

National Trends in Exposure to and Experiences of Violence on the Internet Among Children



WHAT'S KNOWN ON THIS SUBJECT: Technology-mediated exposures (eg, hate sites, death sites) and experiences (eg, bullying) are associated with psychosocial challenge (eg, violent behavior, depressive symptomatology). As more youth move online and gain access to text-messaging, concerns have been raised that victimization rates will increase.



WHAT THIS STUDY ADDS: Internet victimization and perpetration rates, and exposures to violent media, remained constant over time among otherwise similar youth, as did distress rates associated with Internet victimization. In contrast, rates of text-messaging victimization and perpetration rose significantly across the 3 years.

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KEY WORDS

youth, violent media, Internet harassment, unwanted sexual solicitation, unwanted sexual experiences, cyberbullying

ABBREVIATIONS

USE—unwanted sexual experience

aOR—adjusted odds ratio

CI—confidence interval

Dr Ybarra is the principal investigator of the study and made substantial contributions to conception and design, acquisition of data, and analysis and interpretation of data; Drs Mitchell and Korchmaros made substantial contributions to the interpretation of data; Dr Ybarra drafted the article, and Drs Mitchell and Korchmaros revised it critically for important intellectual content; and all authors gave final approval of the version to be published. Each author has participated sufficiently in the work to take public responsibility for appropriate portions of the content.

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abstract

FREE

OBJECTIVE: To examine rates of technology-based violent experiences (eg, bullying, harassment, unwanted sexual experiences [USEs] perpetration, and victimization) and exposures (eg, hate sites) from 2006 to 2008 among US children.

PATIENTS AND METHODS: One thousand five-hundred eighty-eight youth aged 10 to 15 years were surveyed nationally online in 2006, 2007 (76% follow-up rate), and 2008 (73% follow-up rate).

CONCLUSIONS: Ongoing surveillance of text-messaging–based experiences is needed to understand trends as population usage rates begin to stabilize. General technology use is a predictive factor for almost all technology-based violent experiences and exposures. Age is also influential in explaining involvement in Internet-based experiences and exposures. Prevention programs should focus on reducing risk as youth age into later adolescence and to help heavy technology users manage their risk for violence involvement. *Pediatrics* 2011;128:e1376–e1386

With technology becoming ever-more ubiquitous in youths' lives today, appreciation for both the positive¹⁻⁴ and negative influences^{1,5-19} has grown in the research and public policy worlds. Experiences such as online harassment, bullying, and unwanted sexual solicitation victimization and perpetration are associated with psychosocial problems (eg, depressive symptoms, poor caregiver-child relationships, interpersonal victimization offline, social and behavior problems, substance use⁷⁻¹⁸). Exposures such as to violent Web sites (eg, hate sites) are related to violent behavior.²⁰ There is a paucity of information about victimization and perpetration rates over time. Results of a panel study conducted in 2000 and 2005 indicated that rates of Internet harassment victimization increased from 6% to 9%, although unwanted sexual solicitation victimization rates decreased from 19% to 13%.²¹ Increases were explained largely by concurrent increases in Internet use, which suggests that as technology use continues to grow, so too will some types of victimization. Text-messaging-based victimization and Internet perpetration behaviors were not reported.

Although adolescent Internet use rates have stabilized at 93%,²² text-messaging use increased from 51% to 59% between 2006 and 2008.²² As technology use changes in magnitude and context, it is critical for professionals who work with adolescents to monitor shifts in risk affected by these transitions. Only by knowing what the problems are can we identify solutions that reduce the risks and maximize the benefits of technology use.

Using data from the national, longitudinal Growing Up With Media survey, we examined trends in violent experiences and exposures online and via text-messaging from 2006 through 2008. Three questions were examined: (1) Are rates of violent experiences

(eg, harassment) and exposures (ie, "death" Web sites) increasing? (2) Are experiences becoming more distressing? and (3) With age consistently noted as a risk factor for violent experiences and exposures online,^{1,9,19} does age explain any observed rate increases?

PATIENTS AND METHODS

The Growing Up With Media survey measured youths' violent media exposures and the subsequent expression of violent behaviors. Wave 1 (baseline) data were collected from 1588 households with youth aged 10 to 15 years between August and September 2006. Wave 2 data were collected from the same households between November 2007 and January 2008 ($n = 1206$). Wave 3 data were collected again from the same households between August and November 2008 ($n = 1159$). The protocol was approved by the Centers for Disease Control and Prevention Human Subjects Review Board. Harris Interactive (New York, NY) administered the surveys.

