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ARTICLE

How Risky Are Social Networking Sites? A Comparison of Places Online Where Youth Sexual Solicitation and Harassment Occurs

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ABSTRACT

OBJECTIVE. Recently, public attention has focused on the possibility that social networking sites such as MySpace and Facebook are being widely used to sexually solicit underage youth, consequently increasing their vulnerability to sexual victimization. Beyond anecdotal accounts, however, whether victimization is more commonly reported in social networking sites is unknown.

PARTICIPANTS AND METHODS. The Growing up With Media Survey is a national cross-sectional online survey of 1588 youth. Participants were 10- to 15-year-old youth who have used the Internet at least once in the last 6 months. The main outcome measures were unwanted sexual solicitation on the Internet, defined as unwanted requests to talk about sex, provide personal sexual information, and do something sexual, and Internet harassment, defined as rude or mean comments, or spreading of rumors.

RESULTS. Fifteen percent of all of the youth reported an unwanted sexual solicitation online in the last year; 4% reported an incident on a social networking site specifically. Thirty-three percent reported an online harassment in the last year; 9% reported an incident on a social networking site specifically. Among targeted youth, solicitations were more commonly reported via instant messaging (43%) and in chat rooms (32%), and harassment was more commonly reported in instant messaging (55%) than through social networking sites (27% and 28%, respectively).

CONCLUSIONS. Broad claims of victimization risk, at least defined as unwanted sexual solicitation or harassment, associated with social networking sites do not seem justified. Prevention efforts may have a greater impact if they focus on the psychosocial problems of youth instead of a specific Internet application, including funding for online youth outreach programs, school antibullying programs, and online mental health services.

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Key Words
Internet safety, harassment, solicitation, victimization, public policy

Abbreviation
IM—instant messaging

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EXPLOSIVE GROWTH OF Internet use among young people[1,2] has been mirrored by increasing awareness of its potential positive[3–5] and negative impacts[6–8] on the health and development of children and adolescents. Recently, public concern[9–11] has focused on accounts of youth being sexually solicited and harassed on social networking sites, such as MySpace and Facebook. Some politicians and lawmakers are advocating measures to restrict youth access to social networking sites as a means of preventing online sexual exploitation of youth Internet users.[12] Beyond anecdotal accounts, however, whether social networking sites truly increase the risk of sexual solicitation and other forms of online victimization, including harassment, has not been empirically examined. Without empirical support, it is possible that parents and health professionals working with youth will be misdirected and wrongly informed about truly effective Internet safety measures.

LEGISLATIVE ACTS TO CONTROL SOCIAL NETWORKING SITES

The issue of sexual predators online has received much attention on Capital Hill. In one summer month of 2006, 4 Congressional hearings were held on the subject, many resulting in calls for greater regulation and/or oversight of

social networking sites.[9] Congressman Michael Fitzpatrick (R-PA) introduced legislation that would require schools and libraries to restrict minors' access to social networking sites, broadly defined as sites that allow users to create profiles or Web pages about themselves.[10] Claiming that social networking sites were the "virtual hunting ground for predators" (as cited by ref 9), Congressman Fitzpatrick named his bill the Deleting Online Predators Act. It passed the House with a sweeping majority and was introduced into the Senate by Senator Ted Stevens (R-AK) as part of the Protecting Children in the 21st Century Act.[11] Discussions also have emerged from states attorneys general about the possibility of legal action against social networking sites to force them to introduce age verification technology[9] to prevent children under the age of 16 or 18 years from posting profiles. Although some Web sites currently have minimum age requirements (eg, MySpace restricts youth <14 years of age from having a profile), they are largely reliant on self-report. There are potential challenges to both of these legislative and litigious initiatives, and useful discussion of them can be found elsewhere.[9,13] Of greatest importance however, is whether social networking sites actually represent more of a risk to the safety of youth than other online venues so that restricting access to them might noticeably reduce the prevalence of Internet sexual solicitation and harassment among youth. In the absence of data, the rhetoric has the potential to redirect the attention of parents and health professionals from more risky online behaviors.

TECHNOLOGY

To understand the issues surrounding online sexual solicitation and harassment, one needs to have a general understanding of how people known and unknown to youth, including in some cases sex offenders, can use these online communication technologies to target youth.

