



## Original article

# The Co-occurrence of Internet Harassment and Unwanted Sexual Solicitation Victimization and Perpetration: Associations with Psychosocial Indicators

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**Abstract**

**Purpose:** Previous research in offline environments suggests that there may be an overlap in bullying and sexual harassment perpetration and victimization; however to what extent this may be true for perpetration and victimization of Internet harassment and unwanted sexual solicitation is unknown.

**Methods:** The Growing Up with Media survey is a national cross-sectional online survey of 1,588 youth, 10–15 years old, who have used the Internet at least once in the last 6 months. Cluster analysis was conducted with four scales: Internet harassment perpetration, Internet harassment victimization, unwanted sexual solicitation perpetration, and unwanted sexual solicitation victimization.

**Results:** A four-cluster solution was identified: youth with little to no involvement ( $n = 1326$ ; 81.7%); perpetrator-victims of Internet harassment ( $n = 205$ ; 14.3%); victims of both Internet harassment and unwanted sexual solicitation ( $n = 45$ ; 3.1%); and perpetrator-victims of Internet harassment and unwanted sexual solicitation ( $n = 12$ ; .9%). Involvement in Internet harassment and unwanted sexual solicitation was associated with concurrent reports of psychosocial problems including substance use; involvement in offline victimization and perpetration of relational, physical, and sexual aggression; delinquent peers; a propensity to respond to stimuli with anger; poor emotional bond with caregivers; and poor caregiver monitoring as compared with youth with little to no involvement. This was especially true for perpetrator-victims of Internet harassment and unwanted sexual solicitation. Findings were replicated using a frequency-based definition of involvement, suggesting that cluster analysis is useful in identifying subgroups of youth and can be used to guide frequency-based definitions, which are easier to implement across study samples.

**Conclusions:** The majority of youth are not frequently involved in Internet harassment or unwanted sexual solicitation either as victims or as perpetrators. Among those who are, however, psychosocial problems are apparent. Perpetrator-victims of Internet harassment and unwanted sexual solicitation have emerged as a particularly important group for adolescent health professionals to be aware of, identify, and treat or refer into services immediately. © 2007 Society for Adolescent Medicine. All rights reserved.

**Keywords:**

Internet aggression; Internet sexual solicitation; Internet victimization; Internet perpetration; Cluster analysis

The Internet is increasingly an everyday fixture in the lives of young people and families [1,2]. It is a tool for

increased communication and social connectivity for young people [3]. On the other hand, the stripping away of many nonverbal cues, such as body language and voice fluctuations, makes interpretation of communications over the Internet sometimes challenging and can lead to aggressive or inappropriate exchanges [4]. Two emerging examples of

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this are Internet harassment and unwanted sexual solicitation. Harassment occurs when someone uses the Internet to express aggression towards another person. This can take the form of inflammatory e-mails or instant messages, or damaging pictures or text posted on a profile. Unwanted sexual solicitation is the act of encouraging someone to talk about sex, to do something sexual, or to share personal sexual information even when that person does not want to. Both types of communication have been linked to psychosocial challenges for youth targeted by them [5–12].

#### *Internet harassment and unwanted sexual solicitation*

Findings consistently report negative psychosocial characteristics for youth involved as victims of Internet harassment [5,6] and unwanted sexual solicitation [7,8], as well as perpetrators of harassment [9,10]. Little is yet known about perpetrators of unwanted sexual solicitation. Overlap involvement has been noted for victims and perpetrators of harassment [5,12], and victims of harassment and unwanted sexual solicitation [13]. There is some indication that psychosocial problems may be heightened for dually involved youth: harassment perpetrator-victims (akin to bully-victims) have the highest rate of psychosocial problems compared with all other youth, including problem/delinquent behavior, low school commitment, substance use, and poor parental monitoring [12]. The extent of co-occurrence of perpetration and victimization across both Internet harassment and unwanted sexual solicitation has not yet been examined, although these previous findings suggest that such an overlap exists, and that youth involved are likely facing multiple psychosocial challenges.

#### *Co-occurrence of verbal and sexual harassment*

Because research examining the co-occurrence of Internet harassment and unwanted sexual solicitation perpetration and victimization is in its infancy, it is useful to review the research on in-person bullying and sexual harassment. Estimates suggest that nearly 13% of students in the United States are bully perpetrators, 11% are victims of bullying, and 6% are both bullies and victims [14]. Involvement in sexual harassment appears to be higher, with an estimated 52–66% of students reporting perpetration and 79–83% reporting victimization by some form of sexual harassment [15]. The few studies that have examined potential overlaps between perpetration of bullying and sexual harassment suggest that students who are perpetrators of bullying are significantly more likely to also be perpetrators of sexual harassment [16,17]. Findings appear to be stable across countries, with similar findings noted among Brazilian [18] and Dutch [19] high school students. Less is known about the overlaps in bullying and sexual harassment victimization. Espelage and Holt [20] recently reported that students who are victims or bully-victims report the highest amount of peer sexual harassment compared with all other youth. Anxiety/depression levels are highest among these two

groups of youth, and this appears to be especially true for victims of bullying who concurrently report the highest levels of sexual harassment. Youth who are both victims of in-person bullying and sexual harassment therefore may be vulnerable to internalizing problems. Thus the literature of in-person experiences to date suggests that youth who are perpetrators of bullying are likely perpetrators of sexual harassment, and that the same is true for overlap between bullying and sexual harassment victimization.

