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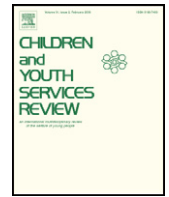
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# Children and Youth Services Review

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## Are social networking sites a source of online harassment for teens? Evidence from survey data

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### ABSTRACT

Media reports on incidences of abuse on the internet, particularly among teenagers, are growing at an alarming rate causing much concern among parents of teenagers and prompting legislations aimed at regulating internet use among teenagers. Social networking sites (SNS) have been criticized for serving as a breeding ground for cyber-bullying and harassment by strangers. However, there is a lack of serious research studies that explicitly identify factors that make teenagers prone to internet abuse, and study whether it is SNS that is causing this recent rise in online abuse or is it something else. This study attempts to identify the key factors associated with cyber-bullying and online harassment of teenagers in the United States using the 2006 round of Pew Internet™ American Life Survey that is uniquely suited for this study. Results fail to corroborate the claim that having social networking site memberships is a strong predictor of online abuse of teenagers. Instead this study finds that demographic and behavioral characteristics of teenagers are stronger predictors of online abuse.

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### 1. Introduction

Media reports on incidences of abuse on the internet, particularly among teenagers, are growing at an alarming rate (Goodstein, 2007). A recent video of a Florida teenager being beaten, posted on YouTube,<sup>1</sup> created uproar and a renewed call for assessment of unmonitored use of the internet by teenagers. A Pew Internet survey reported that one in three teenagers experience some form of cyber-bullying and typically more frequent victims are girls. Cyber-bullying or internet abuse takes the form of unwarranted contact by strangers, distortion of photographs, posting distorted information, and even coercive actions like sending threatening or aggressive messages online (Slonje & Smith, 2008). These incidents have been on an upward swing causing much concern among parents of teenagers and prompting state-level legislations aimed at regulating internet use among teenagers (Thierer, 2007).

Internet use, particularly the use of chat rooms and instant messaging can be addictive (Becker & Murphy, 1988) and risky if teenagers indiscreetly divulge private information, indulge in inappropriate behaviors, and encourage contact with strangers. Scholars have found correlations between internet use and online harassment and sexual abuse of youth and teenagers (Finkelhor, Kimberly, & Wolak,

2000; Ybarra & Mitchell, 2008). Finkelhor et al. (2000) conducted a survey on the internet use of representative youth aged 10 to 17 years in the United States and found that one in five youth were exposed to sexual solicitation, one in seventeen were harassed or threatened and only a fraction reported these cases while more than 63% reported being upset, embarrassed or stressed as a result of these unwanted contacts. Abuse on the internet creates emotional distress, psychosocial trauma and has serious mental health consequences for teenagers (Ybarra, Mitchell, Wolak, & Finkelhor, 2006; Wolak, Mitchell, & Finkelhor, 2006). To protect teenagers from being bullied and abused in the cyberspace, there have been calls for restrictions on youth access of the internet with the hope that such restrictions may reduce the intensity of risky behaviors. In some cases, harsher consequences have been introduced to dissuade bullying and harassment of teenagers by peers and strangers. For example, the state of California enacted a new law in 2009 based on AB 86 that added cyber-bullying to school disciplinary codes and gives school officials the authority to suspend or expel students for bullying fellow students electronically.

Internet technology has provided social networking sites (SNS) like MySpace, Facebook, Orkut, LinkedIn and others in addition to instant messaging and online chat rooms as means to contact friends, acquaintances and socialize over the internet. SNS have become increasingly popular among teenagers (Mishna, Saini, & Solomon, 2009) and are also potential vehicles for adolescents to engage in risky and destructive behaviors (Duncan, 2008). SNS have been particularly blamed as a source of harassment for teenage internet users and for the recent increase in teen abuse (Thierer, 2007) making a case for restricting teen access to social networking sites. However, there is no

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<sup>1</sup> Report: Teen beaten in youtube attack to be homeschooled, Wednesday, April 09, 2008, <http://www.foxnews.com/story/0,2933,348908,00.html>.

consensus that SNS leads to greater harassment or abuse of teenagers and studies that have explicitly measured this correlation have not been able to determine whether SNS sites are to be blamed solely, or that it is a result of use of different types of online technology as well as teen attitudes and behaviors (Ybarra & Mitchell, 2008; National School Boards, 2007). Critics have thus blamed the media for alarmist coverage (Goodstein, 2007) on the impact of SNS on teen abuse.