Data-Source Sampling Method

Adult respondents were randomly identified from the 4-million-member Harris Poll Online.²³ Eligible caregiver respondents were equally or most knowledgeable about the youth's media use compared with other adults in the household and were able to read English. Youth were randomly identified from the eligible children living in the household at least 50% of the time (according to the adult); stratification goals were based on gender and age. Four strata were created: 10- to 12-year-old boys; 10- to 12-year-old girls; 13- to 15-year-old boys; and 13- to 15-year-old girls.* To ensure some expo-

*In waves 2 and 3, respondents were asked their year of birth and birthday to confirm their identity. As part of this process, 18 youth were identified to be 9 years of age and 12 youth to be 16 years of age at wave 1 (baseline). They were retained in the

sure to the Internet, youth respondents had to have used the Internet in the previous 6 months. Adults completed a 5-minute online survey, and youth completed a 21-minute online survey. Youth received a \$15 gift certificate and caregivers received \$10 for their participation at waves 1 and 2 and \$25 and \$15, respectively, at wave 3.

Survey Respondents

On the basis of survey design, approximately half (51%) of the youth participants were female and had an average age of 12.6 years (range: 10–15) at wave 1 (weighted data, baseline). Seventy-one percent of the youth respondents were white, 14% were black, 9% were of mixed race, and 7% were of other races; 18% of the respondents were Hispanic. Like other nationally representative surveys of youth online,^{2,9,19,24} respondents were slightly less likely to be Hispanic and more likely to report a postgraduate college degree (eg, PhD) in the household or a household income of \$75 000 or more. Differential dropout was not noted by demographic characteristics across waves (Table 1). Age differed significantly over time as the cohort got older. When age was held constant across waves, differential dropout was not apparent (design-based $F_{4,2,6099.9} = 1.80$; $P = .12$).

External and Internal Validity of the Sample

Random-digit-dialing response rates typically seem higher than online response rates because it is impossible

sample, because adults were asked to report the age of their children during the eligibility screen before they knew the study-eligibility criteria. Therefore, there was no reason for parents to purposefully report a different age; rather, we posit that they were rounding up or down for other reasons (eg, forgetfulness, proximal birthday, etc). The findings were similar with and without the inclusion of these 18 youth in the analytical sample. Given their low numbers, they were combined with their peers aged 10 and 15 years, respectively, in wave 1 and across the other 2 waves.

TABLE 1 A Comparison of Demographic Characteristics of Youth Over Time

Youth Characteristic	Wave 1 (2006) (n = 1577), % (n)	Wave 2 (2007) (n = 1189), % (n)	Wave 3 (2008) (n = 1149), % (n)	Statistical Comparison	
				χ^2	P
Biological gender					
Female	51.1 (785)	50.3 (589)	50.8 (568)	Design-based $F_{1.9,3037.0} = 0.32$.71
Male	49.0 (792)	49.7 (600)	49.2 (581)		
Race					
White	71.3 (1155)	73.9 (900)	72.5 (855)	Design-based $F_{4.8,7591.0} = 0.63$.67
Black/African American	13.6 (213)	12.5 (140)	13.6 (145)		
Mixed race	8.6 (113)	7.5 (80)	8.2 (84)		
All others	6.5 (96)	6.1 (69)	5.7 (65)		
Hispanic ethnicity	18.1 (206)	16.7 (144)	16.6 (137)	Design-based $F_{1.9,3025.0} = 1.00$.37
Age, y					
10	16.0 (259)	—	—	Design-based $F_{9.1,14366.7} = 37.0$	<.001
11	15.3 (251)	15.4 (189)	—		
12	17.5 (262)	13.5 (187)	15.9 (194)		
13	15.6 (244)	18.4 (205)	15.8 (192)		
14	18.2 (277)	14.5 (176)	18.4 (200)		
15	17.4 (284)	18.1 (192)	14.3 (161)		
16	—	20.2 (240)	18.4 (201)		
17	—	—	17.3 (201)		
Household income					
Less than \$35 000	25.7 (399)	24.3 (251)	24.8 (241)	Design-based $F_{3.6,5736.0} = 0.74$.55
\$35 000–\$74 999	39.7 (685)	40.1 (525)	38.6 (490)		
\$75 000 or more	34.6 (493)	35.6 (413)	36.7 (418)		

to determine (1) if the e-mail has reached the recipient’s in-box (instead of being sent to a junk-mail box) and (2) if prospective respondents have not checked their e-mail. The response rate was calculated as the number of people who started the survey divided by the number of e-mail invitations sent less any e-mail invitations that bounced back as undeliverable. The wave 1 survey response rate (26%) was within the expected range of well-conducted online surveys.^{25,26} Follow-up response rates were 76% and 73%, respectively.

