PewResearchCenter

Berkman
The Berkman Center for Internet & Society at Harvard University

AUGUST 22, 2013

Teens and Mobile Apps Privacy

58% of American teens have downloaded an app to a cell phone or tablet. More than half of teen apps users have avoided an app due to concerns about sharing their personal information—and girls are especially likely to take steps to protect their location data.

Mary Madden
Senior Researcher, Pew Internet Project

Amanda Lenhart
Senior Researcher, Director of Teens and Technology Initiatives, Pew Internet Project

Sandra Cortesi
Fellow, Director of the Youth and Media Project, Berkman Center for Internet & Society

Urs Gasser
Executive Director, Berkman Center for Internet & Society

http://pewinternet.org/Reports/2013/Teens-and-Mobile-Apps-Privacy.aspx

FOR FURTHER INFORMATION, CONTACT:

Pew Research Center's Internet & American Life Project
1615 L St., N.W., Suite 700
Washington, D.C. 20036

Media Inquiries:
202.419.4500

Summary

As more teens gain access to smartphones and tablets that are optimized for mobile applications, teens, like their adult counterparts, have embraced app downloading. But many teen apps users have taken steps to uninstall or avoid apps out of concern about their privacy. Location information is considered especially sensitive to teen girls, as a majority of them have disabled location tracking features on cell phones and in apps because they are worried about others' access to that information. Here are some of the key findings in a new survey of U.S. teens ages 12-17:

- 58% of all teens have downloaded apps to their cell phone or tablet computer.
- 51% of teen apps users have avoided certain apps due to privacy concerns.
- 26% of teen apps users have uninstalled an app because they found out it was collecting personal information that they didn't wish to share.
- 46% of teen apps users have turned off location tracking features on their cell phone or in an app because they were worried about the privacy of their information.
- Among teen apps users, girls are considerably more likely than boys to say they have disabled location tracking features (59% vs. 37%).

Main Findings

58% of teens have downloaded an "app" to their cell phone or tablet computer.

As part of an ongoing collaboration with the Berkman Center for Internet & Society at Harvard University to study American teens' technology use and privacy-related behaviors, the Pew Internet Project has undertaken a study that focuses specifically on youth use of mobile software applications or "apps," using both a survey and focus group interviews. The focus on apps in this study follows policy maker[1] and advocates' interest in the topic, as growing numbers of teens gain access to internet-enabled smartphones and tablet computers.[2]

The nationally representative survey of youth and parents finds that 58% of all U.S. teens ages 12-17 have downloaded a software application or "app" to their cell phone or tablet computer. Among American teens, 78% of teens have a cell phone[3] and 23% of teens have a tablet computer; 82% own at least one of these mobile devices. Within this subgroup of teens who own cell phones or tablets, 71% say they have downloaded an app to one of those devices. These figures are higher than similar measures of adult app downloading on mobile devices.[4]

As noted in previous reports, older teens are more likely than younger teens to own cell phones, but teens of all ages are equally likely to own tablets.[5] However, among teens who own at least one of these mobile devices, app downloading does not vary significantly by age; 66% of those ages 12-13 download apps, compared with 73% of those ages 14-17.

[1] Federal Trade Commission, "Kids and Apps: Current Privacy Disclosure on Apps are Dis*app*ointing," http://www.ftc.gov/os/2012/02/120216mobile_apps_kids.pdf and Federal Trade Commission, "Mobile Apps for Kids: Disclosures Still Not Making the Grade," http://www.ftc.gov/os/2012/12/121210mobilekidsappreport.pdf

[2] For trends in teen internet access and device ownership, see: http://www.pewinternet.org/Reports/2013/Teens-and-Tech.aspx

[3] Almost half (47%) of these cell-owning teens report that they have smartphones. That translates into 37% of all teens who have smartphones, up from just 23% in 2011.