A "chat room" is a place online where people gather to "chat." Most are open to anyone who wants to participate. Often the discussion is centered on specific subjects (eg, depression, relationships). Communication occurs in real time because messages are visible to the other parties as soon as the writer hits the "enter" key. Although chat is viewed by all of the participants in the room, chatters can pair off for private talk. Many sites allow users to post profiles with photographs and personal information, send photographs, and use Web cameras. Users create screen names, which can be a real name or a made-up name. Some chat rooms have rules and are monitored for compliance, but talk of sex in unmonitored teen chat rooms is common.[14] Youth can be targeted by unwanted sexual solicitation or harassment in chat rooms either publicly (ie, with all of the other participants in the room) or privately with someone inviting the youth to a private "room." Chat rooms seem to be losing popularity among teenagers since 2000; in 2005, 30% of youth between the ages of 10 and 17 reported having been to a chat room in the previous year.[7] As noted by Wolak et al, "many youth describe chat rooms as unpleasant places attracting unsavory people,"[7](p7) suggesting that youth who visit chat rooms may not be representative of the rest of youth.

"Instant messaging" (IM) is another real-time communication tool that allows 2 or more people who are using the same IM service to interact with each other in real time. Similar to chat rooms, to initiate a conversation, senders type messages that appear real time in windows on the computer screens of both senders and receivers. In contrast to chat rooms, which are open to anyone, IM messages are sent through screen names, so the sender must know the screen name of the recipient to send the message. Some IM services have a member directory, where users can create profiles that can include pictures and other information. These directories are searchable, and anyone with the same IM service can find a person's screen name and send them a message. Privacy settings can be set, however, to prevent messages from unknown people. Thus, one's privacy settings determine whether users can be contacted by strangers or only those who know them. Although more teenagers use e-mail, IMing is the Internet tool used most often to communicate with friends.[3] Indeed, an estimated 68% of youth between the ages of 10 and 17 years of age used IM at least once in 2005, as compared with 55% in 2000.[7]

"Blogs" are online journals. People use them as diaries or to comment on specific topics. Blogs can include detailed descriptions of personal experiences and feelings. Some include contact information and many allow for readers to post responses, thus allowing for contact from both known and unknown people. Sixteen percent of youth between the ages of 10 and 17 years of age reported using a blog or online journal in 2005.[7]

"Social networking sites" integrate all of the communication tools above. Users can create profiles that display personal information and upload pictures and video similar to a blog. Communication can occur in real time using chat or IM capabilities or can be posted for users to read at their leisure, similar to e-mail or message boards. Profiles can be set to a private setting, thereby limiting access by unknown people or requiring a reader to know the person's user name for them to send a message. Profiles also can be "public," thereby allowing anyone to send youth a message or view their profile. Public profiles also are searchable, which can allow anyone to identify people by searching on their name or other key words, such as town of residence. Some sites have user restrictions. For example, MySpace, the most popular social networking site, requires users to be at least 14 years of age, and profiles of youth under the age of 16 are automatically set to "private" so that they cannot be found with a general search. These communication tools are fast becoming a favorite among teenagers. A 2007 report by the Pew Internet and American Life Project[1] reveals that 55% of youth 12 to 17 years of age use social networking sites.

INTERNET VICTIMIZATION

Recent research has highlighted the adolescent health issues represented by unwanted sexual solicitation and Internet harassment.[6–8,15–17] Unwanted sexual solicitation

occurs when youth are asked to engage in sexual talk or sexual behavior or to provide personal sexual information when they do not want to. An example from the Youth Internet Safety Survey-2[7] is offered by a 15-year-old boy: "A girl in her teens asked me to get naked on 'cam' but I just ignored her." Internet harassment is defined by aggressive or embarrassing comments made to or posted about a youth online. As described by a 16-year-old girl: "Someone that I go to school with started spreading rumors about me by posting things in chat rooms and sending e-mails that were talking about me doing sexual things with all these different guys that were not true at all. I didn't even know the guys. [It happened] because at one point I got mad and we had a confrontation. [She] was doing these things to get back at me—for revenge." Both types of online interpersonal victimization online are associated with emotional distress and concurrent psychosocial problems, including depressive symptomatology and offline victimization (eg, physical assault by peers).[6–8,15–17] Certainly, the prevention of these types of experiences is of great importance. Whether recent suggestions to regulate or in other ways prevent youth from participating in social networking sites are an important step in doing so has yet to be examined empirically.

GAP IN THE LITERATURE

Recent findings suggest that interpersonal victimization online similar to offline victimization, occurs within a confluence of factors, including psychosocial problems, behavior problems online, and general Internet use characteristics. These findings also suggest that nuanced and complex analyses are appropriate when endeavoring to examine associated correlates. In this article, however, we take a very simple, direct approach to examine whether social networking sites are related to increased risk for Internet victimization. We do so because we believe that underlying all of the policy and judicial initiatives, as well as media images and Internet safety messages targeted at parents, is a central, unanswered question: are social networking sites unhealthy for youth, as defined by a place where Internet victimization is most likely to occur? If they are not, the current messaging has the potential to distract parents and professionals working with youth from monitoring other, more concerning online behaviors.