Although the cost of networking on SNS may be incidences of harassment, there are also tangible benefits of online social interactions. It is difficult to establish causal effects of social networking on incidences of online harassment because there may be unobservable characteristics that may predispose certain teenagers to specific types of harassment online. Use of SNS is a fairly recent phenomenon and lack of longitudinal data makes it difficult to establish causality between use of SNS and rise in online harassment. Some researchers have suggested the need for investing in virtual outreach to help teens that are more prone to internet abuse (Ybarra & Mitchell, 2008).

What is completely lacking in this literature is a study that systematically examines the demographic and behavioral characteristics of teenage internet users, and other factors that may potentially increase their likelihood of being victims of online abuse. This would help determine the youth most at risk and also identify the key intervention for prevention of such abuse. Our study fills this gap by studying the characteristics of teenagers, their environmental and parental characteristics that are correlated with their likelihood of becoming victims of online abuse. We examine whether it is having SNS site memberships or the nature of internet use that results in incidences of cyber-bullying and online harassment for teenagers in the United States. Although researchers have established that parental characteristics are highly correlated to youth behaviors and outcomes (Painter & Levine, 2000), there is a limited understanding of the relationship between parental characteristics and controls and teen abuse on the internet. Using parental background information, we seek to shed light on the relationship between parental characteristics and teen abuse on the internet.

We use a unique data collected by Pew Internet™ American Life Survey that tracks internet usage of individual households. A component of this survey is the Teen Online Survey that was most recently conducted between October and November 2006. It tracks activities of teens on the internet and asks participants questions that help to identify whether a teen was abused, bullied or approached by strangers through the virtual medium. The survey also collects household demographic information that allows us to track education levels and internet use among parents of teen respondents.

This study, therefore, fills important gaps in the existing literature by examining the following four questions: First, what kinds of teenagers are most likely to have SNS access? Second, does SNS access increase the likelihood of being cyber-bullied or harassed? Third, what kind of teenage characteristics and behaviors make them most prone to online abuse? Finally, what is the impact of parental characteristics and parental controls on teen online abuse? The study thus has important policy implications. It systematically identifies predictors of risky online behaviors of teens that can help policy-makers and health professionals identify the most vulnerable teens and target interventions to prevent potential harassment and consequences that are likely to be faced by these teenagers.

## 2. Methodology

### 2.1. Data and variables

We use data from Pew Internet™ American Life Survey's Online Teen Survey, conducted in October and November 2006. The survey asked a variety of questions to both parents and their teenage children on their online awareness and activities. This nationally representative survey collected data from 935 teens in the age bracket of 12 to 17

belonging to the census regions of North-east, Mid-west, South and West. In particular, the survey focused primarily on the social networking activities of the teens on the internet and parents' awareness of their children's online activity. It also tracked parent's monitoring of their teenage children's internet activities. Most importantly, the survey collected information on whether the teens have been contacted by strangers online or have been bullied in any form, including whether they had rumors spread about them, embarrassing pictures posted online or received threatening messages.

For the purposes of this study, teen internet abuse can be of two types: cyber-bullying and online harassment. Cyber-bullying is a categorical variable that is 1 (0 otherwise) if the teenager has experienced bullying in the form of rumor spreading, receiving threats, embarrassing information posted about them, and forwarding private messages. Online harassment is defined as a categorical variable with a value of 1 (0 otherwise) if a teenager has been either bullied or contacted by a total stranger (not known to the teen or their friends) online.

Incidences of online abuse may depend on a variety of factors. We take into consideration whether a teen has an online profile on sites such as MySpace or Facebook and whether these profiles are protected, i.e., only visible to friends. Teens who visit SNS more frequently are more likely to be exposed to online abuse hence we consider the frequency of such, very high to extremely low, visits to SNS. An important factor that may expose teens to online abuse is the ease of access that the teen has to SNS and the frequency with which they access the internet. Teenagers can access the internet from home, school, workplace, libraries, friend's houses or other places, but are more likely to spend time at home surfing the internet. Therefore, whether the teen has access to the internet at home is considered as a determinant of online abuse.