[4] In 2011, 34% of adults reported downloading apps to either a cell phone or tablet. Full results available here: http://pewinternet.org/Reports/2011/Apps-update/Overview.aspx

[5] See demographic tables in the "Teens and Technology 2013" report: http://www.pewinternet.org/Reports/2013/Teens-and-Tech/Main-Findings/Teens-and-Technology.aspx

Downloading apps

Among teen cell/tablet owners, the % in each group who download apps

		% who download apps
All teen cell/tablet owners (n=668)		**71%**
Teen Gender		
a	Boys (n=329)	79[b]
b	Girls (n=339)	62
Parent Race/Ethnicity		
a	White, Non-Hispanic (n=463)	72
b	Non-white (n=163)	68
Age of Teen		
a	12-13 (n=180)	66
b	14-17 (n=488)	73
Parent Education		
a	No high school diploma (n=182)	68
b	Some College (n=163)	68
c	College + (n=320)	76
Parent Household Income		
a	Less than $50,000/yr (n=236)	60
b	$50,000/yr or more (n=391)	79 [a]

Source: Pew Internet Teens and Privacy Management Survey, July 26 – September 30, 2012. N= 668 teens who own a cell phone or tablet ages 12-17. Interviews were conducted in English and Spanish and on landline and cell phones. The margin of error for results based on teen cell/tablet owners is +/- 4.4 percentage points.

Note: Percentages marked with a superscript letter (e.g., [a]) indicate a statistically significant difference between that row and the row designated by that superscript letter, among categories of each demographic characteristic (e.g. age).

While cell phone ownership does not vary by gender and teen girls are somewhat more likely to own tablet computers, boys are the ones who stand out as the most active app downloaders. Boys who are mobile device owners are significantly more likely than girls to say that they have downloaded an app to their cell phone or tablet computer (79% vs. 62%).

Teens living in wealthier households are more likely than those in lower income homes to download apps. Eight in ten (79%) teen mobile device owners living in households earning $50,000 or more per year download apps, compared with 60% of those living in households earning less than $50,000 per year. Teen app downloading does not vary significantly according to a parent's education level or by their race or ethnicity.

Focus group discussions suggest that teens often choose free apps.

In focus group discussions with teens, participants said they primarily downloaded social media and game apps to their phones and tablets, though they also downloaded apps relating to music, news, and the weather. When choosing which apps to download, participants stated that they typically downloaded free ones:

> **Female (age 13):** *"Usually, I just stick to free ones. Because if I don't like it, I can just delete it. And it doesn't matter."*
>
> **Female (age 12):** *"A lot of times I don't have money [to download an app that costs money], so it [downloading the free one] is my only option."*
>
> **Female (age 13):** *"You can't be sure if it's going to be a good app but if it's free, you can just delete it."*
>
> **Female (age 17):** *"[For some apps,] there's one or two added benefits to paying for it. But they're not so substantial that you need to have it and need to pay $1.99."*
>
> **Female (age 17):** *"[I download] whichever one [app] is free."*
>
> **Female (age 17):** *"I don't think I've ever paid for an app."*

However, participants also considered a variety of factors to determine the quality of the app. These factors included the number of downloads, the reviews, the ratings, and the appearance of the app:

> **Female (age 19):** *"I look at the pictures to see if the game is cool."*
>
> **Female (age 13):** *"I look at the reviews, and pictures, to see what they look like."*
>
> **Female (age 17):** *"I look at the reviews on Google Play. I look to see what people are saying."*
>
> **Male (age 17):** *"If it got a million downloads, I'm like, OK, it's cool, people are downloading. But if it's got like ten downloads..."*

Although teens may be downloading free apps because of financial considerations, or being able to delete the app without consequence if they don't like it, it can sometimes be related to the fact that teens may not need permission from their parents when downloading free apps:

> **Interviewer:** *"Do you have to ask your parents before you download an app?"*
>
> **Female (age 12):** *"I have to ask if it costs money but if it is free..."*

Half of teen apps users have avoided an app due to concerns about the personal information they would have to share in order to use it.

As we have found with adults, many teen apps users also avoid certain apps when they have privacy concerns.[6] Half (51%) of teen apps users say that they have decided not to install a cell phone or tablet app after they found out they would have to share personal information in order to use it.[7]

Younger teen apps users ages 12-13 are more likely than older teen apps users 14-17 to say that they have avoided apps over concerns about personal information sharing (56% vs. 49%). Boys and girls are equally likely to avoid certain apps for these reasons. There are no clear patterns of variation according to the parent's income, education level or race and ethnicity.