PARTICIPANTS AND METHODS

The Growing up With Media Survey is a national survey of 1588 youth ages 10 to 15 years conducted August to September 2006.[18] The survey protocol was reviewed and approved by the Centers for Disease Control and Prevention Institutional Review Board. The sample was obtained from the Harris Poll Online opt-in panel,[19] which is consistently comparable to data obtained from random telephone samples of the general populations when appropriate propensity and sample weights are applied.[20–23] Children were recruited through their parents who were members of the Harris Poll Online. Adults previously indicating having children in the household were randomly invited to participate, stratified by gender and age. Adults who responded to the invitation e-mail by clicking on a password-embedded link were taken to a Web site where eligibility was determined and informed consent obtained. Households were enrolled using a stratified random-sample design based on youth age and gender. After completing a brief survey, adults handed the survey to youth, who provided informed assent and completed their surveys. On average, adults took 5 minutes and youth took 21 minutes to complete their surveys. Youth received $15 gift certificates, and adults received $10 for participation.

Random-digit dialing response rates typically seem higher than online response rates, because it is impossible for online surveys to determine whether the e-mail has reached the intended recipient's inbox (as opposed to being filtered out by spam filters) and individuals who have not "picked up" their e-mail. The response rate for this online survey was calculated as the number of individuals who started the survey divided by the number of e-mail invitations sent, less any e-mail invitations that were returned as undeliverable. The survey response rate, 26%, is within the expected range of well-conducted online surveys.[24,25]

Compared with the general US population of adults with children between the ages of 10 and 15 years,[26] households in the current survey were slightly more likely to report a postgraduate college degree and less likely to report Hispanic ethnicity and an household income of $75 000 or more (Table 1).

Measures

Two types of online interpersonal victimization were queried: unwanted sexual solicitation and Internet harassment. Based on the Youth Internet Safety Surveys,[7,17] unwanted sexual solicitation was indicated if youth reported one of the following in the last year: (1) someone tried to get me to talk about sex online when I did not want to; (2) someone online asked me for sexual information about myself when I did not want to tell the person (eg, really personal questions, like what my body looks like or sexual things I have done); or (3) someone asked me to do something sexual when I was online that I did not want to do.

Internet harassment was indicated for youth who indicated in the last year that someone made a rude or mean comment to me online or someone spread rumors about me online, whether they were true or not. Youth also were asked whether anyone had made threatening or aggressive comments to them; although this item is typically included in our definition of harassment,[27,28] it is not here because the follow-up question about where online the incident occurs was not programmed into the surveys.

Youth reporting that any of these 5 online interpersonal victimization experiences had happened to them were asked in follow-up "what they were doing" when the solicitations or harassments occurred. They were instructed to mark all of the activities that applied, including IM, chat rooms, social networking sites, e-mail, and online games. Categories were not exclusive and

TABLE 1 **Sample Caregiver Demographic Characteristics Compared With National Population ($n = 1588$)**

Demographic Characteristic	CPS 2005, %	Unweighted GuwM Sample ($n = 1588$), %	Weighted GuwM Sample ($n = 1588$), %
Education			
High school graduate or less	45.6	23	44
Some college	17.7	32	18
Associates degree	10.1	12	11
College 4 y	18.0	17	18
Postgraduate	8.6	16	9
Decline to answer	NA	<1	<1
Age according to gender, y[a]			
Male 28–39	15.1	6	12
Male 40–49	23.4	16	20
Male 50–55	5.9	13	5
Female 28–39	24.9	26	27
Female 40–49	25.9	24	31
Female 50–55	4.8	15	6
Race/ethnicity			
Hispanic	18.2	12	18
Black (not Hispanic)	11.9	12	12
All other (not Hispanic)	69.9	74	69
Decline to answer	NA	1	1
Region			
East	21.2	25	20
South	31.6	29	32
Midwest	22.4	25	24
West	24.8	21	24
Household income			
$14 999 or less	6.5	4	5
$15 000 to $24 999	7.7	8	7
$25 000 to $34 999	9.0	13	10
$35 000 to $49 999	14.1	15	14
$50 000 to $74 999	22.6	23	20
$75 000 to $99 999	15.9	14	16
$100 000 or over	24.2	16	21
Decline to answer	NA	7	7
Child in household			
10- to 12-y-old male	23.8	25	24
10- to 12-y-old female	22.9	25	23
13- to 15-y-old male	28.3	25	28
13- to 15-y-old female	25.0	25	25

NA indicates not applicable; CPS, Current Population Survey; GuwM, Growing up With Media. Data are weighted to represent US adults ≥18 years of age with children between the ages of 10 and 15 years in the household according to the 2005 CPS.[26]

[a] Three percent of adult respondents were <28 years of age; 14% were over the age of 55 years.

reflected all of the different places where online youth were targeted in the previous year.

