needing to not just manage the volume of notifications, but also the proliferation of types of notifications from different platforms, to keep things in check and make space for communication with friends.

> Another thing with notifications, one thing I've noticed with Instagram is, over time, they keep adding new, different types of notifications. Like when they rolled out reels, they had a notification like, 'Check out the most watched reels for today.' So over time, you have to keep turning off those specific notifications because I still wanna receive messages from my friends through DMs. I don't wanna receive those kind of unimportant messages.
> —11th grader

> I think it's seen as a way to just re-instill interest in their app after long periods of time of not being on it, and it's just a way to keep you engaged with it, because by sending you so many random things, it's bound to hit your interest eventually. But generally, I do think it's annoying [chuckle] because so many of them are just irrelevant, and I think that if they sent less of them, it would be a better way of going about that.
> —11th grader

TABLE 3. Notifications delivered and seen by the most popular apps

App name	N (%)** who received notifications	Median [IQR]* notifications delivered per day	Range*	N (%)** who viewed notifications	Median [IQR]* notifications seen per day	Range*
Snapchat	78 (39.2%)	19.6 [5.0 - 67.3]	0.1 - 1026.2	75 (37.7%)	8.3 [2.9 - 27.0]	0.2 - 363.6
Discord	59 (29.6%)	11.8 [3.4 - 42.3]	0.1 - 763.7	57 (28.6%)	4.7 [1.6 - 17.9]	0.1 - 491.6
Instagram	70 (35.2%)	8.9 [3.3 - 27.7]	0.2 - 808.6	69 (34.7%)	5.6 [2.0 - 14.6]	0.1 - 121.0
Facebook	37 (18.6%)	4.0 [1.4 - 5.8]	0.1 - 15.4	36 (18.1%)	3.2 [0.8 - 5.0]	0.1 - 7.8
TikTok	79 (39.7%)	2.9 [1.4 - 5.1]	0.1 - 16.1	76 (38.2%)	1.7 [1.0 - 4.3]	0.1 - 13.2
YouTube	141 (70.9%)	2.4 [1.0 - 6.4]	0.1 - 122.2	127 (63.8%)	1.8 [0.7 - 4.3]	0.1 - 90.6
Pinterest	37 (18.6%)	1.9 [1.1 - 2.2]	0.2 - 17.4	36 (18.1%)	1.6 [1.1 - 2.1]	0.1 - 6.1
Roblox	7 (3.5%)	0.2 [0.1 - 1.0]	0.1 - 8.3	5 (2.5%)	0.2 [0.2 - 0.3]	0.1 - 0.3

*Calculated only among participants who received or viewed notifications from that app, respectively.

**Percentage of 199 participants with notification data.

FIGURE 16. Hour-by-hour plots of average notifications* delivered to participants' smartphones, by age
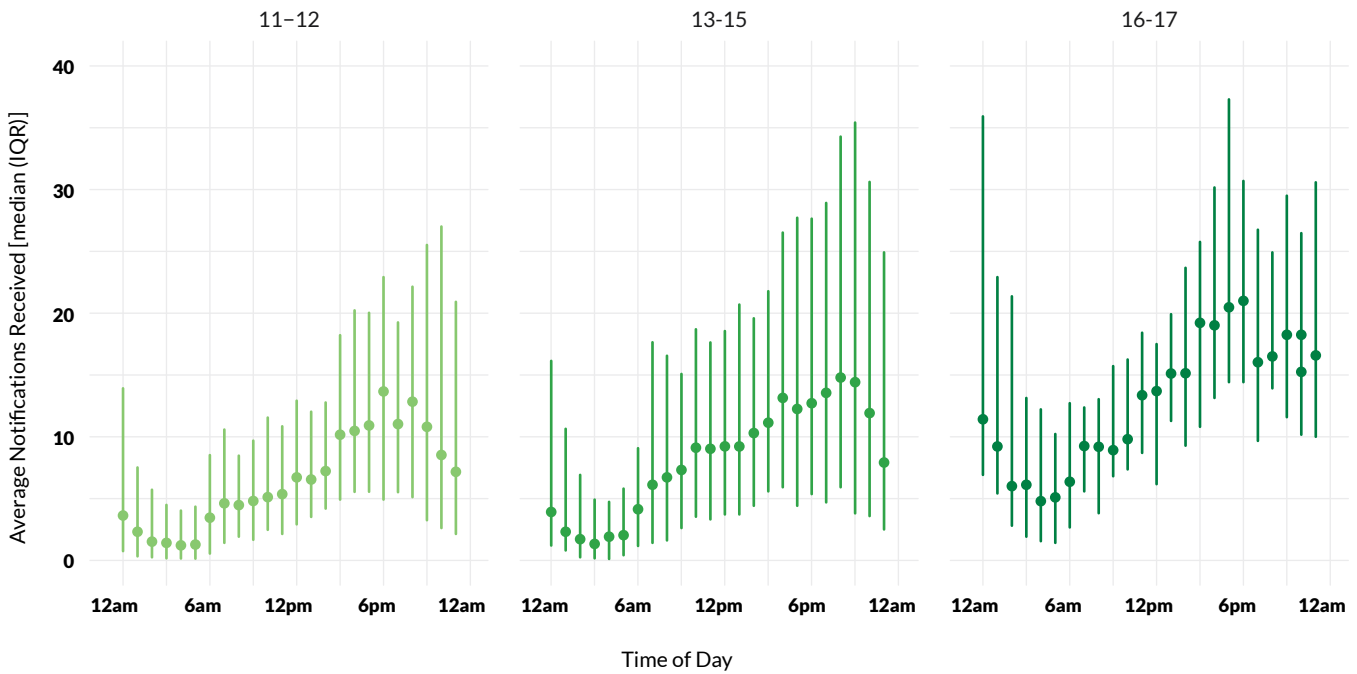
11–12 13-15 16-17

Average Notifications Received [median (IQR)]

Time of Day

*Median is the value that 50% of the users are under and 50% are over. IQR is the Interquartile Range, which is the middle 50% of users, with 25% of users under the first value and 25% of users over the second value. Dot shows the median value; line shows IQR.