One in four teen apps users have uninstalled an app because they found out it was collecting personal information that they didn't want to share.

A smaller segment of teen apps users (26%) say they have removed an app from their cell phone or tablet after they found out it was collecting personal information that they didn't wish to share.[8] Boys and girls and teens of all ages who are app downloaders are equally likely to say they have uninstalled apps for this reason. As is the case with avoiding apps, there are no clear patterns of variation in app deletion according to the parent's income, education level or race and ethnicity.

[6] See "Privacy and Data Management on Mobile Devices," available at: http://pewinternet.org/Reports/2012/Mobile-Privacy.aspx

[7] In a previous survey, roughly the same number (54%) of adult cell phone apps users said they avoided downloading certain apps for this reason. However, the question was not asked of tablet owners and is therefore not directly comparable. http://pewinternet.org/Reports/2012/Mobile-Privacy.aspx

[8] Roughly the same number (30%) of adult cell phone apps users said they removed certain apps for this reason. As noted above, the question was not asked of tablet owners and is therefore not directly comparable. http://pewinternet.org/Reports/2012/Mobile-Privacy.aspx

Teen apps privacy actions by demographic

% of teen app downloaders within each group who do the following…

		Avoided App	Uninstalled App
All teen app downloaders (n=489)		**51%**	**26%**
Teen Gender			
a	Boys (n=253)	47	24
b	Girls (n=236)	55	29
Age of Teen			
a	12-13 (n=122)	56 [b]	27
b	14-17 (n=367)	49	26
Parent Race/Ethnicity			
a	White, Non-Hispanic (n=344)	52	24
b	Non-white (n=115)	51	34
Parent Education			
a	HS Grad or less (n=128)	49	33
b	Some College (n=107)	51	23
c	College + (n=254)	52	22
Parent Household Income			
a	Less than $50,000/yr (n=146)	45	32
b	$50,000/yr or more (n=311)	55	23

Source: Pew Internet Teens and Privacy Management Survey, July 26 – September 30, 2012. N=489 teens who download apps. Interviews were conducted in English and Spanish and on landline and cell phones. The margin of error for all teen app downloaders is +/- 5.2 percentage points.

Note: Percentages marked with a superscript letter (e.g., [a]) indicate a statistically significant difference between that row and the row designated by that superscript letter, among categories of each demographic characteristic (e.g. age).

Close to half of teen apps users have turned off location tracking on their cell phone or in an app because they were worried about other people or companies accessing that information.

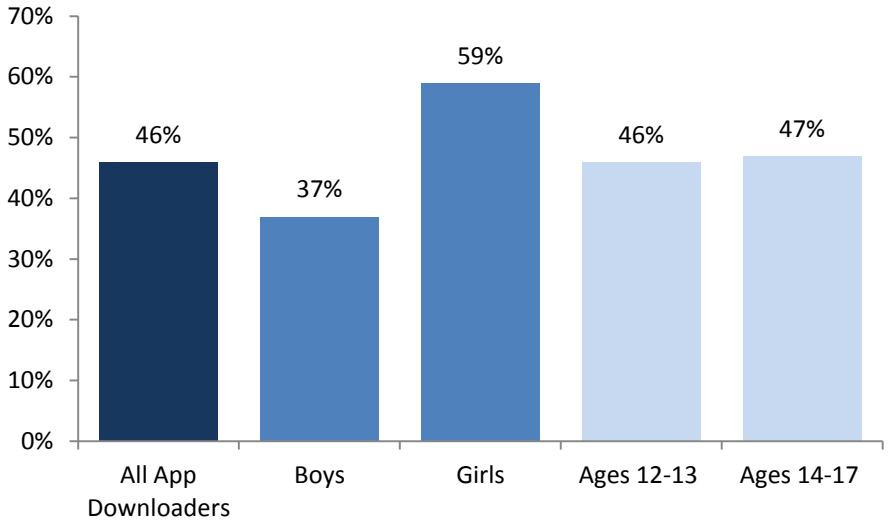
Location-based information is considered sensitive for many teen apps users. Some 46% of them have turned off the feature on their cell phone or in an app because they were worried about other people or companies having access to that information. However, some of the people they are concerned about

may be their own parents. As early as 2009, the Pew Internet Project found that about half of parents of teen cell phone owners said they used the phone to monitor their child's location in some way.[9]

Girls are far more likely than boys to say that they have turned off location tracking features on their cell phone or in an app. Among app downloaders, 59% of teen girls said they had disabled location tracking, compared with just 37% of teen boys. Teens of all ages are equally likely to turn off location tracking features on their phones and apps.