One of the key determinants that may result in internet abuse is the online behavior of teen users and the information they disclose in their online profile. This primarily consists of their personal information (name, address, school name, city and state, cell or home phone number, and instant messenger id) and pictures of themselves or their friends. We use these online behaviors to determine the relative importance of these behavioral characteristics on the incidences of teen abuse. Flirtatious activities and display of fake information may encourage stranger contacts or other forms of harassment. Hence, other determinants of online abuse include whether teens display fake information on their profiles, whether they use online chat rooms, and whether they occasionally use SNS or chat rooms to 'flirt'.

Since teenagers spend significant time surfing the internet at home, there has been much discussion of whether parents should place computers in a more public space in the home, install monitoring systems to prevent their children from visiting adult sites and track their child's online behavior. To test if monitoring teen behavior makes a difference, we control for whether the teen uses internet privately (example, in bedroom) or whether parents monitor their children's internet use (by using monitoring or filtering software or by checking the history of sites visited).

Besides these key variables, we examine the influence of other demographic characteristics such as age, race, gender and household income on the likelihood of internet abuse. Family environment, such as parents' marital status (married or otherwise) that can influence teen behavior in the household is examined as an additional factor. We also add categorical variables indicating broad geographical regions such as north-east, west, mid-west and south to control for geographical differences in the use of the internet.

### 2.2. Estimation

We estimate three different models using logistic regression analysis. All estimations use sampling weights to generate nationally

representative estimates. To examine the association between teens' SNS memberships and incidence of online harassment, we employ a two-stage estimation process. Not all teens have an SNS site membership (only 53% of teens report having an SNS membership). Also, we are interested in understanding the determinants of who are likely to have SNS access. Hence, in the first stage (*Model 1*), we examine the determinants of having access to SNS. We are also interested in determining who will experience abuse conditional on having SNS access. Therefore, in the second stage (*Model 2*), using a truncated logit analysis, we examine the factors that increase the likelihood of being abused conditional on having SNS access. We examine two kinds of online abuse: cyber-bullying as well as online harassment.

**Model 1 (pooled):**

$$\text{Likelihood (SNS membership)} = \alpha + \beta_1 TC + \beta_2 TU + \beta_3 TB + \beta_4 PC + \beta_5 \text{Race} + \beta_6 \text{Inc} + \beta_7 \text{Reg}$$

**Model 2a (truncated model conditional on having SNS membership):**

$$\text{Likelihood (online harass)} = \alpha + \beta_1 TC + \beta_2 TU + \beta_3 TB + \beta_4 PC + \beta_5 \text{Race} + \beta_6 \text{Inc} + \beta_7 \text{Reg}$$

**Model 2b (truncated model conditional on having SNS membership):**

$$\text{Likelihood (cyber-bullied)} = \alpha + \beta_1 TC + \beta_2 TU + \beta_3 TB + \beta_4 PC + \beta_5 \text{Race} + \beta_6 \text{Inc} + \beta_7 \text{Reg}$$

where *TC* represents teen characteristics, *TU* is frequency of teen internet use, *TB* is teen online behavior, *PC* is parent characteristics, *Inc* is income, and *Reg* is geographic region.

In addition, we also do a pooled analysis (*Model 3*) to determine if having an SNS website is correlated with an increase in the likelihood of online harassment or cyber-bullying for all teens, controlling for all other characteristics. In *Model 3*, the covariates of interest are SNS membership (*SNS*) and the related online behaviors of teens.

**Model 3a (Pooled)**

$$\text{Likelihood (online harass)} = \alpha + \beta_1 TC + \beta_2 TU + \beta_3 TB + \beta_4 PC + \beta_5 \text{Race} + \beta_6 \text{Inc} + \beta_7 \text{Reg} + \beta_8 \text{SNS}$$

**Model 3b (Pooled)**

$$\text{Likelihood (cyber-bullying)} = \alpha + \beta_1 TC + \beta_2 TU + \beta_3 TB + \beta_4 PC + \beta_5 \text{Race} + \beta_6 \text{Inc} + \beta_7 \text{Reg} + \beta_8 \text{SNS}$$

### 3. Results

#### 3.1. Data summary

**Table 1** summarizes the data used for this analysis. The data is well represented nationally in terms of census regions, teenager's age and gender. There is a slight over-representation of whites in the survey. Teens in the different age brackets, 12 to 17 are adequately represented. More than half the teens have an SNS profile and almost a third of all surveyed are frequent internet users, accessing the internet several times a day. Almost 80% of the teens interviewed have married parents while 56% used computers which had a monitoring device installed.