FIGURE 17. Hour-by-hour plots of average notifications* seen or interacted with by participants, by age
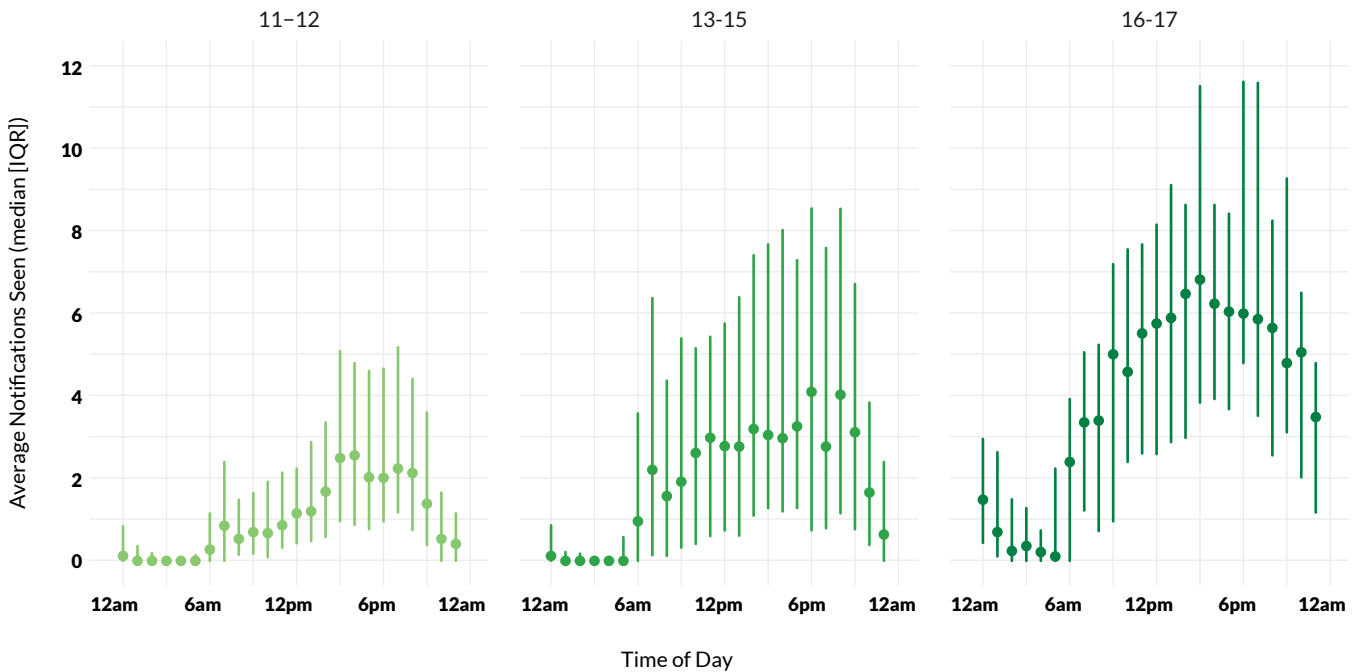
11–12 13-15 16-17

Average Notifications Seen (median [IQR])

Time of Day

*Median is the value that 50% of the users are under and 50% are over. IQR is the Interquartile Range, which is the middle 50% of users, with 25% of users under the first value and 25% of users over the second value. Dot shows the median value; line shows IQR.

TAKEAWAYS

Notifications are plentiful, sometimes fun, sometimes annoying, and they are one of the main things young people can control in their smartphones. Notifications from marketers were the least essential and most irritating to the adolescents we talked to, who were also wary of platforms trying to get their attention in inauthentic ways (e.g., by telling them when a distant acquaintance had posted but didn't tag them). One of the main things caregivers and teachers can do is help young people reflect on how smartphone notifications affect their emotions, concentration, and habits of checking their device—and then empower young users to manage their notifications and set "do not disturb" times that align with their needs.

TALKING POINTS

What adults can say and do:

- Try looking at settings for screen time and digital wellness on your phone, and on your child's phone, to talk about which apps send you the most notifications.

- Then discuss how to intentionally update the settings (both within apps and in phone notification settings) to cut out all of the extra disruptions that young people mention as their biggest annoyance.

- Although it takes time to do it, stopping to reflect on how your phone tries to get your attention can lead to great discussions in families and classrooms, and it can give users a feeling of control over how much they use their smartphone.
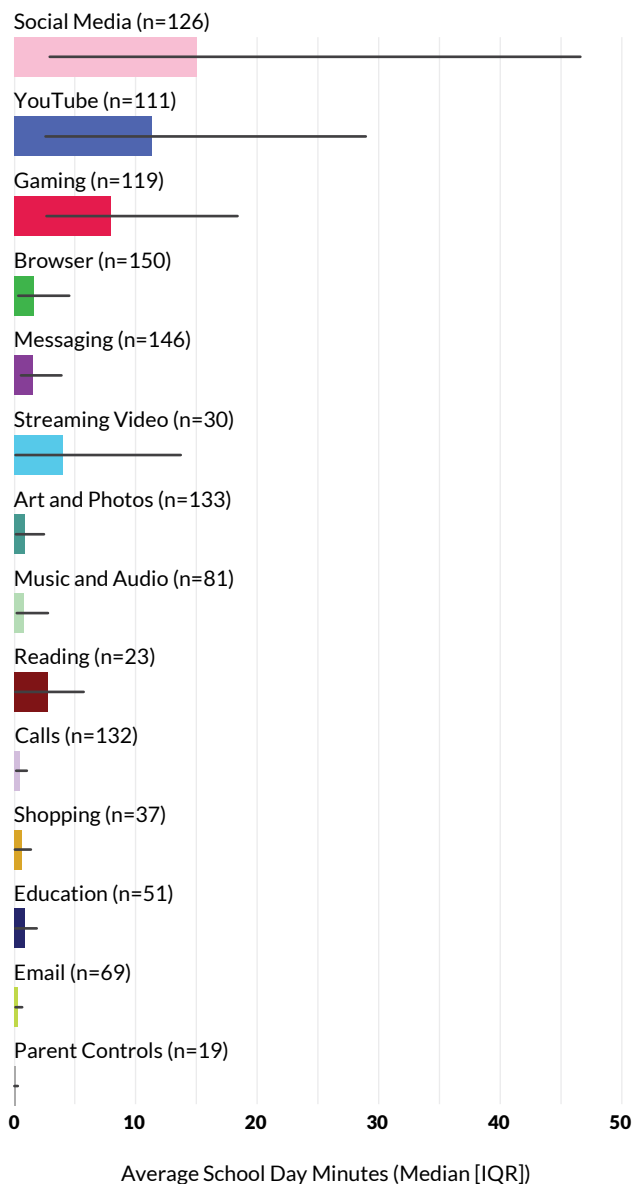
How much does smartphone use occur during school hours, and why?