#### *Complexities in data analysis*

Understanding the psychosocial correlates of Internet harassment and unwanted sexual solicitation requires a complex understanding of the youths' frequency of involvement [9,10] as well as potential overlaps in involvement as perpetrators and victims [5,12,13]. These complexities indicate that person-centered approaches, such as cluster analysis rather than variable-centered analysis, might be needed to examine the heterogeneity of these associations [21–23]. Cluster analysis uses patterns of behavior and experiences reported by youth to identify subtypes of experiences. It also has the ability to concurrently account for the frequency as well as different types of behavior and is therefore thought to provide a more sensitive measure of the way that people actually behave. Cluster analysis has the potential to illuminate overlaps in youth involvement in online harassment and unwanted sexual solicitation in a manner yet unexamined.

#### *Literature gaps*

Whether and how perpetration and victimization of Internet harassment and unwanted sexual solicitation overlap is unknown. Previous findings suggest, however, that illuminating these potential overlaps in involvement also may illuminate unique and important psychosocial problems that have implications for adolescent health and development. To help build our knowledge base of the potential overlap between sexual and verbal aggression experienced among youth, we will examine the co-occurrence of unwanted sexual solicitation and harassment online among youth between the ages of 10 and 15 years. Acknowledging the prolific literature documenting psychosocial problems for bully-victims both online [5,12] and offline [20,24,25], we will examine the co-occurrence of victims and aggressors of Internet harassment and unwanted sexual solicitation simultaneously. Cluster analysis will be used, which identifies subtypes of youth that have different patterns of behavior and experiences.

## **Methods**

### *Sample*

The Growing Up with Media survey is a longitudinal survey of 1588 youth aged 10–15 years. Baseline data were collected from August to September 2006 and are used for the current analyses. The survey protocol was reviewed and

approved by the Institutional Review Board of the Centers for Disease Control and Prevention.

Caregivers were randomly identified adult members of the Harris Poll Online (HPOL) opt-in panel, which includes more than 4 million members [26]. Adults were required to be English speaking and to be the most (or equally) knowledgeable about their youths' media consumption. Youth participants were required to be 10–15 years old, to read English, and to have used the Internet at least once in the last 6 months.

After eligibility was confirmed and consent obtained from the caregivers, they completed a 5-minute survey; they then handed off the survey to youth, who provided assent. Youth surveys took approximately 20 minutes to complete. The youth were encouraged to return to the survey later if they were not in a separate space where their responses could be kept private from others, including their caregivers.

The sample was balanced by design to have equal numbers of boys and girls as well as older (13–15 year old) and younger (10–12 year old) youth. Youth received a \$10 gift certificate and adults received \$5 cash for their participation.

The HPOL data are consistently comparable to data that have been obtained from random telephone samples of the general populations once propensity weighting and appropriate sample weights are applied [27–30]. Propensity weighting is a well-established statistical technique that, when applied to the data, minimizes the issue of nonrandomness and establishes equivalency for those who are in the sample versus those who are not in the sample due to self-selection bias [28,31,32].

Random digit dialing response rates typically appear 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 start the survey divided by the number of e-mail invitations sent minus any e-mail invitations that were returned as undeliverable. The survey response rate of 26% is within the expected range of well-conducted and methodologically sound online surveys [33,34].

### Measures

*Internet perpetration and victimization.* All six perpetration items (Internet harassment and sexual solicitation) started with the following stem: "In the last 12 months, how many times have you done the following when on the Internet?" The six victimization items started with the following stem, "In the last 12 months, how many times did the following happen to you when on the Internet?" Response options were coded as (1) never; (2) less than a few times per year; (3) a few times per year; (4) once or twice a month; (5) once or twice a week; and (6) everyday/almost everyday. Higher scores indicated more self-reported aggression and sexual solicitation perpetration or

victimization. The six perpetration questions were as follows: (1) made rude comments or mean comments to anyone online; (2) spread rumors about someone, whether they were true or not; (3) made aggressive or threatening comments to anyone online; (4) tried to get someone else to talk about sex online when they did not want to; (5) asked anyone online for sexual information about themselves when that person did not want to tell; and (6) asked anyone to do something sexual online when they did not want to. The six victimization questions were worded as follows: (1) someone made rude or mean comments to you; (2) someone spread rumors about you, whether they were true or not; (3) someone made a threatening or aggressive comment to you when they were online; (4) someone tried to get you to talk about sex online when you did not want to; (5) someone online asked you for sexual information when you did not want to tell; (6) someone asked you to do something sexual online that you did not want to do. Items querying unwanted sexual solicitation were from the Youth Internet Safety Surveys (YISS) [35,36]. One harassment item was from the YISS [35,36], another was adapted from an item referring to face-to-face bullying in the Youth Risk Behavior Surveillance survey [37], and the third was created for this survey.