Measures

All measures referred to the previous 12 months.

Violent Internet Media Exposures

Youth were asked whether they had viewed¹⁹ (1) a “hate” site (promoting hatred of a group of people because of who they are, how they look, or what they believe), (2) a “death” site (pictures of dead people or people dying, or a “snuff” site), (3) a Web site, including news sites, showing pictures of

war, death, or “terrorism,” (4) a Web site (not an online game) showing cartoons, such as stick people or animals, being beaten up, hurt, or killed, or (5) an X-rated or “adult” Web site in which the main topic was sex. Those who answered “yes” to question 5 were asked whether they had “seen a person being physically hurt by another person while they were doing something sexual” in the X-rated Web sites they viewed.

Harassment perpetration and victimization were indicated if youth did (perpetration) or were the target of (victimization) the following: (1) made rude or mean comments^{9,27}; (2) spread rumors, regardless of whether they were true²⁸; or (3) made threatening or aggressive comments. Measures were the same for the Internet and for text-messaging, starting in wave 2.

Starting in wave 2, respondents were asked about bullying victimization²⁹: “We say a young person is being bullied or harassed when someone else or a group of people repeatedly hits, kicks, threatens, or says nasty or unpleasant things to them. Another example is

when no one ever talks to them. These things can happen at school, online, or other places young people hang out. It is not bullying when 2 young people of about the same strength fight or tease each other. How often has this happened to you in the following environments?” (1) at school; (2) on the Internet; (3) on cell phones through text-messaging; (4) on the way to and from school; and (5) somewhere else. We report here bullying done online and via text-messaging.

Unwanted sexual experiences (USEs) were based on items referred to as “unwanted sexual solicitation” in the Youth Internet Safety Surveys.^{9,19} We call these experiences “unwanted sexual experiences” to avoid connotation that these youth were necessarily solicited for sex. A USE victimization was indicated if youth said that (1) someone tried to get me to talk about sex when I did not want to, (2) someone 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 that I did not want to do. A USE perpetration was indicated for youth who reported trying to get someone else to do these things.

A USE via text-messaging was indicated for those who had sent or received a text message (1) that was sexual in any way that was unwanted or a (2) picture text message that was sexual in any way that was unwanted.

Victim Distress

Youth who reported being a victim of Internet harassment or USE were asked to indicate how they felt about their most serious experience (from 1, not at all upset, to 5, extremely upset). Youth who reported being either very or extremely upset were compared with less-affected youth.

General Technology Use

A factor score estimated one's frequency and intensity of Internet and text-messaging use (4 variables): wave 1, eigenvalue = 1.9, factor loadings = 0.52 to 0.83; wave 2, eigenvalue = 1.7, factor loadings = 0.42 to 0.84; and wave 3: eigenvalue = 1.6; factor loadings = 0.38 to 0.82.

Data Cleaning

Data were weighted to reflect adults with children aged 10 to 15 years in the United States on the basis of adult age, gender, race/ethnicity, region, education, household income, and child age and gender.³⁰ Next, survey sampling weights were applied to adjust for adult respondents' self-selection into the Internet-using population and Harris Poll Online^{31–34} and for youth respondents' nonresponse in the 2 follow-up waves. Harris Poll Online data are consistently comparable to data that have been obtained from random telephone samples after sampling and weighting are applied.^{31–34} Missing data and "refused" responses

were imputed by using best-set regression,³⁵ which imputes data on the basis of the best available subset of specified predictors. To reduce the likelihood of imputing variables for truly nonresponsive youth, participants were required to have valid data for at least 85% of the survey questions asked of all youth. Eleven respondents did not meet this criterion and were dropped from the wave 1 sample; 17 were dropped from the wave 2 sample, and 10 were dropped from the wave 3 sample. Participants who did not respond at a previous wave or were excluded from a wave because of missing data were nonetheless invited to participate in subsequent waves. Thus, 3915 observations from 1583 respondents are included.

Statistical Analyses

χ^2 tests adjusted for sampling weights (ie, design-based F statistics) measured statistically significant differences in prevalence rates across the 3 years. A marginal model with generalized estimating equations³⁵ was used to estimate the population-average odds of violent experiences and exposures as a function of individual youth characteristics and time while accounting for clustering in the data within the person over time.