Phone use in school has been a subject of intense public debate, but for many young people it is a necessity, as their phones may contain school schedules and allow coordination with family and friends. It is also a potential source of distraction or avoidance when school feels stressful.

Among the participants in our study, some degree of smartphone usage during school hours (Monday through Friday 8 a.m. to 3 p.m.) was nearly universal, and median use was about 43 minutes/day. Young people handled their phones quite a bit during the school day with a median of 13 pickups (turning the screen on) during school hours, ranging from <1 to 229. Smartphone usage visualizations shown in Figures 10, 11, 12, and 13 illustrate the variety of patterns of smartphone usage during school hours. Although messaging and browser app categories were most frequently used during school hours, this averaged only a few minutes, while social media (32% of smartphone usage during school hours), YouTube (26%), and mobile games (17%) took up the largest proportion of time during school hours, among participants who used those types of apps.

Surprisingly, parental control apps sent the highest number of notifications during school hours, sending a median of nearly 30 notifications to young people, with 70 notifications/school day at the top end. Other app categories sending the most notifications during school hours were social media (median 5.6, max 759), messaging (median 3.4, max 158), and browser (median 4.0, max 403). Notifications seen during school hours were mostly social media (median 2.7, max 205), messaging (median 2.0, max 92), and browser (median 1.3, max 159), which is consistent with the ways youth advisors said they used their phones during school hours.

FIGURE 18. Median and IQR* of duration of use of different smartphone app categories during school hours**

Average School Day Minutes (Median [IQR])

*Median is the value that 50% of the users are under and 50% are over. IQR is the Interquartile Range, which is the middle 50% of users, with 25% of users under the first value and 25% of users over the second value. Bar shows the median value; black line shows IQR.

**Includes only participants who used that category of apps during specified time frame (Aug. 29 onward; holiday dates removed from analysis).

Youth advisors provided insight into why they would use phones in school, when, and what effect it has on them. Many described using the phone to take small breaks during lunch or class, but also noted it could be challenging to keep the phone use to their preset goals or a minimum:

> **Sometimes I use my phone just to scroll during lunch. If I have a free period, like on the rare occasion that I do have a free period, sometimes I'll use my phone ... but I generally try to avoid touching my phone during school because I don't want it to throw me off ... the reason why I try not to touch it at all, 'cause even if I set the boundary of, 'OK, maybe I'll only be on my phone for a cumulative of 30 minutes of the school day,' it's hard to know whether I can actually stick to that boundary, so I'd rather just not pick it up in the first place to prevent going over that boundary.**
> **—11th grader**

> **Yeah, it's the same for me, but sometimes if it's a Friday and it's last period and I'm so drained, sometimes I go on TikTok for the last 15 minutes just to get me through it, just 'cause when you're on TikTok, you lose track of time. So if I'm scrolling on TikTok for what it feels like five minutes, it's actually been like 13 minutes, and I'm like, 'Nice. Now the school day is over.'**
> **—11th grader**

School policies and smartphones

School phone policies varied widely among the adolescents we talked to. For example, some youth advisors described having a total ban on smartphones in their high schools, with detentions resulting if students used their phone. In other schools, youth advisors described having policies that ranged from no restrictions or class-specific rules, including teachers encouraging use during class (e.g., to look something up or participate in class discussions), allowing students to use phones once they completed in-class assignments, and generally allowing smartphone access between periods. Some youth advisors' teachers used strategies such as having students put their phone in a bag at the front of class, to avoid it being a distraction. School policies also varied by the age of students, with the high school age youth advisors reflecting back on stricter rules in middle school.

> **It's just like, 'Don't use it during class.'**
> **—11th grader**

> **It's supposed to be no phone until passing times, that's like four minutes long, but the reality, students just use it if they wanna use it. And teachers will start off saying, 'Don't use it,' but if students want to use it, who's really gonna stop them? ... Teachers definitely say, 'Put your phones away,' but students get clever. And also just because of the phone problem, there's a new rule where you trade in your phone for the pass to go to the restroom. 'Cause you spend more time probably in the bathroom with your phone there.**
> **—12th grader**

> **Definitely at lunch, I could see people using their phone a lot. But in class, it depends on the school, but if your school has everyone with computers, then I think computers. If you're gonna get distracted doing something, it would be on computers.**
> **—11th grader**

The inconsistency between different teachers and classroom expectations can be frustrating to some adolescents, but stricter rules are sometimes appreciated in retrospect:

> **Well, generally my school is pretty relaxed. It's just some teachers that really do not like phones in their classrooms. And I feel with those teachers that are really strict on it, I feel like if anything, it just causes kids to wanna act out even more. Because now it's not like, 'Oh, I have my phone out and she's telling me respectfully, like, hey, could you put this away?' Now it's like this whole big deal where the kid's like, 'Oh, but it's not fair that I never get to use my phone.' When I was in middle school, we had super, super strict [rules about] phone use, and at the moment I was like, 'Yeah, this is so annoying,' but now, looking back on it, it actually was a really good thing.**
> **—11th grader**

> **We have a no-phone rule, and if it's out, the deans and our teachers are pretty harsh about giving us detentions. So I think that mostly keeps our phones away, but I would definitely say in class if we're just ... If I'm done with an assignment, my phone will be in my backpack and I'll tap the screen to see if there's any notifications. And obviously it's kind of pointless because it's like, OK, well, you can't actually open those notifications, but it's just like seeing what's there, and I think that's kind of the addicting part of it ... But yeah, I would say I think the rules kind of help us, and I personally am OK with it, yeah. And I think most of my friends would agree too.**
> **—9th grader**

Use during school hours was predominantly social media apps, which youth advisors said is consistent with their experience of enjoying checking in with friends, coordinating meeting up, and getting small doses of fun. However, they also recognized when phone use becomes too distracting, is an avoidance strategy, or serves the purpose of relieving boredom.