Statistical Methods

Data were weighted to reflect the population of adults with children ages 10 to 15 years old in the continental United States according to key demographic variables.[26] Then a propensity score weighting was applied. Propensity scores statistically adjust for respondents' propensity to be online by comparing data on lifestyle factors with data collected on the same items from samples of random-digit dial telephone surveys.[18,21,29,30] Potential differences in youth characteristics were tested for statistical significance using the Pearson χ^2 statistic corrected for the survey design with Rao's second-order correction converted into an F statistic.

RESULTS

All of the percentages reported in this section and displayed in Tables 1–4 are weighted as described above. Numbers are unweighted and reflect the actual number of youth respondents.[31]

As expected by survey design, half (48%) of the youth respondents were female (Table 2). Almost 1 (28%) in 3 youth were nonwhite. Seventeen percent of youth reported social networking sites as 1 of the 2 most

TABLE 2 **Internet Use and Victimization Characteristics ($n = 1588$)**

Personal Characteristic	% (*n*)
Demographic characteristics	
Age, y	
10–11	30.0 (522)
12–13	33.2 (505)
14–15	36.8 (561)
Female	47.8 (792)
Race	
White	71.7 (1171)
Black	12.6 (208)
Mixed race	8.8 (115)
All other	5.5 (69)
Asian	1.5 (25)
Hispanic ethnicity	18.2 (205)
Internet use	
Average frequency of use	
Every day/almost every day	48.5 (773)
A few times a week	36.5 (570)
Once a week	5.3 (96)
Once every couple of weeks	5.2 (84)
Less frequently	4.5 (65)
Average intensity of use	
<30 min	29.3 (446)
31 min to 1 h	27.7 (442)
>1 h	22.1 (374)
>2 h	21.0 (326)
Activities spent most time doing online[a]	
Playing games	47.0 (740)
IM	22.8 (370)
Social networking sites	16.7 (248)
E-mailing	14.2 (239)
Chat rooms	3.0 (43)
Blogging	1.2 (21)
Internet victimization	
Unwanted sexual solicitation	
Any type	14.7 (217)
Asked to do something sexual	11.4 (159)
Asked to engage in sexual talk	11.2 (160)
Asked to share personal sexual information	7.2 (107)
Internet harassment	
Any type	34.0 (503)
Rude or mean comments	31.0 (458)
Rumors spread online	13.1 (202)
Threatening or aggressive comments[b]	13.8 (191)

[a] Categories are not mutually exclusive; respondents were directed to pick 2; additional options not shown included doing school work (23%), listening to music (21%), surfing the web (20%), and buying things (6%).

[b] Data were not included in subsequent analyses because follow-up questions are not available.

TABLE 3 **Activities Youth Spend Most Time Doing When Online**

1 of 2 Activities Youth Spends Most Time Online Doing	Unwanted Sexual Solicitation (n = 1588)			Internet Harassment (n = 1588)		
	Not Solicited (85%), % (n)	Solicited (15%), % (n)	Statistical Comparison, P	Not Harassed (67%), % (n)	Harassed (33%), % (n)	Statistical Comparison, P
IM	20.3 (281)	37.4 (89)	<.001	14.6 (170)	39.9 (200)	<.001
Chat rooms	1.8 (23)	9.9 (20)	<.001	1.9 (15)	5.1 (28)	.01
Social networking site	14.2 (176)	31.1 (72)	<.001	9.8 (101)	30.9 (147)	<.001
E-mailing	13.8 (205)	16.7 (34)	.43	14.6 (175)	13.3 (64)	.65
Playing games	50.5 (684)	26.5 (56)	<.001	55.4 (578)	29.4 (142)	<.001
Blogging	0.9 (16)	3.0 (5)	.1	0.3 (6)	3.1 (15)	<.001

common activities that they engaged in when using the Internet.

Fifteen percent of all of the youth reported being the target of unwanted sexual solicitation in the previous year. Thirty-four percent reported any of the three types of harassment queried (Table 2). Thirty-two and a half percent reported being targeted by either rude or mean comments or rumors online in the previous year. Due to a programming error, "threatening or aggressive" comments are not included in subsequent analyses. In both cases, significantly more youth who reported that 1 of the 2 activities that they spent their most time online engaging in was IM, chat rooms, social networking sites, or playing games also reported online interpersonal victimization versus unaffected youth (Table 3). For example, compared with 31% of youth who reported an unwanted sexual solicitation, 14% of untargeted youth reported that social networking sites were 1 of their 2 most time-consuming activities online ($F(1, 1584) = 19.2$, $P < .001$).