Turning off location-tracking features

Among teens who download apps, the % who have turned off location tracking features on their phones or in apps



Source: Pew Internet Teens and Privacy Management Survey, July 26 – September 30, 2012. N=489 teens who download apps. Interviews were conducted in English and Spanish and on landline and cell phones. The margin of error for all teen app downloaders is +/- 5.2 percentage points.

As is the case with avoiding and uninstalling apps, the likelihood that a teen apps user will disable a location tracking feature does not vary significantly according to the parent's income, education level or race and ethnicity.

Focus group participants understood that apps can access various data on their smartphones and tablets, such as their pictures, contacts, or location. In many cases, they reported that they did not allow an app to access their location, unless they thought it was necessary.

[9] This parental location monitoring could take many forms—including the use of calling, texting or GPS to keep track of a child's location. The question wording did not specify what tools parents had used. http://www.pewinternet.org/Reports/2010/Teens-and-Mobile-Phones/Chapter-4/Parents-and-limits-on-cell-phone-use.aspx

Interviewer: *"Do you ever worry about what kind of data apps are taking from your phone?"*

Male (age 18): *"They [the app] request [access to personal information]. I didn't really know what it [the app] was using it [personal information] for. Like an app wanted to use location services for some reason. But I didn't see the reason why."*

Female (age 19): *"It [the app] tells you what it does on the description thing. It tells you that it can collect data if it wants to. So you're aware of that."*

Female (age 17): *"You can just reject the [app's access to] information and still get the app."*

Female (age 13): *"I always hit 'don't allow' to use my location."*

Male (age 13): *"Yeah, I hit don't allow when it says that [this app would like to use your current location]...unless it's very necessary for the app."*

Female (age 13): *"Like Google Maps – if you're trying to find your way to somewhere, [sharing your location is] necessary."*

However, some focus group participants aligned with the less concerned segments of teen apps users and did not express a high level of concern that apps might collect information about them. Although some reported deleting apps (along with the data stored on their devices) when they no longer used them, they did not report any concerns about the app continuing to have their information through app-specific accounts or other means.

Male (age 13): *"I usually just hit allow on everything [when installing an app]. Because I feel like [the app] would get more features. And a lot of people allow, so it's not like they're going to single out my stuff. I don't really feel worried about it."*

Female (age 16): *"I think the only apps I've ever had that accessed my pictures were my Facebook and my Twitter. But if I have pictures, they're probably already out there."*

Female (age 19): *"I mean, the only thing on my phone is just pictures and messages. So it's not really like, "oh, you're [the app company] going to take my identity or anything," so it doesn't really matter.*

Male (age 16): *"I felt fine with it [apps accessing my personal information]. I always let them access my pictures and everything."*

In the survey, teens who had at some point sought outside advice about privacy management were considerably more likely than those who had not sought advice to say that they had disabled location tracking features. As the Pew Internet Project reported recently, 70% of teen internet users have sought advice from someone else at some point about how to manage their privacy online.[10] Among these "online privacy advice seekers" who own mobile devices, 50% have turned off the location tracking feature on their cell phone or in an app, compared with 37% of those who have not sought outside advice on ways to manage their privacy online. Avoiding and uninstalling apps was equally prevalent among advice seekers and non-seekers alike.