> **In my school, we tend to have longer passing periods, or at least they're close enough together that lots of students will arrive at class and then check their email on their phone or check Snapchat in the remaining time they have before class starts.**
> **—10th grader**

> **I think for school, using it just for communication, like just texting friends to meet up sometime during lunch or something, that's definitely useful. But then when it becomes distracting, getting a lot of notifications in class and stuff, it can become a problem.**
> **—11th grader**

> **I played spring sports, so being able to check my phone and make sure if we weren't sure about the weather and knowing whether or not the game is happening or where we were meeting, that was really helpful. It's harder to check on my computer than it is on a phone. Not me personally, but there's definitely kids who listen to music during class or during lunch instead of interacting with other kids. So I think that would be an area in which it's not helpful ... [this is driven by] I think either stress or boredom, generally boredom.**
> **—10th grader**

I really don't find having my phone next to me in class a distraction. If anything, it's just like, oh, I have my phone there in case I need it. But when I do use my phone in school, I find that it's either to look something up because I don't really under-stand something, or just after I've finished all my work, just to be able to relax for a little bit ... I will say that I'm at least tapping my phone to see if I got a notification or just opening it really quickly to maybe scroll on Instagram while I'm waiting for the teacher's directions or something like that.
—11th grader

Currently, my school is really lenient about phone rules and our teachers are OK with us using laptops or iPads to help us learn, to take down notes. And we also, at any moment, can just access our phone, just not doing tests or quizzes or anything that it's like an assessment ...
And even if, sometimes let's say you get bored in class, if it's just for a few seconds our teachers allow us to just quickly check our phones, and then reset and then come back with a better sense of concentration.
—12th grader

TAKEAWAYS

Smartphone use in schools is not driven only by young people's interests and behaviors; it is also largely shaped by school phone policies and how they are enforced. Phone policies vary by child age. For example, middle schoolers often have stricter rules about not using phones in class, while some high schools allow students more phone use (Tandon et al., 2020). This is an opportunity for students to learn self-regulation and intentional (in other words, not habit-driven) smartphone usage. Since school is one of the main environments where adolescents interact with their peers, it makes sense that phones are being used for that purpose.

TALKING POINTS

What adults can say and do:

- Ask: What are your school's policies for tech use? How well are those rules enforced by teachers, and do students follow them? What do you think are the positive and negative effects of these policies?

- Adults can help children and adolescents reflect on how using smartphones in school makes your brain feel (in terms of emotions, attention, and thinking), and when it's an avoidance strategy.

- If they don't want to talk about their own phone use during school, ask about peers' use: When does your child think that other kids are using their phones too much, and why?

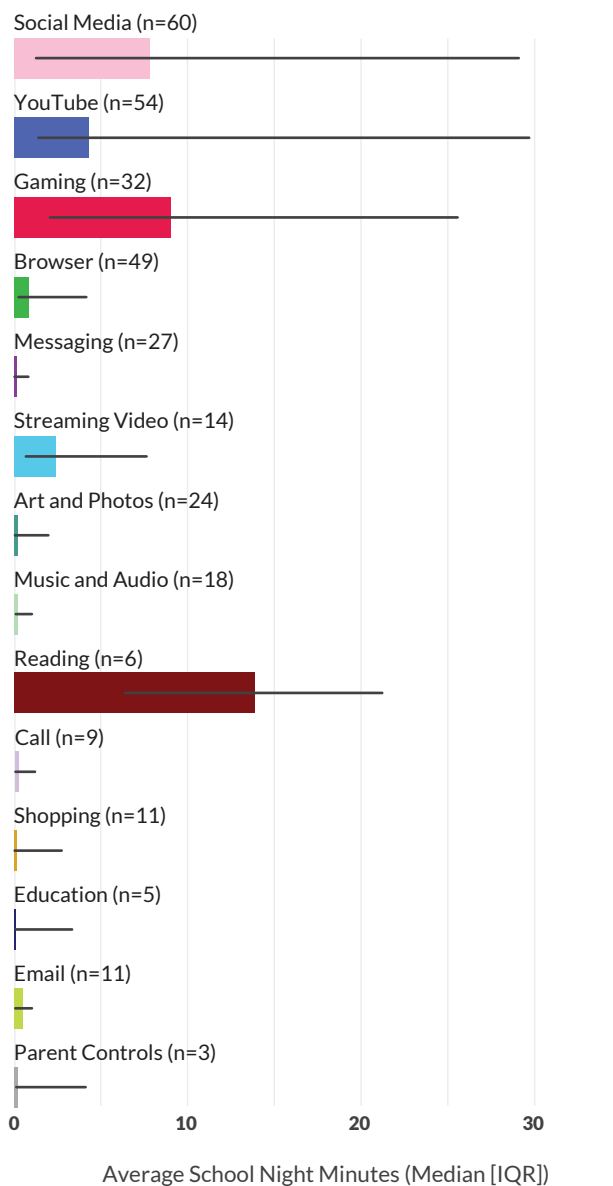## How much smartphone use occurs during school night hours, and why?

Sleep is critical for the health and development of children and adolescents. Concerns and debate over the role of phones and apps on the sleep habits of teens and tweens have been ongoing, but studies have rarely looked at the patterns of smartphone use that occur overnight. We focused specifically on school nights because insufficient sleep before school can contribute to feeling unfocused, sleepy, and irritable.

Almost 60% of participants used their smartphone during school night hours (Monday through Friday, midnight until 5 a.m.) at least once during the study period. Overnight usage on school nights was shorter (median 19.8, range less than one minute to 300 minutes) than non-school nights (median 30.3, range less than one minute to 299 minutes)—typically 20 vs. 30 minutes, respectively. As is illustrated in Figures 9, 10, 11, 12, and 13, social media, gaming, and YouTube were the most commonly and longest-used app categories during school night hours. Specific apps seemed particularly engaging over-night, including mobile games like Nikke, Klondike, Random Dice, WWE Super Card, or Cat Game. The longest-running social media app overnight was TikTok.

On a typical school night, the median number of times a teen or preteen picked up their smartphone was 1.0, ranging up to 18 times in a night. Both notifications delivered and notifications seen on school nights were relatively sparse, with a median of less than one per night for most app categories.