RESULTS

1-Year Prevalence Rates From 2006 to 2008

Exposure rates of almost all violent Web sites differed significantly across the 36 months (Table 2). Most change was attributable to declines in youth reporting that they "did not know" what the Web site was. Nonetheless (and despite being surveyed about these Web sites 1–2 times previously), 41% and 52% of the youth said that they did not know what hate and death sites, respectively, were at wave 3.

Most rates of youth violent experiences online were stable over the 36-month observation period. An exception was harassment-perpetration rates. Prevalence rates for almost all violent experiences via text-messaging-based victimizations increased significantly over time; however, bullying victimization rates seemed to be stable.

When Internet-based violent experiences were examined according to age, overlapping trend lines suggested relatively stable rates across time; rising trend lines suggested rate increases according to age (Figs 1 and 2). Age trends were suggested for text-messaging-based harassment as well (Fig 3), although they were not as obvious for USE (Fig 4). Upward shifts in trend lines for both text-messaging-based harassment and USE suggested that rates might be increasing over time. Bullying rates seemed to increase according to age with less clear time trends for both online and text-messaging experiences (Fig 5).

Youth Characteristics Associated With Violent Exposures Online

After taking youth characteristics into account, rates of exposure to violent Web sites were mostly stable across time (Table 3); an exception was that violent cartoon site exposures decreased significantly. Conversely, age, being male, and general technology use were commonly predictive of increased odds of exposure.

Youth Characteristics Associated With Violent Experiences Online

In almost all cases, the odds of reporting violent experiences were stable over time once youth characteristics were taken into account (see Table 4). Harassment-perpetration rates decreased significantly, however. General technology use was an influential factor for all online experiences. In-

TABLE 2 National Previous-Year Prevalence Rates of Technology-Based Violent Exposures and Experiences Over Time (N = 1588)

Exposures and Experiences and Response	Wave, % (n)			Statistical Comparison	
	Wave 1 (2006)	Wave 2 (2007)	Wave 3 (2008)	χ^2	P
Internet					
Violent Web sites					
Hate sites					
I don't know what this is	56.5 (879)	48.1 (541)	40.7 (452)	Design-based $F_{4,6203} = 11.5$	<.001
I know what this is, but I have not been there	40.9 (658)	49.6 (619)	55.8 (652)		
Yes	2.6 (40)	2.3 (29)	3.5 (45)		
Death sites					
I don't know what this is	65.7 (1030)	57.4 (664)	52.3 (578)	Design-based $F_{4,6132} = 11.5$	<.001
I know what this is, but I have not been there	30.3 (481)	39.2 (483)	44.1 (528)		
Yes	4.0 (66)	3.5 (42)	3.7 (43)		
War, death, and "terrorism" (including news) sites					
I don't know what this is	31.6 (460)	30.3 (315)	27.6 (289)	Design-based $F_{4,6127} = 1.0$.43
I know what this is, but I have not been there	47.1 (749)	47.4 (592)	48.3 (559)		
Yes	21.4 (368)	22.3 (282)	24.1 (301)		
Cartoons sites					
I don't know what this is	43.9 (658)	39.2 (436)	40.7 (428)	Design-based $F_{4,6130} = 5.1$	<.001
I know what this is, but I have not been there	36.7 (588)	44.8 (543)	44.8 (548)		
Yes	19.4 (331)	16.0 (210)	14.5 (173)		
Violent x-rated ("adult") sites					
I don't know what this is ^a	43.1 (673)	35.6 (388)	29.0 (318)	Design-based $F_{4,6232} = 11.1$	<.001
No	55.6 (883)	63.7 (792)	69.3 (811)		
Yes	1.3 (21)	0.7 (9)	1.8 (20)		
Harassment					
Victimization					
Never	67.2 (1074)	65.6 (775)	61.2 (715)	Design-based $F_{7,10814} = 1.3$.25
A few times	25.0 (384)	25.6 (303)	30.0 (339)		
1–2 times per month	4.7 (70)	4.8 (68)	4.8 (47)		
1–2 times per week	2.6 (35)	2.9 (26)	2.7 (32)		
Every day/nearly every day	0.5 (14)	1.2 (17)	1.2 (16)		
Perpetration					
Never	79.4 (1257)	81.1 (941)	76.7 (885)	Design-based $F_{7,11188} = 2.8$.006
A few times	16.8 (269)	16.1 (208)	19.4 (223)		
1–2 times per month	2.0 (27)	1.1 (18)	3.0 (30)		
1–2 times per week	1.6 (20)	1.0 (11)	0.6 (6)		
Every day/nearly every day	0.1 (4)	0.7 (11)	0.2 (5)		
Bullying victimization					
Never	NA	87.5 (1031)	85.3 (968)	Design-based $F_{4,5033} = 1.8$.13
A few times	NA	10.0 (119)	12.3 (150)		
1–2 times per month	NA	1.2 (19)	1.9 (22)		
1–2 times per week	NA	1.0 (11)	0.3 (5)		
Every day/nearly every day	NA	0.4 (9)	0.3 (4)		
USEs					
Victimization					
Never	85.5 (1358)	84.9 (1027)	82.4 (950)	Design-based $F_{7,10580} = 0.8$.56
A few times	11.5 (177)	11.8 (121)	13.0 (154)		
1–2 times per month	1.5 (19)	1.5 (20)	2.9 (29)		
1–2 times per week	1.3 (19)	1.4 (13)	1.3 (9)		
Every day/nearly every day	0.2 (4)	0.4 (8)	0.4 (7)		
Perpetration					
Never	97.3 (1538)	97.2 (1158)	96.7 (1112)	Design-based $F_{6,9971} = 1.5$.17
A few times	1.8 (23)	2.1 (21)	2.9 (31)		
1–2 times per month	0.3 (6)	0.1 (2)	0.2 (2)		
1–2 times per week	0.6 (9)	0.2 (2)	0.2 (3)		
Every day/nearly every day	0.04 (1)	0.3 (6)	0.03 (1)		
Text-messaging^b					
Harassment					
Victimization					
Never	NA	85.6 (996)	75.8 (868)	Design-based $F_{4,4687} = 10.4$	<.001
A few times	NA	11.7 (149)	18.6 (218)		
1–2 times per month	NA	0.8 (19)	3.2 (30)		
1–2 times per week	NA	1.4 (11)	1.4 (19)		
Every day/nearly every day	NA	0.6 (14)	1.1 (14)		