[10] Full report, "Where Teens Seek Privacy Advice" available at: http://pewinternet.org/Reports/2013/Where-Teens-Seek-Privacy-Advice.aspx

Survey Questions

Teens and Privacy Management Survey 2012 EXCERPT

Data for July 26–September 30, 2012

Princeton Survey Research Associates International for
the Pew Research Center's Internet & American Life Project

Sample: n= 802 parents of 12-17 year olds and 802 teens ages 12-17
Interviewing dates: 07.26.2012 – 09.30.2012

Margin of error is plus or minus 4.5 percentage points for results based on total parents [n=802]
Margin of error is plus or minus 4.5 percentage points for results based on total teens [n=802]
Margin of error is plus or minus 4.6 percentage points for results based on total teens [n=781]
Margin of error is plus or minus 4.6 percentage points for results based on teen internet users [n=778]
Margin of error is plus or minus 5.1 percentage points for results based on teen SNS or Twitter users [n=632]
Margin of error is plus or minus 5.3 percentage points for results based on teens with a Facebook account [n=588]
Margin of error is plus or minus 9.4 percentage points for results based on teens with a Twitter account [n=180]

TEEN INTERVIEW

K2 As I read the following list of items, please tell me if you happen to have each one, or not. Do you have...[INSERT ITEMS IN ORDER]?

	YES	NO	DON'T KNOW	REFUSED
a. A cell phone... or an Android, iPhone or other device that is also a cell phone[11]				
Current Teens	78	22	0	0
July 2011	77	23	0	0
September 2009	75	25	0	0
February 2008	71	29	0	--
November 2007	71	29	0	--
November 2006	63	37	0	--
November 2004	45	55	0	--
b. A desktop or laptop computer[12]				
Current Teens	80	20	0	0
July 2011	74	26	0	0
September 2009	69	31	0	0
February 2008	60	40	0	--
November 2007	59	41	0	--

[11] Prior to 2009, trend wording was "A cell phone". Item wording in September 2009 and July 2011 was: "A cell phone... or a Blackberry, iPhone or other device that is also a cell phone"
[12] In November 2004 and November 2006, "desktop computer" and "laptop computer" were asked as separate items. Results shown here have been recalculated to combine the two items.

	November 2006	79	21	0	--
	November 2004	75	24	1	--
c.	A tablet computer like an iPad, Samsung Galaxy, Motorola Xoom, or Kindle Fire				
	Current Teens	23	77	0	0

K16 Have you ever downloaded a software application or "app" to your cell phone or tablet computer, or have you never done this?

Based on teens who have a cell phone or tablet [N=668]

% CURRENT TEENS	
71	Yes, have done this
29	No, have never done this
*	Phone/Tablet can NOT download apps (VOL.)
*	Don't know
0	Refused

K17 Have you ever [INSERT ITEMS; RANDOMIZE]?

Based on teens who download apps to their cell phone or tablet [N=489]

		YES	NO	DON'T KNOW	REFUSED
a.	Decided to not install a cell phone or tablet app because you found out you would have to share personal information in order to use it	51	49	1	*
b.	Uninstalled an app on your cell phone or tablet because you found out it was collecting personal information that you didn't want to share	26	73	*	0
c.	Turned off the location tracking feature on your cell phone or in an app because you were worried about other people or companies being able to access that information	46	52	1	*

Methods

Focus Groups

In collaboration with the Berkman Center for Internet & Society at Harvard, this report includes quotes gathered through a series of exploratory in-person focus group interviews about privacy and digital media, with a focus on social media sites, conducted by the Berkman Center's Youth and Media Project (www.youthandmedia.org) between February and April 2013. The team conducted 24 focus group interviews with a total of 156 participants across the greater Boston area, Los Angeles, Santa Barbara (California), and Greensboro (North Carolina) beginning in February 2013. Each focus group interview lasted 90 minutes, including a 15-minute questionnaire completed prior to starting the interview, consisting of 20 multiple-choice questions and 1 open-ended response.

Although the research sample was not designed to constitute representative cross-sections of particular population(s), the sample includes participants from diverse ethnic, racial and economic backgrounds. Participants ranged in age from 11 to 19. The mean age of participants is 14.5. Groups of three to eight participants were divided into age cohorts of 11-14, 14-16, and 16-19 for interviews. Females comprised 55% of participants, males 41%, and 4% chose not to reply. Half of the focus group participants (50%) were Hispanic, Latino, or of Spanish origin; 33% were white; 13% were black or African-American; 2% were Asian or Asian-American; 1% were American Indian or Alaskan Native; and 1% self-identified as other. Although we tried to assess participants' socioeconomic status based on self-identification of their parents' highest educational achievement, too many participants indicated uncertainty or no knowledge of this to allow for confidence in this metric. However, as we recruited from schools serving students primarily of lower socio-economic status in Los Angeles and Boston, we estimate that at least half of our sample draws from underserved populations.