Interestingly, the category with one of the highest rates of notifications overnight was parental control apps (median 15.3 delivered, 0.4 seen, ranging up to 38 delivered and 15 seen per night). This might reflect parental controls pinging users to tell them they've exceeded bedtime limits.

FIGURE 19. Median and IQR* of duration of use of different smartphone app categories during school nights**

Average School Night Minutes (Median [IQR])

*Median is the value that 50% of the users are under and 50% are over. IQR is the Interquartile Range, which is the middle 50% of users, with 25% of users under the first value and 25% of users over the second value. Bar shows the median value; black line shows IQR.

**Includes only participants who used that category of apps during specified time frame (Aug. 29 onward; holiday dates removed from analysis).

Youth advisors thought it was unsurprising that participants showed this pattern of smartphone use into the overnight hours, focusing on apps that let them relax and have fun during what may be their main "downtime." The low frequency of notifications seen is also consistent with the fact that many young people put "do not disturb" settings on overnight.

> I know that, at least for me, a lot of people would be still on their phone like at 12 or 1 a.m.
> —11th grader

Youth advisors described that time with their phone before bed might be the only free downtime —*their time*—that they have in the day, so they want to use it on something pleasurable, like social media or videos/movies.

> Realistically when you're in school, you can't really use your phone. When you get home, especially if you're in middle school or high school, you're spending hours doing homework, and maybe after-school stuff. And then when you get home, you're spending hours doing homework. So I know a lot of people, especially my age, they will stay up late because they feel like that's really the only time that they can be on their phones or that they can really do anything outside of school. So it's really not that surprising when you actually think about it. But initially it is like, 'Oh, yeah, they should be sleeping,' but it actually does make sense.
> —11th grader

However, youth advisors endorsed that smartphone use at night is a mixture of procrastination (because falling asleep means they have to wake up for the next day, which is school), losing track of time, and wanting to calm down.

> For me, going on TikTok or something before I go to sleep, it's like a way for me to procrastinate actually going to sleep. So now when I go to sleep, I wake up and then I'm going back to school and it's back to the stresses of life. But when I'm in bed is the one time where I really don't have to do anything, so I'm kind of happy to put off sleeping if I can just chill for like another hour or something.
> —11th grader

> And then, also I think definitely before bed, the times that show in the night, I think that especially right before bed, if you're not feeling extremely tired 'cause you just did a ton of homework, so you're ready to go, you're feeling productive, I feel sometimes when you get into bed, you don't necessarily feel ready to go to sleep. So one of the things you'll do is just pull out your phone. And I definitely don't think that's healthy at all, which is why my parents make me keep my phone downstairs when I go to bed. But yeah, I would say that that kind of explains the really late times of using it.
> —9th grader

Youth advisors also recognized the way different apps' design affordances influence their ability to fall asleep, although this might vary between adolescents:

> I definitely would stay up very late most nights if I was on YouTube or Instagram. I've caught myself like, 'Oh, it's already an hour past when I was planning to go to bed, and I'm just there on my phone on Instagram.' ... Reading or entertainment or calls...would probably go a lot less late because I feel like that's not keeping you glued to the screen.
> —10th grader

> I think that's the case with social media, but not with YouTube. I often watch YouTube right before I fall asleep and it doesn't cause any problems for me. It helps me fall asleep, actually. So that's one way it could be helpful. TikTok, I think for everybody at least, is just a bunch of videos over and over again, so a lot of information coming in at once, as well as a variety of colors and flashing lights in a sense. And then what I like to do on YouTube is listen or watch long video essays that are a couple of hours long and I'll just put that on and I'll fall asleep to it and I won't even look at the screen. So I think that helps, in a sense, not keep me up.
> —10th grader

TAKEAWAYS

Phone use at night serves several purposes for young people, primarily to try to unwind at the end of the day (something parents use it for too!). However, our youth advisors felt that social media and video content is both relaxing and sleep-displacing, and can become a procrastination strategy. The adolescents we talked to who reported putting their phone in another room, using "do not disturb," or other strategies to limit phone use overnight had less complicated narratives about phone use at night. In addition to using strategies to keep phones quiet at night, it's also important to understand how much pressure young people feel during the day, and give them time to decompress with or without technology, so they are not packing this into the end of the day.

TALKING POINTS

What adults can do and say:

- If your child is using their phone a lot at the end of the day, talk with them about what the rest of their day looks like: Are they getting enough time to relax and unwind? Are they overscheduled or having difficulty finishing homework? Strategize on how to help de-stress the other parts of their day first.

- If your child finds it hard to separate from their phone at night, talk about what types of apps or content "wake their brain up" versus help them let go and calm down, and try to only use the calmer apps before bed.

- Our youth advisors told us that timers and limits aren't always effective, but they can remind you that you've spent more time on an app than you intended, so they're worth a try for kids who feel like they're wasting time watching videos or reading other people's posts.

- Experiment with a few nights of using the "do not disturb" settings, or putting the phone in another room overnight (for parents, too). Reflect with your child the next day about how it felt.

How much tension or frustration are preadolescents and adolescents experiencing about their smartphones? How do they manage this, and what does it mean for how phones could be designed better?

Prior research shows that young people have complicated relationships with their phones, and often need to put in effort to feel positive and balanced with the rest of their lives. Based on responses of our 203 participants to the Technology Impairment Scale in the survey portion of our study, we found that the majority endorsed "sometimes" or "often" using technology in ways that interfered with socializing in person, getting enough sleep, disengaging from media when they wanted to, or following through on chores (Figure 20).

Surprisingly, about one-fifth to one-third of participants endorsed feeling like technology was getting in the way of other things "often." Thirty-six percent of participants reported they often find it difficult to stop using technology once they have started; 30% reported often using it to escape from sorrow or get relief from negative feelings; 18% reported often being short of sleep due to being on their phone or the internet late at night; 18% reported often feeling restless, frustrated, or irritated when they could not access the internet or check their phone; 20% reported often choosing to spend more time online rather than going out with others; and 16% often neglected daily obligations such as school or family life due to using technology. These technology impairment reports increased as participants got older.