TABLE 2 Continued

Exposures and Experiences and Response	Wave, % (n)			Statistical Comparison	
	Wave 1 (2006)	Wave 2 (2007)	Wave 3 (2008)	χ^2	P
Perpetration				Design-based $F_{4,5007} = 5.1$	<.001
Never	NA	90.0 (1054)	83.9 (973)		
A few times	NA	9.1 (117)	14.0 (152)		
1–2 times per month	NA	0.6 (9)	1.4 (16)		
1–2 times per week	NA	0.2 (4)	0.6 (6)		
Every day/nearly every day	NA	0.2 (5)	0.1 (2)		
Bullying victimization				Design-based $F_{3,3940} = 2.3$.08
Never	NA	93.8 (1116)	91.7 (1054)		
A few times	NA	5.3 (54)	6.6 (74)		
1–2 times per month	NA	0.4 (10)	1.2 (13)		
1–2 times per week	NA	0.3 (3)	0.3 (6)		
Every day/nearly every day	NA	0.3 (6)	0.1 (2)		
USEs					
Victimization				Design-based $F_{7,10,498} = 8.1$	<.001
Never	97.2 (1529)	93.3 (1107)	89.7 (1031)		
A few times	1.4 (30)	3.7 (54)	8.1 (85)		
1–2 times per month	1.0 (8)	1.1 (8)	1.0 (16)		
1–2 times per week	0.2 (3)	1.4 (9)	0.8 (10)		
Every day/nearly every day	0.2 (7)	0.5 (11)	0.3 (7)		
Perpetration					
Never	98.7 (1556)	99.0 (1175)	98.1 (1129)	Design-based $F_{6,9935} = 2.5$.02
A few times	0.6 (13)	0.7 (7)	1.7 (16)		
1–2 times per month	0.0 (0)	0.1 (1)	0.0 (0)		
1–2 times per week	0.6 (7)	0.1 (2)	0.2 (3)		
Every day/nearly every day	0.04 (1)	0.1 (4)	0.03 (1)		

NA indicates not applicable (data not measured in that wave).

^a Includes youth who reported not knowing what an X-rated Web site was (42%, 35%, and 28% in waves 1, 2, and 3, respectively) as well as those who said that they had been to an X-rated Web site but were "not sure" if they had been to a violent X-rated Web site.

^b Rates are population-based and include youth irrespective of cell phone ownership or text-messaging use.