Exploratory factor analyses were conducted to identify latent variables within the 12 items, and then factors were confirmed with confirmatory factor analysis (CFA) using robust maximum likelihood estimation. The four-factor solution yielded a .03 RMSEA [25], a goodness-of-fit index of .98, and an adjusted goodness-of-fit index of .96. Based on the confirmatory factor analysis results, four measures were created: Internet harassment perpetration (range, 1–6; Cronbach  $\alpha = .82$ ); Internet harassment victimization (range, 1–6; Cronbach  $\alpha = .79$ ); Internet sexual solicitation perpetration (range, 1–6; Cronbach  $\alpha = .93$ ); and Internet sexual solicitation victimization (range, 1–6; Cronbach  $\alpha = .93$ ).

*Expression of anger.* One's propensity to respond to stimuli with anger was measured using the State-Trait Anxiety Index (STAXI)—Anger scale (Cronbach's  $\alpha = .81$ ) [38,39]. Participants were asked to indicate how true each of the 10 items were for them, focusing on how they usually felt. Examples included the following: (1) I feel mad, and (2) I get angry. Response options were (1) hardly ever true, (2) sometimes true, and (3) often true.

*Offline victimization.* Offline relational victimization was indicated if youth had experienced the either of the following: "Another person your age did not let you be in their group anymore because he/she was mad at you" or "Another person spread a rumor about you, whether it was true or not," a few times per year or more frequently.

Offline physical victimization was indicated if any of these items from the Juvenile Victimization Questionnaire occurred a few times per year or more often [40]: (1) "Someone stole something from me—for example, a backpack, wallet, lunch money, book, clothing, running shoes,

bike, or anything else”; (2) “Another person or group attacked me—for example, an attack at home, at someone else’s home, at school, at a store, in a car, on the street, at the movies, at a park, or anywhere else”; and (3) “Someone pulled a knife or gun on me.”

*Offline aggression.* Offline relational aggression was indicated if youth did not let another person their age into their group because the youth was mad at them, or if they spread a rumor about someone else, whether or not it was true, a few times per year or more frequently. Offline physical aggression was measured by one item: youth who had shoved, pushed, hit, or slapped another person their age a few times per year or more often. Offline sexual violence was assessed by asking, “How many times have you kissed, touched, or done anything sexual with another person when that person did not want you to?”

#### Data analysis

Data were weighted statistically to reflect the population of adults with children ages 10–15 years old in the U.S. according to adult age, gender, race/ethnicity, region, education, household income, and child age and gender [41]. Next propensity score weighting was applied to adjust for adult respondents’ propensity to be online [27–30]. Missing data were conservatively coded as symptom absent.

The first step of the cluster analysis was to run a *k*-means cluster analysis using SPSS (SPSS Inc., Chicago, IL) and SYSTAT (SyStat Software, San Jose, CA) to investigate Internet aggression perpetration/victimization subtypes using the four Internet victimization/perpetration subscales described above. Ward’s algorithm [21] was used to derive cluster solutions, followed by the complete linkage method [22,23]. We then re-analyzed the data using a nonhierarchical clustering method, *k*-means iterative partitioning.

The difference in distribution of characteristics across the identified subtypes of youth were tested for statistical significance using the Pearson  $\chi^2$  statistic corrected for the survey design using Rao’s second-order correction [42], which was then converted into an *F* statistic (Stata Corp, 2006) [43]. These *F*-statistics provide a test of independence that accounts for the survey design [43]. All comparative analyses were conducted using the Stata 9 statistical analysis package [43], and all incorporated survey sampling weights and accounted for a stratified sampling design. Percentages reported here and in the tables are weighted as described above; numbers reported in the tables are not weighted and are reflective of the actual sample [43].

## Results

### Demographic characteristics

As expected by survey design, 48% of youth participants were female and 52% male, with an average age of 12.6 years (SE = .05).

In all, 18% of the youth self-reported as being of Hispanic ethnicity and 28% a minority race (13% black, 9% mixed, and 7% all other races). Of the caregivers, 64% were female and 74% were married; 22% reported an annual income of less than \$35,000 and 28% reported an annual income of \$100,000 or more.

### Involvement in Internet harassment and unwanted sexual solicitation

Among all youth, 62% of youth reported no involvement in either Internet harassment or unwanted sexual solicitation. Thirty-five percent reported being the victim of either Internet harassment or unwanted sexual solicitation. Twenty-one percent reported perpetrating either Internet harassment or unwanted sexual solicitation.

Thirty-four percent of all youth reported being the victim of Internet harassment at least once in the previous year, 8% reported being targeted monthly or more often specifically. Twenty-one percent reported perpetrating Internet harassment of others at least once in the last year, 4% reported doing so monthly or more often. Involvement in unwanted sexual solicitation was reported less frequently. Fifteen percent of all youth reported being victims at least once in the previous year, 3% reported unwanted solicitations monthly or more often. Three percent reported perpetration of unwanted sexual solicitation of others in the last year, 1% reported doing so monthly or more often.