In addition, two online focus groups of teenagers ages 12-17 were conducted by the Pew Internet Project from June 20-27th, 2012 to help inform the survey design. The first group was with 11 middle schoolers ages 12-14, and the second group was with 9 high schoolers ages 14-17. Each group was mixed gender, with some racial, socio-economic and regional diversity. The groups were conducted as an asynchronous threaded discussion over three days using the Qualboard platform and the participants were asked to log in twice per day. All references to these findings are referred to as "online focus groups" throughout the report.

2012 Teens and Privacy Management Survey

Prepared by Princeton Survey Research Associates International
for the Pew Research Center's Internet and American Life Project

October 2012

SUMMARY

The 2012 Teens and Privacy Management Survey sponsored by the Pew Research Center's Internet and American Life Project obtained telephone interviews with a nationally representative sample of 802 teens aged 12 to 17 years-old and their parents living in the United States. The survey was conducted by Princeton Survey Research Associates International. The interviews were done in English and Spanish by Princeton Data Source, LLC from July 26 to September 30, 2012. Statistical results are weighted to correct known demographic discrepancies. The margin of sampling error for the complete set of weighted data is ±4.5 percentage points.

The Berkman Center at Harvard Law School lead the qualitative data collection effort for this project. Berkman staff (sometimes jointly with the Internet Project) conducted 24 focus group interviews with a total of 137 participants across the greater Boston area, Los Angeles, Santa Barbara, and Greensboro, North Carolina beginning in February 2013. Each focus group interview lasted 90 minutes, including a 15-minute questionnaire completed prior to starting the interview, consisting of 20 multiple-choice questions and 1 open-ended response.

Although the research sample was not designed to constitute representative cross-sections of particular population(s), the sample includes participants from diverse ethnic, racial and economic backgrounds. Participants ranged in age from 11 to 19. The mean age of participants is 14.8. Groups of three to eight participants were divided into age cohorts of 11-14, 14-16, and 16-19 for interviews. Females comprised 58% of participants and males 42%. A majority of participants (54%) were Hispanic, Latino, or of Spanish origin. Of the participants not of Hispanic, Latino or Spanish origin, 66% were white, 27% were African-American or African-American, 2% were Asian or Asian-American, 2% were American Indian or Alaskan Native, 2% self-identified as other, and 1% left the question unanswered. Although we tried to assess participants' socioeconomic status based on self-identification of their parents' highest educational achievement, too many participants indicated uncertainty or no knowledge of this to allow for confidence in this metric. However, as we recruited from schools serving students primarily of lower socio-economic status in Los Angeles and Boston, we estimate that at least half of our sample draws from underserved populations.

Details on the design, execution and analysis of the survey are discussed below.

DESIGN AND DATA COLLECTION PROCEDURES

Sample Design

A combination of landline and cellular random digit dial (RDD) samples was used to represent all teens and their parents in the United States who have access to either a landline or cellular telephone. Both samples were provided by Survey Sampling International, LLC (SSI) according to PSRAI specifications.

Both samples were disproportionately stratified to increase the incidence of African Americans and Latinos. The same stratification scheme was used for both sample frames and was based on the estimated incidence of minority groups at the county level. All counties in the United States were divided into ten strata based on the estimated proportion of African American and Latino populations. Strata with higher minority densities were oversampled relative to strata with lower densities. Phone numbers were drawn with equal probabilities within strata. The disproportionate sample design was accounted for in the weighting.

To supplement the fresh RDD sample, interviews were also completed among a sample of parents who recently participated in the PSRAI Weekly Omnibus survey. Table 1 shows a breakdown of the number of interviews completed by sample segment.

Table 1. Sample Segments

Segment	# of ints.
Fresh RDD landline	267
Fresh RDD cell	134
Callback landline	265
Callback cell	136

Contact Procedures

Interviews were conducted from July 26 to September 30, 2012. As many as 7 attempts were made to contact and interview a parent at every sampled landline telephone number and as many as five attempts were made to contact and interview a parent at every sampled cell number. After the parent interview, an additional 10 calls were made to interview an eligible teen. Sample was released for interviewing in replicates, which are representative subsamples of the larger sample. Using replicates to control the release of sample ensures that complete call procedures are followed for the entire sample. Calls were staggered over times of day and days of the week to maximize the chance of making contact with potential respondents. Each telephone number received at least one daytime call in an attempt to complete an interview.