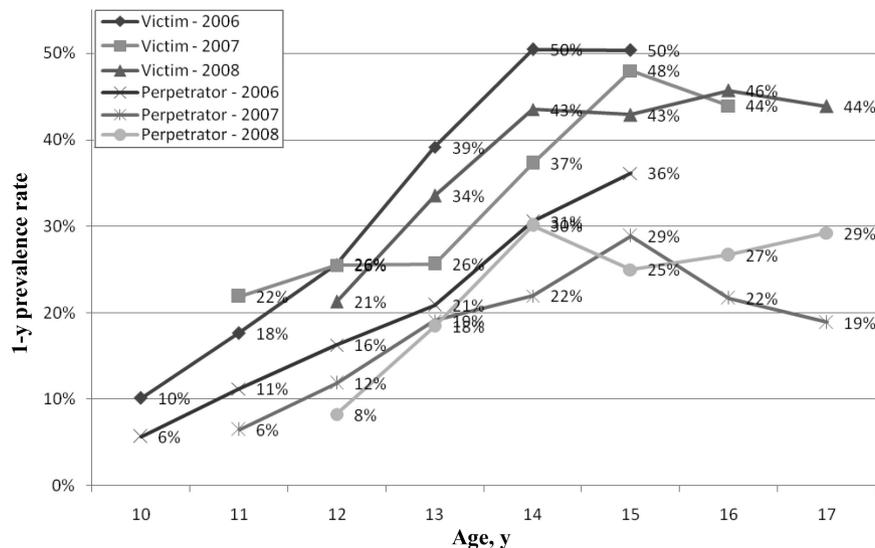


FIGURE 1

Internet-based harassment according to age over a 3-year period in a national sample of 1588 youth.

creasing age also predicted almost all violent online experiences; USE perpetration was the exception. Minority race was protective for all victimization experiences. Biological sex was influential in only 2 cases.

Youth Characteristics Associated With Violent Experiences Via Text-Messaging

Among otherwise similar youth who used text-messaging, rates of harass-

ment victimization and perpetration and USE victimization via text significantly increased over time (Table 5). Similar trends were suggested for bullying victimization. Unlike other violent involvements, age was not predictive of any text-messaging experiences. General technology use continued to be a common thread, however, and was predictive for all types of violent text-messaging experiences. Findings were similar when the same models were run in the entire sample (ie, not restricted to youth who text).

Distress

Among youth who reported Internet harassment victimization, 25% reported feeling very or extremely upset by their most serious incident at wave 1, 25% at wave 2, and 20% at wave 3 ($F_{2,1614} = 1.6$; $P = .21$). Among Internet USE victims, 35% reported feeling very or extremely upset by the most serious incident at wave 1, 36% at wave 2, and 32% at wave 3

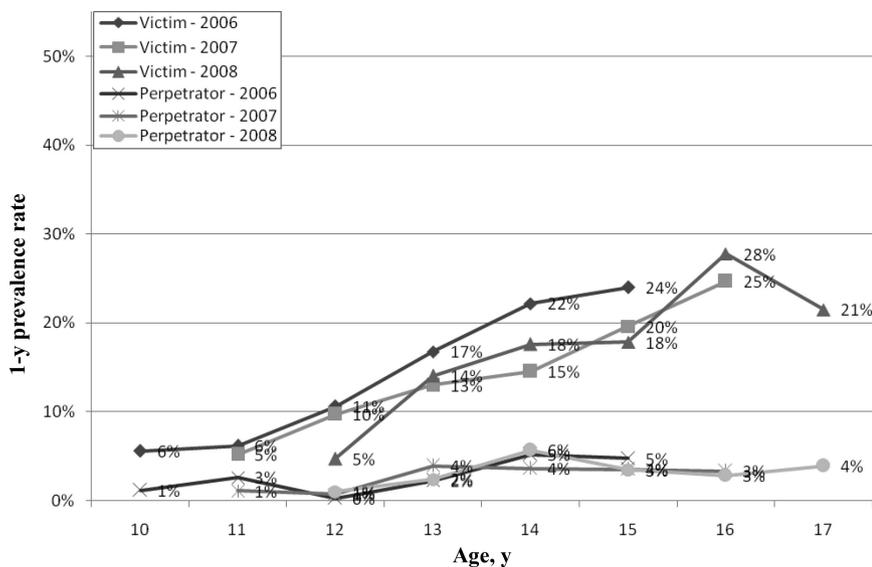


FIGURE 2 Internet-based unwanted sexual experience according to age over a 3-year period in a national sample of 1588 youth.