### Overlap between Internet harassment and unwanted sexual solicitation

When reports of victimization were examined, 1% of youth reported being only victims of unwanted sexual solicitation, 21% of youth reported being only victims of Internet harassment, and 13% of all youth reported being victims of both Internet harassment and unwanted sexual solicitation. Examination of perpetration behavior revealed that 3% of all youth surveyed reported being perpetrators of both Internet harassment and sexual solicitation. Less than 1% (.4%) reported being only perpetrators of unwanted sexual solicitation, and 18% reported being only perpetrators of Internet harassment. When looking at both victimization and perpetration behaviors together, all youth who reported being perpetrators of unwanted sexual solicitation reported being involved in other forms of online victimization and perpetration as well.

### Cluster descriptions

A four-cluster solution was identified. Cluster 1, labeled the “Little or no experience” subtype, defined the majority of youth ( $n = 1326$ , 81.7%; Table 1). These youth had the lowest scores across all scales, indicating very limited or no experience with perpetration or victimization of Internet harassment or unwanted sexual solicitation. Cluster 2 ( $n = 205$ , 14.3%), “Perpetrator-victims of Internet ha-

Table 1  
Internet harassment and sexual solicitation perpetration and victimization by cluster membership ( $N = 1588$ )

	Little or no experience (81.7%, $n = 1326$ )		Perpetrator-victims of Internet harassment (14.3%, $n = 205$ )		Victims of Internet harassment + unwanted sexual solicitation (3.1%, $n = 45$ )		Perpetrator-victims of Internet harassment + unwanted sexual solicitation (0.9%, $n = 12$ )	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Internet harassment perpetration	1.05	.16	1.70	.76	1.73	.83	4.44	.81
Internet harassment victimization	1.08	.18	2.29	.63	3.08	.99	4.86	.86
Sexual solicitation perpetration	1.00	.03	1.08	.44	1.19	.44	3.78	1.42
Sexual solicitation victimization	1.03	.15	1.31	.15	3.56	.82	4.00	1.64

harassment,” was characterized by youth who scored nearly 1 SD above the scale mean for Internet harassment victimization (mean = 2.29, SD = .63) and 1 SD above the mean on the Internet harassment perpetration scale (mean = 1.70, SD = .76), but low on the unwanted sexual solicitation (mean = 1.08, SD = .44) victimization and perpetration scales (mean = 1.31, SD = .15). Data indicate that, on average, these youth were targeted by Internet harassment, and perpetrated Internet harassment less than a few times per year. Cluster 3 ( $n = 45$ ; 3.1%), “Victims of Internet harassment + unwanted sexual solicitation,” had Internet harassment and unwanted sexual solicitation victimization scale scores that were 3 SDs about the sample mean (mean = 3.08, SD = .99, and mean 3.56 = SD = .82, respectively), and Internet harassment perpetration scale scores 1 SD above the mean (mean = 1.73, SD = .83). On average, these youth were victims of Internet harassment a few times a year and unwanted sexual solicitation once or

twice per month and perpetrators of Internet harassment less than a few times per year. Finally Cluster 4 was designated the “Perpetrator-Victims of Internet harassment + unwanted sexual solicitation” group ( $n = 12$ ; .9%). On average, members of this group had scores several SDs above the mean on all four subscales, suggesting that they were involved in Internet harassment and unwanted sexual solicitation, as perpetrators and victims of unwanted sexual solicitation, once or twice per month, and victims of Internet harassment once or twice a week.

As shown in Table 2, youth in the “Little or no experience” category tended to be younger and to have caregivers who were married compared with all other youth.

#### Psychosocial characteristics

As shown in Table 3, involvement in Internet harassment and unwanted sexual solicitation was associated

Table 2  
Demographic characteristics based on subtypes of Internet harassment and sexual solicitation perpetration and victimization ( $N = 1588$ )

Characteristic	Little or no experience (81.7%, $n = 1,326$ )	Perpetrator-victims of Internet harassment (14.3%, $n = 205$ )	Victims of Internet harassment + unwanted sexual solicitation (3.1%, $n = 45$ )	Perpetrator-victims of Internet harassment + unwanted sexual solicitation (.9%, $n = 12$ )	$p$
	% ( $n$ )	% ( $n$ )	% ( $n$ )	% ( $n$ )	
Age, years, mean (SE)	12.4 (.06)	13.4 (.1)	13.5 (.3)	13.5 (.4)	<.001
Female	46.6% (645)	52.3% (109)	62.3% (34)	35.9% (4)	.32
Race					.05
White	70.0% (962)	81.8% (169)	66.4% (30)	82.1% (10)	
Black/African-American	13.2% (184)	6.7% (14)	26.3% (9)	8.9% (1)	
Mixed race	9.5% (99)	6.5% (13)	2.3% (3)	.0% (0)	
All other	7.3% (81)	5.0% (9)	4.9% (3)	9.1% (1)	
Hispanic ethnicity	19.7% (177)	12.3% (20)	11.0% (8)	.0% (0)	.08
Caregiver					
Female	65.8% (892)	54.6% (116)	54.9% (28)	26.2% (4)	.02
Married	77.6% (975)	59.0% (135)	62.1% (26)	54.3% (7)	<.001
Household income					.94
<\$35,000	22.4% (328)	20.2% (51)	30.2% (13)	19.5% (2)	
\$35,000–99,999	50.1% (688)	49.1% (104)	46.5% (24)	45.9% (6)	
\$100,000+	27.5% (310)	30.7% (50)	23.3% (8)	34.6% (4)	