Contact procedures were slightly different for the landline and cell samples. For the landline samples, interviewers first determined if the household had any 12 to 17 year-old residents. Households with no teens were screened-out as ineligible. In eligible households, interviewers first conducted a short parent interview with either the father/male guardian or mother/female guardian. The short parent interview asked some basic household demographic questions as well as questions about a particular teen in the household (selected at random if more than one teen lived in the house.)

For the cell phone samples, interviews first made sure that respondents were in a safe place to talk and that they were speaking with an adult. Calls made to minors were screened-out as ineligible. If the person was not in a safe place to talk a callback was scheduled. Interviewers then asked if any 12 to 17 year-olds lived in their household. Cases where no teens lived in the household were screened-out as ineligible. If there was an age-eligible teen in the household, the interviewers asked if the person on the cell phone was a parent of the child. Those who were parents went on to complete the parent interview. Those who were not parents were screened-out as ineligible.

For all samples, after the parent interview was complete an interview was completed with the target child. Data was kept only if the child interview was completed.

WEIGHTING AND ANALYSIS

Weighting is generally used in survey analysis to compensate for patterns of nonresponse and disproportionate sample designs that might bias survey estimates. This sample was weighted in three stages. The first stage of weighting corrected for the disproportionate RDD sample designs. For each stratum the variable WT1 was computed as the ratio of the size of the sample frame in the stratum divided by the amount of sample ordered in the stratum. For the callback samples, the weights from the original surveys was brought in and used as WT1.

The second stage of weighting involved correcting for different probabilities of selection based on respondents' phone use patterns. Respondents who have both a landline and a cell phone have a greater chance of being sampled than respondents with access to only one kind of phone. To correct for this we computed a variable called PUA (Phone Use Adjustment). The PUA was computed using the following formula where n1 is the number of respondents having only one kind of phone (landline or cell, but not both) and n2 is the number of respondents have both a landline and a cell phone.

$$PUA = \frac{2(n1 + n2)}{2n1 + n2} \; if \; respondent \; has \; only \; one \; kind \; of \; phone$$

$$PUA = \frac{(n1 + n2)}{2n1 + n2} \; if \; respondent \; has \; both \; kinds \; of \; phone$$

WT1 and PUA were then multiplied together to use as an input weight (WT2) for post-stratification raking

The interviewed sample was raked to match national parameters for both parent and child demographics. The parent demographics used for weighting were: sex; age; education; race; Hispanic origin; number of 12-17 year olds in household; number of adults in the household; phone use and region (U.S. Census definitions). The child demographics used for weighting were gender and age. The parameters came from a special analysis of the Census Bureau's 2011 Annual Social and Economic Supplement (ASEC) that included all households in the United States. The phone use parameter was derived from recent PSRAI survey data.

Raking was accomplished using Sample Balancing, a special iterative sample weighting program that simultaneously balances the distributions of all variables using a statistical technique called the *Deming Algorithm*. Weights were trimmed to prevent individual interviews from having too much influence on the final results. The use of these weights in statistical analysis ensures that the demographic characteristics of the sample closely approximate the demographic characteristics of the national population. Table 2 compares weighted and unweighted sample distributions to population parameters.