**Fig. 1** is a graphical representation of the proportion of teenagers that have had some kind of negative internet encounter. Of the total population, 30% has been contacted by strangers and more than 25% has faced some kind of cyber-bullying. Looking at those who have SNS profiles, the proportion of teenagers contacted by strangers (45%) or having been cyber-bullied (40%) is higher. This bivariate distribution may suggest that SNS creates a higher risk of online abuse but multivariate analysis is necessary to draw a true picture.

**Table 1**  
Descriptive summary statistics.

Descriptive variables	Obs.	Mean	Std. dev.	Min	Max
Female	935	0.50	0.50	0	1
Teen's age	935	14.66	1.70	12	17
Teen's age group					
Age 12	935	0.15	0.36	0	1
Age 13	935	0.14	0.35	0	1
Age 14	935	0.17	0.37	0	1
Age 15	935	0.16	0.37	0	1
Age 16	935	0.20	0.40	0	1
Age 17	935	0.18	0.39	0	1
Race					
White	935	0.88	0.32	0	1
Black	935	0.07	0.26	0	1
Others	935	0.05	0.21	0	1
Frequency of internet usage					
High	935	0.34	0.48	0	1
Moderate	935	0.26	0.44	0	1
Low	935	0.17	0.37	0	1
Very low	935	0.09	0.29	0	1
Rare	935	0.14	0.35	0	1
Type of internet usage					
Have profile on a social networking site	935	0.53	0.50	0	1
Chat online	935	0.17	0.37	0	1
Involved in extra-curricular activities	935	0.87	0.34	0	1
Work part-time	935	0.23	0.42	0	1
Use computer in a private area (bedroom)	935	0.23	0.42	0	1
Information disclosed online					
Disclose name	935	0.48	0.50	0	1
Disclose school	935	0.71	0.45	0	1
Disclose cell phone number	935	0.29	0.46	0	1
Disclose home address	935	0.20	0.40	0	1
Disclose instant messaging ID	935	0.51	0.50	0	1
Disclose e-mail ID	935	0.44	0.50	0	1
Disclose other private information	935	0.86	0.35	0	1
Internet encounters					
Rumor spread	935	0.11	0.32	0	1
Embarrassing picture posted	935	0.06	0.23	0	1
Contacted by stranger	935	0.31	0.46	0	1
Received threatening or aggressive e-mail	935	0.11	0.31	0	1
Took private e-mail/IM/text message from a forward	935	0.13	0.34	0	1
Cyber-bullied	935	0.29	0.45	0	1
Parental characteristics					
Less than high school	935	0.01	0.10	0	1
High school graduate	935	0.29	0.45	0	1
College graduate or higher	935	0.70	0.46	0	1
Married	935	0.79	0.41	0	1
Monitor devices installed on computer	935	0.62	0.49	0	1
Household income					
0–\$40,000	935	0.21	0.41	0	1
\$40,001–\$99,999	935	0.47	0.50	0	1
\$100,000 and higher	935	0.22	0.41	0	1
Unknown	935	0.10	0.30	0	1
Census regions					
North-east	935	0.20	0.40	0	1
Mid-west	935	0.28	0.45	0	1
South	935	0.31	0.46	0	1
West	935	0.20	0.40	0	1

#### 3.2. Determinants of SNS profile

**Table 2** presents results for model 1 that examines the characteristics of teenagers who are likely to have SNS access. Results suggest that female teens are 63% more likely than male teens to set up a profile on one of the many available social networking sites. Also, teens in higher age groups have a much higher likelihood of having an SNS profile. The results also suggest that the likelihood of teens having an SNS profile is strongly associated with the frequency of internet usage. Higher frequency of internet usage, either from home, school, workplace or libraries is associated with a higher likelihood of having SNS profiles. Teens who access the internet once a day are 51% less likely to have an SNS profile than teens that access the internet several