An examination of locations online where youth reported online interpersonal victimization occurring (Table 4) suggested an incomplete overlap with online activities most commonly reported by youth. For example, chat rooms were one of the least frequently cited activities youth who were solicited and harassed reported engaging in frequently (Table 3) yet chat rooms were one of the most commonly cited places where interpersonal victimizations occurred (Table 4).

Four percent (n = 66) of all of the youth reported an unwanted sexual solicitation on a social networking site. Among those who were targeted, Table 4 shows where online incidents were most commonly reported.

Youth reporting unwanted solicitations in social networking sites were significantly more likely to be female (80%) than those solicited elsewhere (53%; $F(1, 1584) = 6.7$, $P = .01$). On the other hand, they were equally likely to report being targeted monthly or more often (29%) compared with youth solicited other places online (21%; $F(1, 584) = 0.7$, $P = .40$) and were of similar ages (solicited on social networking sites: 13.5 years; solicited elsewhere: 13.4 years; $F(1, 1584) = .04$, $P = .85$).

One (9% n = 130) in 10 youth reported being harassed on a social networking site. Table 4 shows where youth reported being harassed among those who were targeted. As with unwanted sexual solicitation, youth reporting harassment on social networking sites were significantly more likely to be female (66%) than those harassed elsewhere (48%; $F(1, 1584) = 5.8$, $P = .02$). They were equally likely to report being targeted monthly or more often (23%) than youth who were targeted elsewhere (23%; $F(1584) = .002$, $P = .97$). In contrast to solicitation, youth who were harassed in social networking sites were slightly but significantly older on average (13.8 years) than youth harassed other places online (13.1 years; $F(1, 1584) = 14.9$, $P < .001$).

DISCUSSION

Unwanted sexual solicitation and Internet harassment online seem to be having a negative impact on an important minority of youth,[6–8,15–17] and adolescent health

TABLE 4 **Location of Online Interpersonal Victimization**

Location Online	Unwanted Sexual Solicitation (n = 217)		Internet Harassment (n = 484)	
	Ever in the Last Year (n = 217), % (n)	Monthly or More Often (n = 42), % (n)	Ever in the Last Year (n = 484), % (n)	Monthly or More Often (n = 114), % (n)
IM	42.5 (99)	25.2 (14)*	54.8 (262)[a]	48.3 (61)
Chat rooms	31.7 (71)	28.4 (16)	19.2 (94)	27.5 (34)
Social networking site	27.1 (66)	33.6 (14)	27.5 (130)	27.3 (31)
E-mailing	21.6 (38)	49.6 (17)***	20.0 (98)	25.2 (29)
Playing games	17.9 (44)	10.0 (4)	24.4 (124)	34.4 (41)*
Blogging	5.5 (13)	14.1 (7)**	6.5 (40)	11.2 (15)

Locations/activities are not mutually exclusive. Youth were asked to report all of the places where the victimization occurred.
Data show the 2 most commonly reported locations online.
* p-value < .05; ** p-value < .01; *** p-value < .001; indicates statistically significant difference between youth reporting the victimization 'monthly or more often' versus 'less frequently.'

professionals play important roles in educating parents and the public on how to reduce the likelihood of these events. An important gap in this effort is an evaluation of victimization risk that social networking sites may pose to youth. With parents, politicians, law enforcement, and other professionals working with youth looking for answers, this study examines the relative report of online interpersonal victimization in social networking sites. Based on national data from 1588 youth between the ages of 10 and 15 years, our findings suggest that online interpersonal victimizations do not seem to occur to any greater degree and, in fact, seem to occur to a lesser degree in social networking sites than other places online where youth communicate with others. It should be noted that respondents in this survey are under the age of 16 years, exactly the group that is being focused on in legislative and litigious initiatives. Findings suggest that targeting social networking sites specifically may not be the best method of reducing the prevalence of online interpersonal victimization of children and younger adolescents.

How Often Does It Actually Happen in Social Networking Sites?

Our findings suggest that 15% of all youth report being targeted by unwanted sexual solicitation, 4% in a social networking site specifically. Similarly, 32.5% of youth report being harassed, either by threats or aggressive comments, or having rumors spread about them; 9% report being harassed while on a social networking site specifically. Youth are less likely to be targeted for unwanted sexual solicitation in social networking sites than they are through IM and in chat rooms, however, and are less likely to be a target of harassment on social networking sites than they are through IM.

The majority of IM sessions are opt-in conversations with people the youth know. Previous research suggests that many online interpersonal victimizations are perpetrated by peers,[7,17] which is perhaps why the most common place online where incidents occur is through IM. Given observations that talk of sex in unmonitored teen chat rooms is common,[14] it is unsurprising that sexual solicitations are commonly reported in chat rooms among targeted youth. Anyone can speak with anyone else who is in a public chat room. It is possible that these events occur between youth who are age-appropriately curious about sex[32,33] but lose control of the conversation. It is important to understand that the Internet, like any environment, is complex and is made up of many different contexts. Youth are more or less likely to be targeted by someone they know or for specific types of victimization based on the context, but also based on their behavior. Professionals working to reduce youth victimization online would likely have a bigger impact if they focused on youth behavior rather than regulating specific contexts.