Youth advisors told us that their relationship with their smartphone evolved with age, based on experience, trial and error, spending more time on their phone, and their growing reflection and self-awareness:

FIGURE 20. Self-reported technology management challenges of 203 11- to 17-year-olds

Do you find it difficult to stop using technology such as the internet or your mobile phone, once you start?

| 14% | 50% | 36% |

Are you short of sleep due to being on your phone or the internet late at night?

| 33% | 49% | 18% |

Do you neglect your daily obligations (school or family life) because you are using technology?

| 39% | 45% | 16% |

Do you feel restless, frustrated, or irritated when you cannot access the internet or check your mobile phone?

| 30% | 53% | 18% |

Do you use technology to escape from your sorrow or get relief from negative feelings?

| 31% | 39% | 30% |

Do you choose to spend more time online over going out with others?

| 42% | 38% | 20% |

■ Never   ■ Sometimes   ■ Often

> **Because you're with 10- to 12-year-olds who maybe just got their first phone and that's all that they wanna do, that's all they wanna use, and they don't really have as much self-control. Because it does … Your relationship with your phone changes. As you grow older, you realize like, hey, there's a time and a place, and right now isn't that place. So I feel like now that I'm in high school and they kind of … It's your decision. If you wanna be on your phone while they're teaching a lesson, that reflects on you. You know what I mean? And so I feel like it's also something that comes with age.**
> **—11th grader**

They also describe needing strategies to feel like they are in control of their phone use, and not vice versa. These primarily focused on curation of what apps they use and send them notifications:

> I also have 'do not disturb' on, occasionally, but for the most part I just manually go into settings and turn off any apps that I think don't really require notifications. Like what [another Youth Advisory Council member] said, Spotify or any fitness apps. I don't work out often so I don't really need it. For social media apps and just texting and stuff, my phone is always on vibrate. And I don't really text people much besides like immediate family and a few close friends. So besides that, I get maybe just a hundred notifications per day, which I think is a healthy amount. For apps, like gaming apps on my phone, I don't really play games on my phone, it's just too small for me. And I feel like that really helps me just concentrate and focus on just talking to a few friends and family rather than playing around and receiving like a thousand notifications per day.
> —12th grader

> I think if you're an active user of your phone, there's so many notifications you're gonna get from different platforms that you're not even using, they're not even just for communication. You're just gonna get so many that if you don't curate, you're gonna be overwhelmed.
> —11th grader

They also talked about adding friction to their phone use at times of day when they want to resist the urge to check notifications:

> I always keep my phone on 'do not disturb' at night, just so that I'm not tempted to go on my phone, but I also don't keep it in my bedroom.
> —9th grader

> Yeah, I do, sometimes when I'm asleep, I have 'do not disturb' on, and I usually also put it on airplane mode. Sometimes if I just wanna stop any sort of interaction with my phone, I'll just put on airplane mode.
> —10th grader

> Well, one thing that I've changed this year is for text message notifications. I used to have it so that when I open my phone, it shows the actual message, but now I have it so that it just has two notifications because it makes it a little bit less tempting to click on it and a little bit easier to say, 'OK, I'll look at this later.'
> —10th grader

Youth advisors reflected on how limits placed by outside forces, such as a screen time notification or parent rules, were less effective than students' own self-motivated strategies:

> **For me, my parents were concerned about my phone usage time for a while, but any time they tried to put the restriction, it didn't really work out that well. But when I put on my own restrictions, they lasted a lot or they have been lasting a lot longer and actually worked ... I think, in a sense, my parents being really into it was a little bit coun-teractive because it made me less willing to do it 'cause I felt like I didn't want them to take away my phone really, and I just used it more. And then when ... The further we got out from COVID, I real-ized how much time I was spending on my phone and that I think I could have come to a little sooner if I didn't feel the need to go against my parents.**
> **—10th grader**

> **When I'm doing homework, what I do a lot to avoid going on my phone is I set ... I had this app, and it's like ... I don't know. It's like growing a plant, so like the time that you put your phone down and you don't touch it and you don't open up your phone, the plant grows, so it's like a little incentive.**
> **—10th grader**

Discussion

Children's smartphone use is a common source of frustration for adults. We worry that kids are spending too much time, too much attention, and are being exposed to too many negative things through these handheld computers that burst into our lives 15 years ago. However, as adults, we also need to recognize that this generation of young people haven't been given other technological options (aside from flip phones) to carry out the developmentally appropriate task of connecting with their peers, exploring their identities, and learning about the world independently. The device that's available to them is also a potent marketing vehicle that tries to keep them engaged and profile their interests.

In this study, we have explored this topic by combining insights from the usage data of 203 young people's smartphones with the narratives of youth advisors. Our goal is not to add to the debate about when children or teens should get smartphones, but instead to see the issue from the perspective of how smartphones shape the experiences of young people. Without understanding how young people build relationships with these technologies that contain their friendships, entertainment, stress relievers, and distractions—and how this depends upon design features of the phones themselves—we will not be able to support their healthy technology use.

Therefore, our takeaways and recommendations for caregivers and teachers revolve around supporting, scaffolding, and building insight around young people's smartphone use, rather than judging them. We do kids and their digital well-being a disservice by being overly negative and prescriptive, since this will likely only shut down conversations and make young people feel that they cannot come to us when they experience phone-related challenges—which most do, at one time or another.

In addition, our recommendations are focused on the smartphone manufacturers, operating systems, platforms, and apps that make up kids' digital ecosystems. There is clear room for improvement when apps are pinging for attention during the school day; when teens can access pornography sites, sports betting, or other apps rated as "Adult"; and given that the majority of 11- to 12-year-olds in our sample broke through social media age gates.

From a research perspective, our results are consistent with other published research in terms of the amount of time that adolescents self-report spending on social media (Rideout, 2022). App tracking also provides insights into the times of day when phones are used and notifications are delivered. The adolescents we interviewed pointed out that the most significant limitation of app tracking is that it doesn't tell researchers what type of content the participant is seeing, what they are posting, or how they are engaging with others. One focus group participant said, "Although some people can be on the same app for the same amount of time in a day, they can be on completely different sides of the apps and consuming different types of content and just utilizing the apps in different ways." Therefore, future research will need to supplement this method with either screenshots (e.g., citizen science-type sampling) or youth self-reporting about what they encountered on different platforms and how it made them feel.