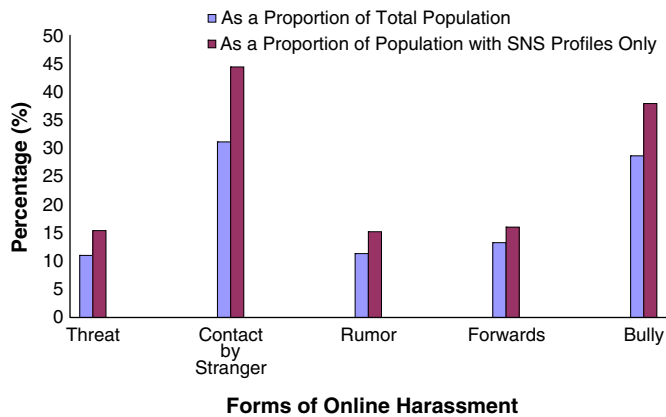


Fig. 1. Different types of online harassment faced by teens.

times a day. Contrary to anecdotal evidence, teenagers who use the internet privately at home do not have a significantly higher likelihood of having an SNS profile. Doing part-time jobs or extra-curricular activities is not significantly associated with having SNS profiles. Further, teens living in western and southern United States are more likely to have SNS compared to those living in the east or the mid-west.

Teens with married parents are 37% less likely to have an SNS membership than teens of divorced or single parents. This suggests (and corroborates with other findings) that teens of divorced or single parents may spend more time unsupervised or face an environment that induces riskier behaviors such as seeking a social circle on the internet and contact with strangers. Other parental characteristics such as income and education are not significant determinants of teenagers' likelihood of having SNS access.

### 3.3. Determinants of online harassment

Table 3 contains results for models 2a and 3a with estimates of correlates of online harassment. Column 1 in Table 3 presents pooled estimation results (model 3a). Female teens are more than 250% more likely to be harassed online than male teens. This is consistent with media reports that suggest that female teenagers are more prone to online bullying and unwanted stranger contact. Lower frequency of use reduces the likelihood of being harassed. Disclosure of private information, primarily disclosing instant messenger id, disclosing school information and uploading picture of oneself on SNS attracts unsolicited contacts or other forms of aggressive behavior from strangers and others. Teenagers who use SNS as a platform to flirt are 300% more likely of being harassed online in comparison to those who do not use SNS for flirtatious activities. Teenagers whose parents monitor their online activity seem to have a higher likelihood of being harassed. Though this finding may appear to be intuitively contradictory, it is entirely possible that greater harassment warrants greater monitoring.

Teenagers who have part-time jobs are more likely to be harassed online. It is possible that teens who have part-time jobs may possibly be using the internet for their social networking needs and may be more prone to facing online harassment. It may also mean that there may be unobservable factors that make teens work part-time as well as make them prone to online harassment. Hence, part-time work may be a potentially endogenous variable that needs to be corrected using instrumental variable estimation. Since this is not the main focus of the paper, we plan to address this interesting finding in our future work.

Column 2 in Table 3 contains results of determinants of online harassment conditional on teens' having SNS access (model 2a). Results are similar to the pooled case though in addition we observe that teenagers who have extra-curricular activities and have SNS

Table 2  
Determinants of having an SNS profile.

	Teen has an SNS profile
Female	1.6299*** (0.29)
Have a computer at home (teens)	1.0523 (0.26)
Teen's age (omitted category: age 12)	
Age 13	1.5488 (0.50)
Age 14	2.1899** (0.67)
Age 15	2.3366*** (0.76)
Age 16	2.2387*** (0.68)
Age 17	2.4226*** (0.77)
Frequency of internet usage (omitted category: high)	
Moderate	0.5142*** (0.12)
Low	0.2991*** (0.08)
Very low	0.2216*** (0.08)
Rare	0.0882*** (0.03)
Other teen characteristics	
Use internet privately	0.9312 (0.19)
Work part-time	1.3579 (0.30)
Involved in extra-curricular activities	1.0613 (0.26)
Race (omitted category: white)	
Black	0.6574 (0.24)
Other	1.2482 (0.48)
Parents' education and other characteristics (education omitted category: college and higher)	
Some school	0.696 (0.65)
High school	0.9877 (0.20)
Married	0.3764*** (0.10)
Monitor devices installed on computers	1.0801 (0.20)
Household income brackets (omitted category: 0–\$40,000)	
\$40,001–\$99,999	1.2959 (0.34)
\$100,000 and higher	1.1803 (0.36)
Unknown income bracket	0.7384 (0.26)
Census regions (omitted category: north-east)	
Mid-west	1.3804 (0.34)
South	1.9216*** (0.45)
West	2.4387*** (0.64)
Observations	935

Notes: odds ratios are reported (robust standard errors in parentheses).

\*\* 5% significance level.