Table 3  
Comparison of psychosocial characteristics based upon Internet harassment and sexual solicitation perpetration and victimization subtype ( $N = 1588$ )

Psychosocial characteristics	Little or no experience (81.7%, $n = 1,326$ )	Perpetrator-victims of Internet harassment (14.3%, $n = 205$ )	Victims of Internet harassment + unwanted sexual solicitation (3.1%, $n = 45$ )	Perpetrator-victims of Internet harassment + unwanted sexual solicitation (.9%, $n = 12$ )	$p$
	% ( $n$ )	% ( $n$ )	% ( $n$ )	% ( $n$ )	
<b>Substance use</b>					
<b>Alcohol</b>					
Never	93.0% (1231)	66.3% (142)	53.3% (26)	49.6% (7)	<.001
In the last year	3.9% (56)	14.1% (30)	16.4% (7)	19.5% (2)	
In the last 30 days	2.9% (34)	12.6% (21)	24.7% (10)	1.3% (1)	
At least five drinks in one sitting in last 30 days	.2% (5)	7.0% (12)	5.6% (2)	29.6% (2)	
<b>Marijuana</b>					
Never	97.2% (1288)	85.5% (184)	84.8% (40)	52.5% (8)	<.001
Less than once per month	2.3% (31)	10.6% (16)	7.3% (3)	.0% (0)	
At least once per month	.5% (7)	3.9% (5)	7.9% (2)	47.5% (4)	
<b>Inhalants (ever)</b>					
Inhalants (ever)	1.0% (17)	4.3% (5)	1.9% (1)	75.0% (6)	<.001
<b>Other drugs (ever)</b>					
Other drugs (ever)	.7% (12)	1.6% (2)	.0% (0)	49.1% (4)	<.001
<b>Offline victimization</b>					
Relational	29.5% (399)	68.6% (140)	72.7% (33)	97.4% (11)	<.001
Physical	8.8% (110)	23.8% (58)	50.9% (21)	76.5% (9)	<.001
<b>Offline perpetration of aggression</b>					
Relational	10.1% (129)	31.0% (68)	46.9% (18)	100.0% (12)	<.001
Physical	10.4% (134)	30.4% (55)	16.8% (11)	100.0% (12)	<.001
Sexual	.8% (13)	4.7% (9)	11.9% (7)	75.2% (8)	<.001
<b>Delinquent peers, mean (SE)</b>					
Delinquent peers, mean (SE)	.3 (.0)	.9 (.2)	1.3 (.4)	3.0 (.7)	<.001
<b>Propensity to respond to stimuli with anger, mean (SE)*</b>					
Propensity to respond to stimuli with anger, mean (SE)*	14.2 (.1)	16.3 (.4)	15.4 (.8)	17.2 (1.3)	<.001
<b>Caregiver child relationship*</b>					
Emotional bond, mean (SE)	5.3 (.1)	6.2 (.2)	5.4 (.4)	8.2 (.5)	<.001
Monitoring, mean (SE)	2.8 (.1)	3.3 (.1)	3.3 (.3)	5.6 (.7)	<.001
Coercive discipline, mean (SE)	2.6 (.03)	2.8 (.1)	2.9 (.2)	2.8 (.3)	.29

\* A higher score reflects a worse rating.

with higher frequency of reported concurrent psychosocial characteristics compared with uninvolved youth, and this was especially true for youth categorized as “Perpetrator-Victims of Internet harassment + unwanted sexual solicitation.” For example, 75.0% of those in the “Perpetrator-Victims of Internet harassment + unwanted sexual solicitation” category reported inhalant use in the last year, compared with 4.3% of those in the “Perpetrator-victims of Internet harassment,” 1.9% of “Victims of Internet harassment + unwanted sexual solicitation,” and 1.0% of “Little/no experience” categories ( $p < .001$ ). In addition, indications of perpetration and victimization of aggression in-person were noted for youth involved in Internet harassment and unwanted sexual solicitation. Indeed 100% of those in the “Perpetrator-Victims of Internet harassment + unwanted sexual solicitation” category reported offline relational and physical aggression, and 75.2% reported sexual aggression in the past year. The presence in one’s life of delinquent peers, the propensity to respond to stimuli with anger, and troubled relationships with one’s caregiver also were elevated for youth involved in Internet harassment and unwanted sex-

ual solicitation, and were most notably so for “Perpetrator-Victims of Internet harassment + unwanted sexual solicitation.”