Frequent incidents (ie, monthly or more often) of other unwanted sexual solicitation or harassment are equally likely to be reported on social networking sites as compared with all other places online. It is possible that the incidents are somehow different in nature, when a different measure is used (eg, likelihood of inducing distress). However, at least in terms of intensity, incidents on social networking sites seem similar to other places online and, therefore, may be equally as serious or benign as other places.

Girls are significantly more likely than boys to report unwanted sexual solicitation and harassment episodes on social networking sites than all other places online. Harassment is more frequently reported by older youth on social networking sites compared with all other places, although no age differences were noted for unwanted sexual solicitation. These noted differences are likely in part because older girls are more likely to have an online profile,[1] and they are more likely to be targeted for unwanted sexual solicitation generally.[8,16] Older youth are more likely to have online profiles[1] and to be engaged in Internet harassment generally.[6,15] From a prevention and intervention perspective, social networking sites seem to be effective places to reach older girls who may be demonstrating risky behaviors either in social networking sites as well as other places online.

Previous research suggests that youth who have ever used IM and chat rooms in the last year are significantly more likely to also report online interpersonal victimization,[6–7,15–17] and 1 recent national survey suggests that the general use of social networking sites is related to being harassed.[34] The current research supports these findings (Table 3) but also highlights the importance of identifying where exactly online the victimization occurred (Table 4).

Challenging Assumptions With Data

Over and over, our assumptions about online interpersonal victimization do not seem consistent with emerging data. We assumed that the majority of sex crimes that originated online were perpetrated by adults who were deceptive about their true identity, including their age and sexual intentions. This portrayal is not consistent with the data, however.[35] Research suggests that, in the majority of cases referred to law enforcement (95%), adult offenders are honest about being an adult, and in 79% of the cases, they are honest about their intentions to have sex with the youth.[36,37] Moreover, among youth who meet their offender offline, 3 (73%) in 4 do so more than once. These characteristics describe a crime different from that typically assumed to be the stereotypical sex crime and one that requires a different approach to prevention and intervention. Similarly, we assumed that the confluence of opportunities to share personal information, meet new people, and search for personal characteristics offered in social networking sites would create a particularly risky place for youth to be. The current findings suggest that this is not true and that prevention approaches might need to be repositioned. These data, along with other emerging research, highlight the importance of using data to inform prevention and safety measures.

Limitations

The current findings are the first to examine the comparative report of unwanted sexual solicitation and ha-

rassment occurring in social networking sites versus all of the other places youth visit online. However, findings should be examined within the confines of the limitations of the data. First, there are many underlying characteristics that would further illuminate frequencies of victimization reported here. For example, incidents that occur in environments where one's identity is more easily hidden may be of a different quality than that occurring in environments where the person is required to have the user's profile name to communicate with him or her. Furthermore, it is possible that the use of privacy controls in places where they can be enacted (eg, social networking sites) may discriminate between targeted and untargeted youth. On the other hand, those who "friend" everyone may be more likely targeted. Future research should examine whether there are youth characteristics (eg, emotional bond with caregiver or loneliness) that increase the likelihood of engaging in self-protective (eg, limiting profile to known friends only) or risk behaviors (eg, talking about sex to unknown individuals) online.

Our measure of unwanted sexual solicitation does not discriminate between those incidents that do and do not progress further into an offline sex crime. It is possible that frequency of location online where these incidents occur may be different for these more serious incidents.

Implications

Pediatricians and Other Health Providers

Current findings serve as a call to pediatricians to advocate for thoughtful and useful legislation that has the possibility of truly protecting the health and well being of youth. Social networking sites do not seem to increase one's likelihood of unwanted sexual solicitation or Internet harassment over and above other places online. Time and money spent on proposed legislation and legal action aimed at these sites may have a greater impact if they are focused on other areas of prevention, such as funding for online youth outreach programs, school antibullying programs, and online mental health services. Pediatricians also should educate parents and children about what does (and does not) increase the likelihood of online interpersonal victimization, including an admonition to parents to not just focus on their child's social networking site activity. They should help parents understand that it is less the technology and more a child's psychosocial profile and general online behavior (eg, harassing others, meeting people in multiple different ways online, and talking with people known only online about sex[35]) that is influential in explaining the likelihood of online interpersonal victimization.