\*\*\* 1% significance level.

memberships are less likely to be harassed online. This may suggest that these teens may be spending less time on SNS, lowering their potential for harassment. Teens of more educated parents were found to be less likely to face online harassment. However, monitoring teenagers' computer use had no significant association with likelihood of being harassed for those who were accessing SNS.



**Table 3**  
Who is likely to be harassed on the internet?

	Harassed online	Harassed online and has an SNS profile
Female	2.4195*** (0.49)	2.6077*** (0.65)
Have a computer at home (teens)	1.0175 (0.27)	1.4626 (0.51)
Teen's age (omitted category: age 12)		
Age 13	1.0392 (0.37)	0.5188 (0.29)
Age 14	0.8844 (0.31)	0.4361 (0.23)
Age 15	1.0552 (0.36)	0.546 (0.29)
Age 16	1.0905 (0.36)	0.7694 (0.43)
Age 17	1.1756 (0.41)	0.4082* (0.22)
Frequency of internet usage (omitted category: high)		
Moderate	0.8511 (0.20)	1.0026 (0.30)
Low	0.6219* (0.18)	0.6869 (0.26)
Very low	0.3781*** (0.13)	0.3701** (0.18)
Rare	0.2862*** (0.10)	1.0112 (0.58)
Race (omitted category: white)		
Black	1.0099 (0.33)	1.173 (0.54)
Other	1.9726* (0.75)	1.8365 (1.01)
Other teen characteristics		
Have an SNS profile	1.57 (0.46)	
Chat online	2.2811*** (0.57)	1.9941** (0.63)
Involved in extra-curricular activities	0.9094 (0.20)	0.4779** (0.16)
Work part-time	2.0105*** (0.43)	2.0829** (0.63)
Use internet privately	1.334 (0.29)	1.3705 (0.40)
Parents' education and other characteristics (education omitted category: college and higher)		
Some school	0.4709 (0.29)	1.7519 (1.51)
High school	0.8116 (0.16)	0.4716*** (0.12)
Married	1.0137 (0.26)	1.0531 (0.32)
Monitor devices installed on computers	1.5487** (0.30)	1.2271 (0.33)
Household income brackets (omitted category: 0–\$40,000)		
\$40,001–\$99,999	0.9878 (0.26)	1.2005 (0.39)
\$100,000 and higher	0.8897 (0.28)	1.024 (0.42)
Unknown income bracket	0.7212 (0.25)	1.2242 (0.62)
Information disclosed on SNS profile		
Name	0.947 (0.18)	0.7173 (0.18)
School	1.5845** (0.35)	2.4132*** (0.65)
Cell phone number	1.1395 (0.27)	0.8317 (0.23)
Home address	1.2641 (0.31)	1.211 (0.42)
Instant messaging ID	1.8919*** (0.39)	1.6577* (0.49)
E-mail ID	1.0582 (0.21)	1.1269 (0.30)

**Table 3 (continued)**

	Harassed online	Harassed online and has an SNS profile
Information disclosed on SNS profile		
Other private information	1.1265 (0.32)	1.6975 (0.63)
Other characteristics on SNS profile		
Post picture of self	2.4564*** (0.66)	3.3431*** (1.01)
Profile is password protected	0.8988 (0.21)	0.9244 (0.22)
Use a false ID	0.8197 (0.18)	0.8747 (0.22)
Use SNS to flirt with others	3.4631*** (1.24)	4.0652*** (1.49)
Frequent with social interactions	0.5812** (0.15)	0.5421** (0.15)
Census regions (omitted category: north-east)		
Mid-west	1.1534 (0.29)	1.4453 (0.52)
South	0.9888 (0.25)	0.9626 (0.33)
West	1.577 (0.45)	1.5649 (0.64)
Observations	935	493

Notes: odds ratios are reported (robust standard errors in parentheses).

\* 10% significance level.

\*\* 5% significance level.

\*\*\* 1% significance level.

### 3.4. Determinants of cyber-bullying

Table 4 reports estimation results of models 2b and 3b. Column 1 in Table 4 presents odds ratios of covariates that are correlated with cyber-bullying for the pooled sample (model 3b). Column 2 contains results for the truncated sample conditional on having an SNS membership (model 2b). Results indicate that having access to SNS is not a predictor of cyber-bullying. Instead, being female, posting pictures online, chatting online, disclosing school information and instant messaging ID, doing part-time work, and flirting online are strongly associated with the likelihood of being cyber-bullied. Conditional on having SNS membership, teenagers who are engaged in extra-curricular activities and older teens are less likely to be bullied online. Parental characteristics are not significantly correlated with teenagers likely to be cyber-bullied. However, using the internet privately, away from parents' watchful eyes, is associated with a 60% higher likelihood of being cyber-bullied, consistent with prior studies and reports.