#### Comparison of methodological approaches

Frequency-based definitions of behaviors are frequently used in epidemiological research and allow common definitions across analyses. They assume, however, that the correct classifications are known. To compare the estimates yielded by a frequency-based definition of Internet harassment and unwanted sexual solicitation perpetration and victimization with the four-cluster solution, youth were coded into one of four categories based on the groups identified in the cluster analysis: (1) those with very limited or no experience with perpetration or victimization of Internet harassment or unwanted sexual solicitation (83.7%,  $n = 1344$ ); (2) those who were targeted by Internet harassment and who perpetrated Internet harassment less than a few times per year or more often (14.4%,  $n = 219$ ); (3) those who were victims of both Internet harassment a few times a year and un-

Table 4  
Comparison of class membership of cluster analysis versus frequency coding ( $N = 1588$ )

Frequency coding		Cluster analysis				Total
		Little or no experience	Perpetrator-victims of Internet harassment	Victims of Internet harassment + unwanted sexual solicitation	Perpetrator-victims of Internet harassment + unwanted sexual solicitation	
Little or no experience	n	6	0	0	0	6
	% row	100	0	0	0	100
	% column	56.2	0	0	0	0.5
Perpetrator-victims of Internet harassment	n	2	14	3	0	19
	% row	18.6	70.6	10.8	0	100
	% column	31.2	33.1	1.1	0	1.5
Victims of Internet harassment + unwanted sexual solicitation	n	4	13	133	69	219
	% row	0.8	5.0	63.7	30.5	100
	% column	12.6	23.2	63.8	5.4	14.4
Perpetrator-victims of Internet harassment + unwanted sexual solicitation	n	0	18	69	1257	1344
	% row	0	1.6	6.0	92.4	100
	% column	0	43.8	35.1	94.6	83.7
Total	n	12	45	205	1326	1588
	% row	0.9	3.1	14.3	81.7	100
	% column	100	100	100	100	100

wanted sexual solicitation once or twice per month or more often and who were perpetrators of Internet harassment less than a few times per year or more often (1.5%,  $n = 19$ ); and (4) those involved in both Internet harassment and unwanted sexual solicitation perpetrators, victims of unwanted sexual solicitation once or twice per month or more often, and victims of Internet harassment once or twice per week (.5%,  $n = 6$ ).

The frequency-based definition classified 89% of youth in the same category of Internet harassment and unwanted sexual solicitation involvement as did the cluster analysis definition. Categorizations based on frequency coding versus the cluster analysis are shown in Table 4. Associations with psychosocial characteristics also were very similar to the cluster analysis definition, as shown in Table 5.

## Discussion

The vast majority (82–84%) of children and adolescents between the ages of 10 and 15 years report little (i.e., less than monthly) or no experience with any of the Internet harassment or unwanted sexual solicitation behaviors queried. Nonetheless, as predicted by previous research [13,16–20], overlap in involvement with Internet harassment and unwanted sexual solicitation is noted: 2–3% of youth report behaviors consistent with involvement as victims of both Internet harassment and unwanted sexual solicitation, and about 1% report behaviors consistent with both perpetration and victimization of both Internet harassment and unwanted sexual solicitation. This small group of youth report particularly concerning levels of psychosocial problems, and should be a priority of professionals working with children and adolescents.

## Concurrent psychosocial correlates

The psychosocial picture of youth involved in Internet harassment and unwanted sexual solicitation is concerning, and this is especially true for youth who are perpetrator-victims of Internet harassment + unwanted sexual solicitation (Table 3). Indeed, of the 12 youth in this group, 29.6% have had five or more drinks in the past 30 days; 47.5% report monthly marijuana use; 75.0% report using inhalants; and 49.1% report use of other, “harder” drugs. They have, on average, three close friends who have either been involved with the law or done something that would place them at risk for police contact. Their emotional relationship with their primary caregiver is poor, the caregiver monitoring is suboptimal, and their propensity to respond to stimuli with anger is high. In short these youth are facing a multitude of personal challenges that negatively impact healthy youth development. These results suggest that adolescent health professionals should be especially aware of, and should ask about involvement in, aggressive behaviors that youth may be involved in online both as perpetrators and as victims. If an estimated four of 500 youth (i.e., .9%) fall into this category, it is not unreasonable to expect that professionals working with youth in multiple capacities have the potential to come into contact with these youth.