Parents

Findings suggest that parents should not focus specifically on their children's use of social networking sites exclusive to other activities online. They should instead be aware of with whom, where, and about what topics their children are talking online. It is not the Internet or a specific place online, per se, but rather online behaviors and psychosocial problems that are most influential in explaining the likelihood of online interpersonal victimization.[38]

Internet Operators

One quarter of youth between the ages of 10 and 15 years reporting an unwanted sexual solicitation indicate that ≥1 incident occurred on a social networking site. This is a large enough percentage to suggest that Internet safety measures enacted on social networking sites could reduce the frequency of unwanted sexual solicitation online. An even larger impact might be realized through efforts aimed at improving Internet safety policies and youth behaviors on IM and in chat rooms as well; measures aimed at e-mail content and online gaming sites could also have an effect. All of the sites where people interact with each other online should allow users to control access to their personal information, as well as provide intuitive ways to stop and report any unwanted interaction quickly. For example, FaceBook and MySpace allow users to set their profile to "private" to limit access to their information, and data suggest that most youth are engaging in self-protective activities (an estimated 66% of youth with online profiles limit access to it).[1] There should be an easy tutorial to educate users who are not enacting self-protective measures on how to do so.

Going Beyond Sexual Predation

More than twice as many youth in the survey report being harassed (32.5%) versus being solicited (15%) both on the Internet as a whole, as well as in social networking sites specifically. Internet education messages should expand their focus to include harm reduction messages about Internet harassment.

CONCLUSIONS

The majority of youth who are online are not targeted for unwanted sexual solicitation or Internet harassment, and the majority of youth who are targeted do not report it occurring in a social networking site. Thoughtful approaches to prevention that focus on children's behaviors online (eg, harassing others) and their general psychosocial profile (eg, aggression problems or depressive symptomatology) instead of particular technologies (which will continue to evolve into new and more interactive applications) are needed. Policy proposals that aim to reduce the vulnerability of youth to sexual victimization online should focus not on restricting access to certain types of online communication tools but instead on mental health interventions for vulnerable youth and Internet safety education that apply to all types of online communications.