### 3.5. Sensitivity analysis

To see if our results hold up in different specifications, we tried several variations to the basic model. These results are not reported but available on request. We looked at a stricter definition of online harassment that includes cyber-bullying and unwanted stranger contact and found similar results. Likelihood of female teenagers to face cyber-bullying and unwanted stranger contact is much stronger. We also introduced interaction terms to check if children of single parents are left unsupervised more and hence more likely to be harassed or bullied. Although the results indicate that children of married parents who access internet at home are less likely to be bullied or harassed, they are not statistically significant.

## 4. Discussion and policy implications

It is commonly believed that social networking sites serve as a hub for sex offenders and cyber-bullies. This study, based on survey data of teens in the age bracket of 12 to 17 years fails to establish a strong empirical support to this widely held belief. This study rather finds

**Table 4**  
Who is likely to be bullied on the internet?

	Bullied online	Bullied online and has an SNS profile
Female	1.9582*** (0.41)	1.9363*** (0.48)
Have a computer at home (teens)	0.8719 (0.23)	1.1333 (0.41)
Teen's age (omitted category: age 12)		
Age 13	1.315 (0.48)	0.604 (0.34)
Age 14	1.0939 (0.38)	0.4346* (0.21)
Age 15	1.229 (0.43)	0.5297 (0.26)
Age 16	0.7266 (0.25)	0.3027** (0.15)
Age 17	0.7766 (0.29)	0.2464*** (0.12)
Frequency of internet usage (omitted category: high)		
Moderate	0.5702** (0.14)	0.5695* (0.16)
Low	0.6642 (0.20)	0.7278 (0.30)
Very low	0.4862** (0.17)	0.5645 (0.30)
Rare	0.2454*** (0.10)	0.9598 (0.56)
Race (omitted category: white)		
Black	1.2212 (0.43)	1.8323 (0.84)
Other	1.7592 (0.66)	1.4376 (0.74)
Other teen characteristics		
Have an SNS profile	1.1245 (0.34)	
Chat online	1.8194** (0.43)	1.8272** (0.52)
Involved in extra-curricular activities	0.8873 (0.22)	0.4243** (0.15)
Work part-time	1.7757** (0.40)	1.9955** (0.57)
Use internet privately	1.1286 (0.25)	1.5537* (0.42)
Parents' education and other characteristics (education omitted category: college and higher)		
Some school	1.2367 (0.97)	4.0512 (4.68)
High school	1.3441 (0.27)	0.8631 (0.21)
Married	1.026 (0.29)	1.1541 (0.36)
Monitor devices installed on computers	1.2607 (0.26)	1.1724 (0.30)
Household income brackets (omitted category: 0–\$40,000)		
\$40,001–\$99,999	1.0599 (0.29)	1.0113 (0.34)
\$100,000 and higher	1.2176 (0.39)	1.3693 (0.56)
Unknown income bracket	1.0213 (0.36)	1.0512 (0.49)
Information disclosed on SNS profile		
Name	1.0141 (0.20)	1.0315 (0.26)
School	1.6520** (0.39)	2.0809*** (0.58)
Cell phone number	1.267 (0.29)	1.0697 (0.29)
Home address	1.0119 (0.27)	0.9544 (0.33)
Instant messaging ID	1.6420** (0.36)	1.3926 (0.39)
E-mail ID	1.0059 (0.21)	0.8465 (0.23)
Other private information	1.0971 (0.35)	1.5369 (0.58)

**Table 4** (continued)

	Bullied online	Bullied online and has an SNS profile
Other characteristics on SNS profile		
Post picture of self	1.255 (0.34)	1.9332** (0.63)
Profile is password protected	1.2451 (0.28)	1.2043 (0.29)
Use a false ID	1.1435 (0.26)	1.3738 (0.34)
Use SNS to flirt with others	2.3198** (0.78)	2.3754*** (0.77)
Frequent with social interactions	0.7712 (0.20)	0.7531 (0.21)
Census regions (omitted category: north-east)		
Mid-west	1.1247 (0.29)	0.9171 (0.32)
South	1.1912 (0.30)	0.9794 (0.33)
West	1.2489 (0.37)	0.9379 (0.36)
Observations	935	493

Notes: odds ratios are reported (robust standard errors in parentheses).