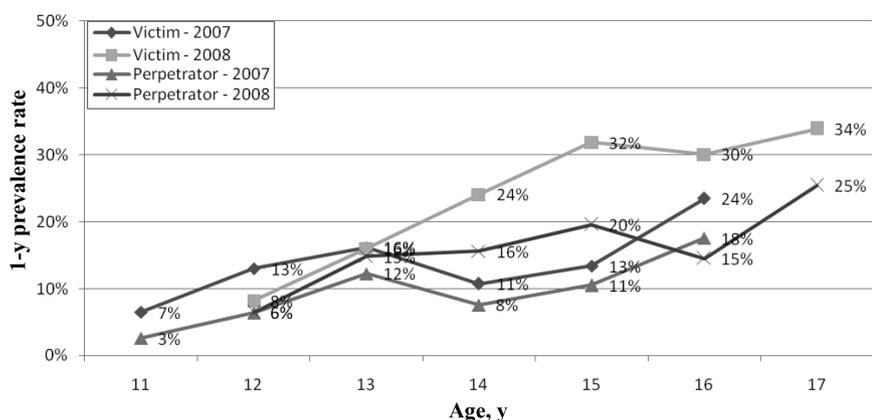


FIGURE 3 Text-messaging-based harassment according to age over a 2-year period in a national sample of 1588 youth.

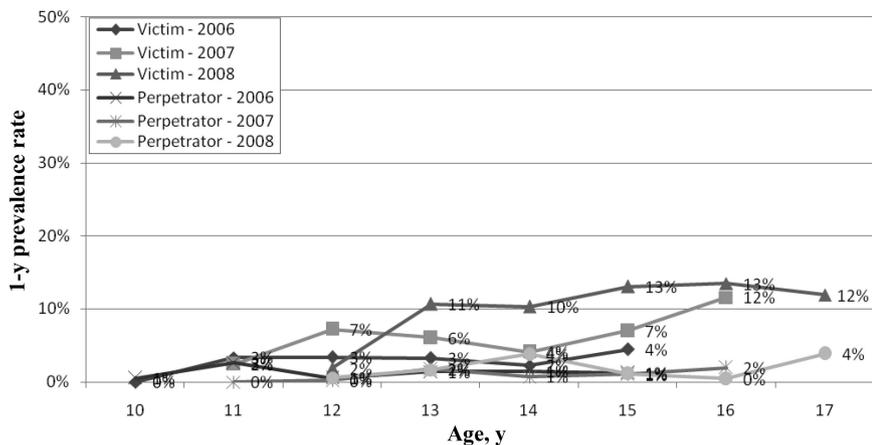


FIGURE 4 Text-messaging-based unwanted sexual experiences according to age over a 3-year period in a national sample of 1588 youth.

($F_{2,789} = 0.2$; $P = .79$). The odds of distress did not change significantly over time when age, biological gender, race and ethnicity, household income, and general technology use were held constant (harassment: wave 2 adjusted odds ratio [aOR]: 1.08 [95% confidence interval (CI): 0.77–1.52; and wave 3 aOR: 0.91 [95% CI: 0.61–1.38]; USE: wave 2 aOR: 1.20 [95% CI: 0.67–2.16]; wave 3 aOR: 1.07 [95% CI: 0.59–1.93]).

DISCUSSION

With media attention focused on Internet dangers posed to youth, it is easy to assume that increases in youths' use of technologies are mirrored by increases in harmful exposures and experiences. The current data suggest otherwise with respect to the Internet. Among otherwise similar youth, rates of online victimization and perpetration and exposures to violent Web sites largely held constant from 2006 and 2008. Significant decreases in harassment perpetration and violent cartoon site exposures were exceptions. Maybe the plethora of prevention messages about digital citizenship and Internet safety are working.^{36,37} Maybe, too, as new online tools lose their novelty more extreme behaviors become less titillating.

In direct contrast, many text-messaging-based violent experiences (ie, harassment victimization and perpetration, USE victimization) have increased. This may be related to increased text-messaging use.³⁸ Indeed, partly related to the affordability of unlimited plans and the ease of instantaneous communication no matter where one is physically, text-messaging is fast becoming the primary communication tool for the majority of adolescents.³⁸ It also is possible that text is more conducive to quick exchanges that can typify harassment, bullying, and USE. Certainly, filtering and parental control software commonly on computers to block unwanted exposures and language that can fuel violent experiences