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REFERENCES

1. Lenhart A, Madden M. Social networking websites and teens: an overview. Available at: www.pewinternet.org/PPF/r/198/report_display.asp. Accessed November 16, 2007
2. University of Southern California Annenberg School. Surveying the digital future: a longitudinal international study of the individual and social effects of PC/Internet technology. Los Angeles, CA. Available at: www.digitalcenter.org/pages/site_content.asp?intGlobalId=22. Accessed May 5, 2007
3. Lenhart A, Madden M, Hitlin P. *Teens and Technology: Youth Are Leading the Transition to a Fully Wired and Mobile Nation*. Washington, DC: Pew Internet and American Life; 2005
4. Ybarra M, Suman M. Help seeking behavior and the Internet: a national survey. *Int J Med Inform.* 2005;75(1):29–41
5. Rideout V. Generation Rx.com: how young people use the internet for health information. Available at: www.kff.org/entmedia/20011211a-index.cfm. Accessed November 16, 2007
6. Ybarra M, Mitchell K, Wolak J, Finkelhor D. Examining characteristics and associated distress related to Internet harassment: findings from the Second Youth Internet Safety Survey. *Pediatrics.* 2006;118(4). Available at: www.pediatrics.org/cgi/content/full/118/4/e1169
7. Wolak J, Mitchell K, Finkelhor D. *Online Victimization of Youth: 5 Years Later*. National Center for Missing and Exploited Children Bulletin #07-06-025. Alexandria, VA: National Center for Missing and Exploited Children; 2006
8. Mitchell KJ, Finkelhor D, Wolak J. Online requests for sexual pictures from youth: risk factors and incident characteristics. *J Adolesc Health.* 2007;41(2):196–203
9. Thierer A. Social networking and age verification: many hard questions, no easy answers. Available at: www.pff.org/issues-pubs/pops/pop14.5ageverification.pdf. Accessed May 20, 2007
10. McCullagh D. Lawmakers take aim at social-networking sites. Available at: http://news.com/Congress+targets+social+network+sites/2100–1028_3–6071040.html. Accessed May 10, 2006
11. Stevens W. Protecting Children in the 21st Century Act, S. 49 (2007)
12. Consumer Advisory: AG Reilly Warns Parents About the Potential Dangers of Children Using Social Networking Sites Such as MySpace and Xanga. Available at: www.ci.amesbury.ma.us/home.nfs?a=amesbury&s=special&document=8781&group_id=47. Accessed August 29, 2006
13. Magid L. House misfires on internet safety. Available at: www.cbsnews.com/stories/2006/08/01/scitech/pcanswer/main1853357.shtml. Accessed August 1, 2006
14. Subrahmanyam K, Greenfield PM. Constructing sexuality and identity in an online teen chat room. *J Appl Dev Psychol.* 2004;25(6):651–666
15. Ybarra M, Mitchell K. Online aggressor/targets, aggressors, and targets: a comparison of associated youth characteristics. *J Child Psychol Psychiatry.* 2004;45(7):1308–1316
16. Mitchell K, Finkelhor D, Wolak J. Risk factors for and impact of online sexual solicitation of youth. *JAMA.* 2001;285(23):3011–3014
17. Finkelhor D, Mitchell K, Wolak J. *Online Victimization: A Report on the Nation's Young People*. Alexandria, VA: National Center for Missing and Exploited Children; 2000
18. Harris Interactive. Growing up With Media: methodology report. Available at: www.growingupwithmedia.com/pdf/GUWM_Methodology.pdf. Accessed May 17, 2007
19. Harris Interactive. Online methodology. Available at: www.harrisinteractive.com/partner/methodology.asp. Accessed July 5, 2006
20. Berrens RP, Bohara AK, Jenkins-Smith H, Silva C, Weimer DL. The advent of Internet surveys for political research: a comparison of telephone and Internet samples. *Pol Anal.* 2003;11(1):1–22
21. Schonau M, Zapert K, Simon LP, et al. A comparison between response rates from a propensity-weighted Web survey and an identical RDD survey. *Soc Sci Comput Rev.* 2004;22(1):128–138
22. Taylor H, Bremer J, Overmeyer C, Siegel JW, Terhanian G. The record of internet-based opinion polls in predicting the results of 72 races in the November 2000 US elections. *Int J Market Res.* 2001;43(2):2–8
23. Berrens RP, Bohara AK, Jenkins-Smith H, Silva C, Weimer DL. Information and effort in contingent valuation surveys: application to global climate change using national internet samples. *J Environ Econ Manage.* 2004;47:331–363
24. Cook C, Heath F, Thompson RL. A meta-analysis of response rates in Web- or Internet-based surveys. *Educat Psychol Measurement.* 2000;60(6):821–836
25. Kaplowitz MD, Hadlock TD, Levine R. A comparison of Web and mail survey response rates. *Public Opin Q.* 2004;68(1):94–101
26. Bureau of Labor Statistics, Bureau of the Census. Current population survey. 2005. Available at: www.bls.census.gov/cps/cpsmain.htm. Accessed July 5, 2006
27. Ybarra ML, Diener-West M, Leaf PJ. Examining the overlap in internet harassment and school bullying: implications for school intervention. *J Adolesc Health.* 2007;41(6 Suppl 1):S42–50
28. Ybarra ML, Espelage D, Mitchell KJ. The co-occurrence of Internet harassment and unwanted sexual solicitation victimization and perpetration: associations with psychosocial indicators. *J Adolescent Health.* 2007;41(6 Suppl 1):S31–41
29. Rosenbaum PR, Rubin DB. Reducing bias in observational studies using subclassification on the propensity score. *J Am Stat Assoc.* 1984;79(387):516–524
30. Terhanian G, Bremer J. Confronting the selection-bias and learning effects problems associated with Internet research. *Advertising Res Found J.* 2000;1–6
31. *Stata Statistical Software* [computer program]. Version 9.0. College Station, TX: Stata Corporation; 2006
32. Thornburgh D, Lin HS. *Youth, Pornography, and the Internet*. Washington, DC: National Academy Press; 2002
33. Martin CA, Kelly TH, Rayes MK, et al. Sensation seeking, puberty, and nicotine, alcohol, and marijuana use in adolescence. *J Am Acad Child Adolesc Psychiatry.* 2002;41(12):1495–1502
34. Lenhart A. *Cyberbullying and Online Teens*. Washington, DC: Pew Internet and American Life Project; 2007
35. Wolak J, Finkelhor D, Mitchell KJ, Ybarra ML. Online "Predators" and their Victims: Myths, Realities, and Implications for Prevention and Treatment. *American Psychologist.* In Press
36. Wolak J, Finkelhor D, Mitchell K. Internet-initiated sex crimes against minors: implications for prevention based on findings from a national study. *J Adolesc Health* 2004;35(5):424.e11–424.e20
37. Wolak J, Mitchell K, Finkelhor D. *Internet Sex Crimes Against Minors: The Response of Law Enforcement*. Alexandria, VA: National Center for Missing and Exploited Children; 2003
38. Ybarra M, Mitchell K, Finkelhor D, Wolak J. Internet prevention messages: targeting the right online behaviors. *Arch Pediatr Adolesc Med.* 2007;161(2):138–145

How Risky Are Social Networking Sites? A Comparison of Places Online Where Youth Sexual Solicitation and Harassment Occurs

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