Table 2: Sample Demographics

	Parameter	Unweighted	Weighted
Census Region			
Northeast	17.8	13.8	17.1
Midwest	22.2	21.2	21.0
South	36.0	36.9	36.8
West	24.0	28.1	25.1
Parent's Sex			
Male	43.3	35.5	41.2
Female	56.7	64.5	58.8
Parent's Age			
LT 35	10.3	6.5	9.9
35-39	18.1	12.7	17.7
40-44	25.6	21.4	24.6
45-49	24.4	24.2	25.0
50-54	14.6	21.1	15.0
55+	7.1	14.2	7.8
Parent's Education			
Less than HS grad.	12.7	6.4	11.7
HS grad.	33.5	24.2	31.8
Some college	23.3	24.0	24.2
College grad.	30.5	45.4	32.2
Parent's Race/Ethnicity			
White~Hispanic	63.0	68.0	63.3
Black~Hispanic	11.2	15.3	12.0
Hispanic, native born	6.7	4.5	6.4
Hispanic, foreign born	12.5	7.0	11.8
Other~Hispanic	6.5	5.1	6.6
Parent's Phone Use			
Landline only	7.8	6.7	8.0
Dual Users	59.8	78.4	62.4
Cell Phone only	33.1	14.8	29.6
# of 12-17 Kids in HH			
One	70.2	64.5	69.0
Two	25.2	27.4	25.9
Three+	4.6	8.1	5.1
# of adults in HH			
One	10.5	13.0	11.5
Two	58.6	58.6	57.7
Three+	30.9	28.4	30.8

(Continued…)

Table 2: Sample Demographics (continued)

	Parameter	Unweighted	Weighted
Kid's Sex			
Male	51.3	50.5	51.0
Female	48.7	49.5	49.0
Kid's Age			
12	16.7	14.1	15.6
13	16.7	16.6	17.1
14	16.7	15.6	16.0
15	16.7	16.8	17.3
16	16.7	19.3	17.4
17	16.7	17.6	16.6

Effects of Sample Design on Statistical Inference

Post-data collection statistical adjustments require analysis procedures that reflect departures from simple random sampling. PSRAI calculates the effects of these design features so that an appropriate adjustment can be incorporated into tests of statistical significance when using these data. The so-called "design effect" or *deff* represents the loss in statistical efficiency that results from systematic non-response. The total sample design effect for this survey is 1.69.

PSRAI calculates the composite design effect for a sample of size *n*, with each case having a weight, w_i as:

$$deff = \frac{n\sum_{i=1}^{n} w_i^2}{\left(\sum_{i=1}^{n} w_i\right)^2} \qquad \textit{formula 1}$$

In a wide range of situations, the adjusted *standard error* of a statistic should be calculated by multiplying the usual formula by the square root of the design effect ($\sqrt{deff}$). Thus, the formula for computing the 95% confidence interval around a percentage is:

$$\hat{p} \pm \left(\sqrt{deff} \times 1.96 \sqrt{\frac{\hat{p}(1-\hat{p})}{n}} \right) \qquad \textit{formula 2}$$

where $\hat{p}$ is the sample estimate and *n* is the unweighted number of sample cases in the group being considered.

The survey's *margin of error* is the largest 95% confidence interval for any estimated proportion based on the total sample— the one around 50%. For example, the margin of error for the entire sample is ±4.5 percentage points. This means that in 95 out every 100 samples drawn using the same methodology, estimated proportions based on the entire sample will be no more than 4.5 percentage points away from their true values in the population. It is important to remember that sampling fluctuations are only one possible source of error in a survey estimate. Other sources, such as respondent selection bias, questionnaire wording and reporting inaccuracy, may contribute additional error of greater or lesser magnitude.

Response Rate

Table 3 reports the disposition of all sampled callback telephone numbers ever dialed. The response rate is calculated according to American Association of Public Opinion Research standards.

Table 3:Sample Disposition

Landline Fresh RDD	Cell Fresh RDD	LL Callback	Cell Callback	
267	134	265	136	I=Completes
17	9	9	10	R=Refusal known to be eligible
11197	14226	501	448	UO_R=Refusal eligibility status unknown
4733	8666	56	63	NC=Non contact known working number
211	108	2	3	O=Other
54721	17757	126	98	OF=Business/computer/not working/child's cell phone
4960	1043	10	1	$UHUO_{NC}$=Non-contact - unknown household/unknown other
3383	3475	89	101	SO=Screenout
0.31	0.61	0.88	0.89	e1=(I+R+UO_R+NC+O+SO)/(I+R+UO_R+NC+O+SO+OF) - Assumed working rate of non-contacts
0.08	0.04	0.75	0.59	e2=(I+R)/(I+R+SO) - Assumed eligibility of unscreened contacts
16.1%	**12.4%**	**37.7%**	**30.2%**	**AAPOR RR3=I/[I+R+[e2*(UOR+NC+O)]+[e1*e2*$UHUO_{NC}$]]**