Youth who are involved as victims of Internet harassment + unwanted sexual solicitation or perpetrator-victims of Internet harassment also report psychosocial problems at elevated levels compared with those reported by youth with little/no experience. Problems include alcohol use and marijuana use, and inhalant use specifically for perpetrator-victims of Internet harassment. They have, on average, one close friend who is engaged in delinquent behavior. Thus although the rates of psychosocial problems are not as high

**Table 5**  
Comparison of psychosocial characteristics based upon Internet harassment and sexual solicitation perpetration and victimization using frequency analysis approach ( $N = 1588$ )

Psychosocial characteristics	Little or no experience 83.7% (1344)	Perpetrator-victims of Internet harassment 14.4% (219)	Victims of Internet harassment + unwanted sexual solicitation 1.5% (19)	Perpetrator-victims of Internet harassment + unwanted sexual solicitation 0.5% (6)	<i>p</i>
	% (n)	% (n)	% (n)	% (n)	
<b>Substance use</b>					
<b>Alcohol</b>					
Never	91.9% (1237)	69.6% (157)	23.4% (8)	68.1% (4)	<0.001
In the last year	4.3% (62)	12.8% (28)	22.3% (4)	15.8% (1)	
In the last 30 days	3.5% (36)	11.2% (26)	30.0% (4)	0.0% (0)	
5+ drinks in 1 sitting in last 30 days	0.3% (9)	6.4% (8)	24.3% (3)	16.1% (1)	
<b>Marijuana</b>					
Never	96.2% (1301)	89.9% (200)	73.2% (16)	52.0% (3)	<0.001
Less than once a month	3.3% (36)	5.7% (13)	3.4% (1)	0.0% (0)	
At least monthly	0.5% (7)	4.5% (6)	23.4% (2)	48.0% (3)	
<b>Inhalants (ever)</b>					
Other drugs (ever)	0.9% (17)	5.2% (6)	18.6% (2)	77.9% (4)	<0.001
	0.7% (13)	1.2% (1)	18.6% (2)	31.9% (2)	<0.001
<b>Offline victimization</b>					
Relational	32.3% (437)	57.7% (125)	83.6% (15)	100.0% (6)	<0.001
Physical	10.8% (138)	17.7% (46)	63.5% (9)	70.1% (5)	<0.001
<b>Offline perpetration of aggression</b>					
Relational	11.6% (144)	27.0% (66)	63.7% (11)	100.0% (6)	<0.001
Physical	11.3% (145)	25.3% (54)	43.2% (7)	100.0% (6)	<0.001
Sexual	0.8% (12)	5.1% (14)	39.8% (6)	70.1% (5)	<0.001
Delinquent peers (M:SE)	1.1 (0.2)	2.6 (0.5)	3.2 (1.1)	3.2 (1.1)	<0.001
Propensity to respond to stimuli with anger (M:SE)*	16.4 (0.4)	16.9 (0.9)	15.8 (1.8)	15.8 (1.8)	<0.001
<b>Caregiver child relationship*</b>					
Emotional bond (M:SE)	5.3 (0.1)	6.1 (0.2)	7.0 (0.3)	8.2 (0.8)	<0.001
Monitoring (M:SE)	2.8 (0.1)	3.2 (0.1)	4.3 (0.4)	5.7 (1.2)	<0.001
Coercive discipline (M:SE)	2.6 (0.0)	2.8 (0.1)	2.9 (0.1)	2.5 (0.6)	0.03

\* A higher score reflects a worse rating.

as those of perpetrator-victims of Internet harassment + unwanted sexual solicitation, their problems are still at concerning levels, and appear to be diffuse and to range across several domains.

#### *Overlap between online and offline behaviors*

The overlap between online and offline aggression perpetration and victimization is striking. Depending on the category, 68.6–97.4% of victims of Internet harassment online are victims of relational harassment offline (Table 3). Offline physical victimization is reported by 23.8–76.5% of these youth also, depending on their involvement category. Offline perpetration is similarly elevated, with an especially concerning 100% of Internet harassment and sexual solicitation perpetrator-victims reporting relational as well as physical aggression and 75.2% reporting sexual aggression. In comparison, 10% of youth with little to no involvement report relational or physical aggression, and .8% report sexual aggression. Clearly these data suggest that youth who are involved in harassment and sexual solicitation online are

involved in aggressive behaviors offline, both as perpetrator and as victims, in very concerning ways.

#### *Comparison of methodological approaches*

Not everyone has access to a statistician with the skills to conduct cluster analysis. As such we wanted to examine the potential differences and similarities in findings using a cluster analysis–defined behavior group versus a frequency-defined behavior group. The subgroups identified in the cluster analysis were used as a guide in creating the frequency-defined behavior groups by translating the mean scores into frequency requirements. For example perpetrator-victims of Internet harassment had a mean score of 2.3 on victimization of Internet harassment in the cluster analysis. This is roughly equivalent to victimization less than a few times per year. When the frequency-defined behavior groups were created, the perpetrator-victims of Internet harassment were required to have reported victimization of Internet harassment at least a few times per year or more often.



The frequency-defined categories resulted in similar prevalence rates of intense involvement in Internet harassment and unwanted sexual solicitation (Table 5) compared with the cluster analysis definition (Table 3). Eighty-nine percent of youth are given the same classification of involvement using either method of definition. Furthermore the associations between involvement in Internet harassment and unwanted sexual solicitation, and psychosocial characteristics are similar for both methods of classifying the data. This suggests that cluster analysis is indeed a useful tool in identifying subtypes of behavior that can be used to guide frequency-based definitions, which are easier to replicate across studies. This is important, as often we assume that we know the correct patterns of behavior and force youth into predetermined categories that may not always be reflective of the true manner in which youth behave. Once the subgroups have been identified, either methodology can justifiably be used in subsequent analyses.