\* 10% significance level.

\*\* 5% significance level.

\*\*\* 1% significance level.

support for the view that online attitudes and behaviors of teens, including the amount of information they disclose in the public domain, the way they use the internet (privately or publicly) and the manner in which they interact with people online play a key role in determining whether they eventually become victims to online harassment and cyber-bullying. Uploading pictures of themselves accessible to all users, disclosing information about the school they attend or home phone number and instant messenger id, flirting with unknown people, visiting online chat rooms and privately accessing the internet are all key to unsolicited stranger contacts or being bullied online. Further, female teenagers are particularly vulnerable to online harassment. Simply having a profile on SNS does not imply a higher likelihood of facing online harassment, unlike what has been repeatedly reported earlier.

The results suggest that teens that use their computers privately and away from their parent's watchful eyes are more likely to be bullied. Installing a monitoring system in the computers does not seem to have any significant association with the likelihood of being harassed or bullied for those who access SNS. These results emphasize the importance of parents' interaction with their teenage children. Installing monitoring software or devices may not be as crucial as is discussing with their children the potential dangers associated with using the internet.

This study has important policy implications related to teen access to the internet and SNS. Instead of restricting access to SNS, teen abuse on the internet can be prevented through creating greater awareness and targeting the root of the problem. Results suggest that outreach programs, to make teens aware of the harmful consequences of risky online behavior, would be a better way to reduce online harassment than limiting teen access to SNS and online chat rooms. Moreover, parental guidance and parental controls can help teenagers learn the appropriate use of the internet and protect themselves from unwarranted and unpalatable contact from strangers. Educated guidance can minimize disclosure of critical information and ensure appropriate social interaction in the public domain and thus avoid any adverse consequences.

## References

Becker, G. S., & Murphy, K. M. (1988). A theory of rational addiction. *Journal of Political Economy*, 96, 675–700.

- Duncan, S. (2008). MySpace is also their space: Ideas for keeping children safe from sexual predators on social-networking sites. University of Louisville School of Law Legal Studies Research Paper Series No. 2008-13. *Kentucky Law Journal*, 96.
- Goodstein, A. (2007). Dangers Overblown for Teens Using Social Media, June 4, 2007, Retrieved from [http://www.pbs.org/mediashift/2007/06/fear\\_factor\\_dangers\\_overblown\\_f.html](http://www.pbs.org/mediashift/2007/06/fear_factor_dangers_overblown_f.html)
- Finkelhor, D., Kimberly, J. M., & Wolak, J. (2000). *Online victimization: A report on the nation's youth*. Arlington, VA: National Center for Missing & Exploited Children.
- Mishna, F., Saini, M., & Solomon, S. (2009). Ongoing and online: Children and youth's perception of cyber-bullying. *Children and Youth Services Review*, 31, 1222–1228.
- National School Boards Association (2007). *Creating and Connecting, Research and Guidelines on Online Social and Educational Networking*.
- Painter, G., & Levine, D. I. (2000). Family structure and youths' outcomes. *Journal of Human Resources*, 35, 524–549.
- Slonje, R., & Smith, P. K. (2008). Cyberbullying: Another main type of bullying? *Scandinavian Journal of Psychology*, 49, 147–154.
- Thierer, A. (2007). *Social networking and age verification: Many hard questions; no easy solutions, March 21, 2007*. Progress & Freedom Foundation Progress on Point Paper No. 14.5.
- Wolak, J., Mitchell, K., & Finkelhor, D. (2006). *Online victimization of youth: 5 years later*. National center for Missing and Exploited Children Bulletin #07-06-025.
- Ybarra, M., & Mitchell, K. (2008). How risky are social networking sites? A comparison of places online where youth sexual solicitation and harassment occurs. *Pediatrics*, 121, e350–e357.
- Ybarra, M., Mitchell, K., Wolak, J., & Finkelhor, D. (2006). Examining characteristics and associated distress related to internet harassment: Findings from the Second Youth Internet Safety Survey. *Pediatrics*, 118, e1169–e1177.