Another limitation is that app usage statistics are currently available only from Android devices. However, because Android device users tend to be from lower socioeconomic strata than iPhone users (e.g., see Radesky et al., 2020), this allowed us to enroll a more diverse sample.

Recommendations for parents and caregivers

Specific talking points and conversation starters are described in the prior sections, but they all involve a few important concepts:

1. It can be challenging to strike a positive balance between smartphone usage and the other parts of life that matter to tweens and teens. Rather than jump to judgment or frustration, adults should be curious about their experiences to meet them where they are.

2. Kids are often worried that parents will take away their phones if they reveal negative experiences. Let your child know at the outset that they can tell you about anything that happens on their phone and you'll help them through it.

3. Parents themselves use smartphones for several hours per day, and sometimes the same apps that kids use. Use this as a way to reflect, exchange experiences, or experiment with changes in phone use to consider how it changes your mood, concentration, and sleep.

4. Every child is different, and their use of phones and social media will reflect that individuality. Understanding and accepting your child's unique way of living in the world is a big part of understanding and communicating about their phone use.

5. Installing parental controls, filters, timers, and other device restrictions is the main option that lots of parents have for monitoring their child's phone use, but these are blunt tools that require a lot of upkeep and parent involvement. Most importantly, none of them will tell you how your child is feeling. Have regular conversations to understand how they feel about their life online.

Recommendations for industry

We conclude by listing several insights from this research that could be used to improve the smartphone user experience for young people. Children and adults are provided the same options for smartphone models, operating systems, and app stores, which means that they are subject to the same business models, content problems, and persuasive design practices. Not surprisingly, young users are putting in a lot of work to manage their relationships with smartphones. While it is important not to restrict young people's opportunities to find good content and information through their phones, device and app design could be improved to ease this process for young people and their parents. Below are some actions that companies and product designers could take to go beyond their current menu offerings of parental controls and truly bake youth-centered design into their products:

1. Create user interface and onboarding processes (for example, when a young user first gets a phone or creates an account) that easily allow users to set "do not disturb" times, manage when they want to get notifications and from whom, and set goals for how much they would like to use their phone. These settings should not be buried or need a separate app to install. This sets the norm that it's important to be intentional about the time and place when smartphone use does and does not fit daily life.

2. Work with adolescents and families to design ways to revisit settings and goals regularly, and to adapt as young users grow, learn about their smartphone habits, and develop different daily routines and interests. Different seasons or school years present appropriate times for prompts and reflection cues that would engage young users in the process of thinking about smartphone balance.

3. Update operating systems so that they help notify apps, app stores, and platforms that the user is a child or adolescent. This way, apps and stores can use responsible settings that don't recommend risky content or apps.

4. Mobile carriers should make more affordable, intermediate device options available to families when they want to get a phone that is more than a flip phone, but not a full-access smartphone. Phone models are being introduced that might serve kids better at different developmental stages, but they are often expensive or not compatible with various phone plans.

5. Currently, digital wellness options include timers, lockouts, and "do not disturb" settings, which have variable effectiveness according to the adolescents we interviewed. Some young users have developed approaches like adding friction or avoiding certain content during evening hours, but this is far from universal. In fact, two-thirds of our sample felt their phone use impinged upon important parts of their life like sleep or emotional coping. Youth-centered co-design of smartphone options with adolescents would move the burden away from individual children and onto the digital ecosystem around them. Such an approach would benefit our population as a whole (Frieden, 2010).

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Supplemental Tables

SUPPLEMENTAL TABLE 1. Select app categories: Average daily duration and percentage of daily use*

App Category	N (%) users	Average Daily Minutes (Median [IQR]**)	Range	Percentage of Daily Use (median)***
Overall	203 (100%)	266.5 [159.5 - 406.9]	2.7 - 976.1	–
Messaging	193 (95.1%)	4.1 [1.6 - 11.5]	0.01 -102.8	1.7%
Calls	181 (89.2%)	1.7 [0.6 - 3.8]	0.004 - 49.0	0.7%
Education	75 (36.9%)	0.8 [0.1 - 2.5]	0.004 - 65.1	0.3%
Video Chat	61 (30.0%)	0.3 [0.01 - 3.6]	0.002 - 136.8	0.1%
Reading	44 (21.7%)	1.8 [0.1 - 8.8]	0.001 - 273.8	0.7%
Art and Photos	192 (94.6%)	2.5 [0.7 - 5.8]	0.002 - 43.1	0.9%
Browser	200 (98.5%)	6.8 [2.2 - 17.3]	0.01 - 611.6	2.7%
Email	146 (71.9%)	0.5 [0.1 - 1.1]	0.002 - 24.1	0.2%
Social Media	153 (75.4%)	91.6 [21.7 - 195.7]	0.01 - 806.4	41.5%
Gaming	178 (87.7%)	25.1 [5.0 - 59.4]	0.002 - 681.2	10.9%
Live Gaming	15 (7.4%)	0.1 [0.01 - 0.3]	0.002 - 5.7	0.01%
YouTube	177 (87.2%)	44.3 [5.6 - 118.1]	0.01 - 613.2	19.3%
Streaming Video	93 (45.8%)	3.9 [0.2 - 18.3]	0.002 - 452.0	1.6%
Music and Audio	144 (70.9%)	2.4 [0.8 - 7.2]	0.002 - 102.6	1.0%
Shopping	79 (38.9%)	1.1 [0.3 - 3.6]	0.01 - 55.6	0.3%
Parent Controls	48 (23.6%)	0.1 [0.1 - 0.4]	0.002 - 47.8	0.1%
News and Magazines	11 (5.4%)	3.6 [0.4 - 7.8]	0.003 - 33.4	2.9%

*Calculated only among participants who used that app category.

**Median is the value that 50% of the users are under and 50% are over. IQR is the Interquartile Range, which is the middle 50% of users, with 25% of users under the first value and 25% of users over the second value.

***Percentage of daily use is calculated among those who use the app category and as a percentage of all their smartphone use in a day.