#### *Nuances in Internet harassment involvement and unwanted sexual solicitation*

Several interesting nuances in the observed overlap between perpetration and victimization, and between Internet harassment and unwanted sexual solicitation, have emerged. Dual involvement in harassment and sexual solicitation is especially notable for youth reporting unwanted sexual solicitation. In all, 38% of the youth report some form of Internet victimization, and 35% report Internet harassment victimization. In addition 21% of youth report some form of perpetration of Internet victimization; almost all of these youth report perpetration of Internet harassment. Thus, for both victimization and perpetration, almost all youth who are involved in unwanted sexual solicitation also are involved in Internet harassment. It may be that intervention efforts should be focused especially on unwanted sexual solicitation, as this appears to be a behavior that the majority of dually involved youth are engaging in.

Overall victimization is reported more commonly than perpetration of Internet harassment and unwanted sexual solicitation among youth in this survey. Nonetheless the cluster analysis suggests that even among youth reporting victimization, perpetration behaviors are still noted, yet they are at frequency levels of less than a few times per year. It might be fruitful in future studies to understand when the perpetration occurs in relation to the victimization. The perpetration reported by these victims might be in reaction to the victimization experience, or it might contribute to the continuance of the victimization.

#### *Challenging common wisdom*

The common definition of bullying indicates that the behavior must be frequent and must continue over time [44], even though studies suggest that most bullying behavior occurs infrequently rather than frequently [45,46]. The current cluster

analysis indicates that infrequent involvement in Internet harassment and unwanted sexual solicitation is influential in the identification of subgroups of youth. Indeed youth identified as perpetrator-victims of Internet harassment are targeted by Internet harassment and perpetrate Internet harassment less than a few times per year on average. Victims of Internet harassment + unwanted sexual solicitation are, on average, victims of Internet harassment a few times a year and unwanted sexual solicitation once or twice per month and perpetrators of Internet harassment less than a few times per year. This suggests that the common definition of bullying may be too restrictive and does not reflect the way most youth are involved in bullying and sexual harassment. It should be noted that, consistent with previous findings [10,45,47], as the frequency of involvement in Internet harassment and unwanted sexual solicitation increases, the prevalence of psychosocial problems also increases. Thus frequency of involvement should be a marker for particular concern, even though it is less clear that it should be a requirement for the definition of “bullying.”

#### *Study limitations*

Our findings should be interpreted within the limitations of the study. The data are cross-sectional and thus cannot determine temporality. It is equally possible that youth who were physically victimized offline perpetrated Internet harassment online afterward or beforehand. Second, because the Growing Up with Media survey was not designed specifically to measure offline bullying perpetration and victimization, the measures are somewhat crude. It should also be noted that our findings involve youth who are “frequently” involved—youth who report being victims or perpetrators infrequently are coded into the “little or no involvement” group. Thus our prevalence rates may appear lower than those cited in other studies. It is important to interpret findings across studies by noting potential differences in definition, including frequency of report.

#### *Study implications*

It is not surprising that youth who are acting out online and offline in multiple different ways are at the greatest risk for also reporting concurrent psychosocial challenges—particularly substance use. Yet the identification of this group in our sample provides further evidence for the need for intervention and prevention programs designed to identify these youth and refer them to proper clinical care early. Moreover frequent perpetration of either Internet harassment or unwanted sexual solicitation appears to be an important marker for troubled youth, as both behaviors appear to cluster together. If youth are engaging in one type of perpetration, it is highly likely they are engaging in the other type as well. These youth are not just perpetrators, however, but are also frequent victims of both Internet harassment and unwanted sexual solicitation. Given our findings that these youth ap-

pear to be especially troubled in other areas of their lives, identification and immediate intervention is important.

It is important to consider future research questions: What types of experiences do these students have at school related to aggression and sexual harassment? Do youth who report experiencing sexual solicitation as victims or perpetrators online have prior experiences such as childhood sexual abuse or emotional neglect? How do these subtypes vary over time, and what predicts changes in subtypes?

## Conclusions

The majority of youth who use the Internet are not frequently involved in Internet harassment or sexual solicitation, either as perpetrator or as victims. Among those who are involved however, a multitude of psychosocial problems are apparent. These include elevated rates of substance use; involvement in offline victimization, and perpetration of relational, physical, and sexual aggression; delinquent peers; propensity to respond to stimuli with anger; poor emotional bonds with caregivers; and poor caregiver monitoring. This is especially true for youth who are involved as perpetrators as well as victims of both Internet harassment and sexual solicitation. This small group of youth has emerged as an especially important group for adolescent health professionals to be aware of, to identify, and to treat or refer into services immediately.

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