SUPPLEMENTAL TABLE 2. Select app category duration and notification frequency during school hours*

App Category	N (%) users**	Median (IQR) duration of daily use during school hours***	Percentage of school hours use***	Notifications received school hours (median [IQR])****	Notifications seen school hours (median [IQR])****
Overall	187 (96.9%)	42.7 [19.1 - 93.4]	–	50.1 [20.2 - 100.4]	12.6 [3.9 - 33.9]
Messaging	146 (75.6%)	1.5 [0.6 - 3.9]	3.8%	3.4 [1.0 - 9.5]	2.0 [0.6 - 5.3]
Calls	132 (68.4%)	0.4 [0.1 - 1.0]	1.1%	1.1 [0.4 - 2.1]	0.5 [0.3 - 1.2]
Education	51 (26.4%)	0.8 [0.1 - 1.9]	1.4%	1.4 [0.6 - 3.2]	1.1 [0.6 - 2.8]
Reading	23 (11.9%)	2.8 [0.1 - 5.7]	3.5%	0.7 [0.4 - 1.1]	0.6 [0.3 - 1.0]
Art and Photos	133 (68.9%)	0.9 [0.2 - 2.5]	1.5%	0.8 [0.4 - 1.7]	0.4 [0.3 - 0.7]
Browser	150 (77.7%)	1.6 [0.4 - 4.5]	3.5%	4.0 [1.9 - 6.0]	1.3 [0.6 - 2.5]
Email	69 (35.8%)	0.3 [0.1 - 0.7]	0.4%	2.4 [0.7 - 7.7]	1.2 [0.5 - 2.8]
Social Media	126 (65.3%)	15.0 [2.9 - 46.6]	32.3%	5.6 [1.5 - 19.0]	2.7 [0.8 - 11.3]
Gaming	119 (61.7%)	8.0 [2.7 - 18.4]	17.3%	1.3 [0.4 - 2.9]	0.8 [0.3 - 2.3]
YouTube	111 (57.5%)	11.3 [2.6 - 28.9]	25.7%	1.0 [0.5 - 3.4]	1.0 [0.4 - 2.7]
Streaming Video	30 (15.5%)	4.0 [0.1 - 13.7]	5.4%	0.3 [0.2 - 1.0]	0.4 [0.2 - 1.0]
Music and Audio	81 (42.0%)	0.8 [0.2 - 2.8]	1.6%	0.9 [0.5 - 2.4]	0.4 [0.2 - 1.2]
Shopping	37 (19.2%)	0.6 [0.1 - 1.4]	0.6%	1.0 [0.3 - 2.1]	0.8 [0.3 - 1.8]
Parent Controls	19 (9.8%)	0.1 [0.03 - 0.3]	0.2%	29.4 [0.7 - 45.6]	2.0 [0.7 - 5.1]

*For 193 participants enrolled from Aug. 29 on; holiday dates removed from analysis.

**Number (percentage) of participants who used the app category during school hours; this differs from the number of participants who received or viewed notifications.

***Calculated only among participants who used that app category.

****Calculated only among participants who received or viewed notifications from that app category, respectively.

SUPPLEMENTAL TABLE 3. Select app category duration and notification frequency on school nights*

App Category	N (%) users**	Median (IQR) duration of daily use during school night hours***	Percentage of school night hours use***	Notifications **received** school night hours (median [IQR])****	Notifications **seen** school night hours (median [IQR])****
Overall	114 (59.1%)	19.8 [1.1 - 46.1]	–	15.9 [4.7 - 47.6]	2.5 [0.6 - 8.1]
Messaging	27 (14.0%)	0.2 [0.03 - 0.8]	0.9%	0.5 [0.2 - 1.0]	0.3 [0.1 - 0.6]
Calls	9 (4.7%)	0.2 [0.03 - 1.2]	6.0%	0.5 [0.2 - 0.8]	0.4 [0.2 - 0.6]
Education	5 (2.6%)	0.1 [0.1 - 3.3]	0.5%	0.3 [0.2 - 0.5]	0.3 [0.2 - 0.5]
Reading	6 (3.1%)	13.9 [6.4 - 21.2]	18.2%	0.3 [0.2 - 1.0]	0.5 [0.2 - 0.6]
Art and Photos	24 (12.4%)	0.2 [0.1 - 2.0]	0.8%	0.3 [0.2 - 0.6]	0.2 [0.1 - 0.4]
Browser	49 (25.4%)	0.8 [0.3 - 4.2]	4.9%	3.5 [1.6 - 5.3]	0.6 [0.2 - 1.2]
Email	11 (5.7%)	0.5 [0.1 - 1.0]	0.6%	1.2 [0.3 - 4.3]	0.6 [0.3 - 1.0]
Social Media	60 (31.1%)	7.8 [1.3 - 29.1]	38.6%	1.2 [0.4 - 4.9]	1.0 [0.3 - 3.2]
Gaming	32 (16.6%)	9.0 [2.1 - 25.6]	29.0%	0.6 [0.2 - 1.1]	0.5 [0.2 - 1.0]
YouTube	54 (28.0%)	4.3 [1.4 - 29.7]	46.9%	0.8 [0.4 - 1.3]	0.4 [0.2 - 0.9]
Streaming Video	14 (7.3%)	2.4 [0.7 - 7.6]	5.1%	0.3 [0.2 - 0.5]	0.2 [0.2 - 0.3]
Music and Audio	18 (9.3%)	0.2 [0.1 - 1.0]	1.0%	0.8 [0.5 - 2.0]	0.2 [0.1 - 0.4]
Shopping	11 (5.7%)	0.2 [0.04 - 2.7]	0.3%	0.3 [0.1 - 0.5]	0.3 [0.2 - 0.6]
Parent Controls	3 (1.6%)	0.2 [0.1 - 4.1]	9.7%	15.3 [2.3 - 17.0]	0.4 [0.3 - 1.0]

*For 193 participants enrolled from Aug. 29 onward; holiday dates removed from analysis.

**Number (percentage) of participants who used the app category during school night hours; this differs from the number of participants who received or viewed notifications.

***Calculated only among participants who used that app category.

****Calculated only among participants who received or viewed notifications from that app category, respectively.

About Common Sense

Common Sense is the nation's leading nonprofit organization dedicated to improving the lives of all kids and families by providing the trustworthy information, education, and independent voice they need to thrive in the 21st century. Our independent research is designed to provide parents, educators, health organizations, and policymakers with reliable, independent data on children's use of media and technology and the impact it has on their physical, emotional, social, and intellectual development. For more information, visit **commonsense.org/research**.

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