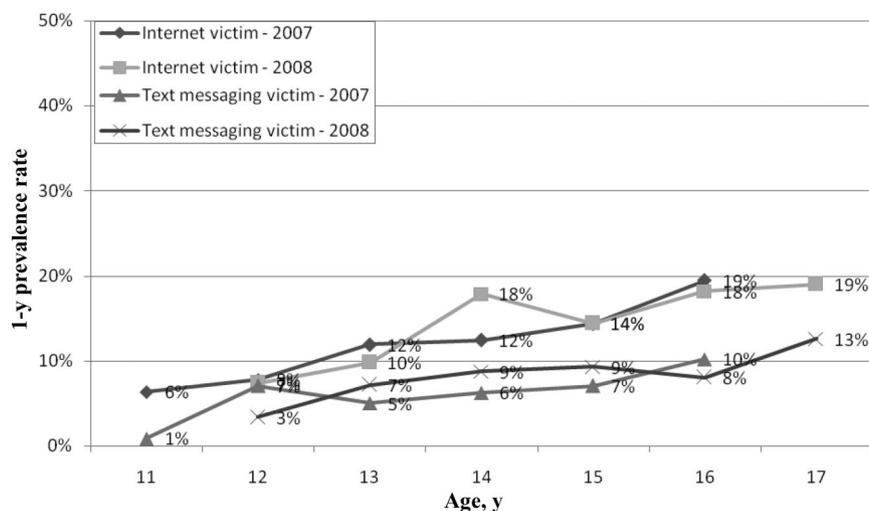


FIGURE 5 Internet- and text-messaging–based bullying victimization according to age over a 2-year period in a national sample of 1588 youth.

have not yet reached the same level of penetration on cell phones.

Concerns that mass numbers of youth will expose themselves to deviant things on the Internet simply because they can are not supported by the data. Indeed, even when informed about hate and death sites at the current and

previous waves of the survey, many youth at wave 3 said that they did not know what the survey was asking about. This finding suggests that it takes more than availability and knowledge to get young people to visit violent Web sites. It is possible that youth who visit these types of violent

Web sites have a wider range of psychosocial and behavioral problems that make them more inclined to seek out such material. Baseline data from this cohort suggest that visiting hate and satanic sites are associated with significantly elevated odds of seriously violent behavior.⁵ Research that sheds light on whether, how, and under what circumstances such exposures trigger adverse responses in youth is needed. Our findings suggest that general technology use and age are important factors in predicting risk for violent exposures and experiences online. Adolescence is a time of significant change and transformation throughout many areas of life,^{39–41} including technology use. Older adolescents have a fairly sophisticated understanding of the social complexities of the Internet,⁴² and many of them engage in complex and highly interactive Internet use.⁴³ This usage has implications not only for positive experiences, including increased access to important

TABLE 3 Relative Odds of Reporting Violent Exposures Online Over Time in a National Sample of Children and Adolescents (N = 1588)

Survey characteristic	Hate Sites		Death Sites		War, Death, and "Terrorism" (News) Sites		Violent Cartoon Sites		Violent X-Rated "Adult" Sites	
	aOR (95% CI)	P	aOR (95% CI)	P	aOR (95% CI)	P	aOR (95% CI)	P	aOR (95% CI)	P
Time										
Wave 1 (2006)	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—
Wave 2 (2007)	0.70 (0.38–1.27)	.24	0.74 (0.46–1.20)	.22	0.89 (0.70–1.13)	.32	0.76 (0.59–0.97)	.03	0.44 (0.18–1.09)	.08
Wave 3 (2008)	0.96 (0.48–1.90)	.90	0.65 (0.41–1.02)	.06	0.85 (0.66–1.10)	.21	0.64 (0.48–0.86)	.003	0.89 (0.37–2.19)	.81
Personal characteristic										
Age	1.17 (0.99–1.38)	.06	1.16 (1.01–1.34)	.04	1.19 (1.11–1.27)	<.001	1.04 (0.96–1.12)	.39	1.25 (0.98–1.60)	.07
Male gender	0.72 (0.41–1.28)	.27	1.35 (0.80–2.28)	.26	1.26 (0.99–1.60)	.06	2.45 (1.87–3.21)	<.001	2.40 (1.03–5.58)	.04
Hispanic ethnicity	1.24 (0.54–2.87)	.61	1.19 (0.67–2.11)	.55	1.07 (0.78–1.46)	.69	0.71 (0.47–1.06)	.09	0.60 (0.21–1.67)	.33
Race										
White	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—
Black/African American	1.16 (0.56–2.39)	.68	1.27 (0.65–2.47)	.48	0.68 (0.46–0.99)	.05	1.18 (0.81–1.71)	.39	1.33 (0.42–4.18)	.63
Mixed race	1.85 (0.65–5.27)	.25	1.08 (0.54–2.16)	.82	1.06 (0.69–1.62)	.81	1.36 (0.92–1.99)	.12	2.94 (0.94–9.19)	.06
All other	1.57 (0.65–3.81)	.32	2.64 (1.32–5.27)	.006	0.77 (0.49–1.22)	.27	1.56 (1.02–2.40)	.04	2.39 (0.79–7.25)	.12
Household income										
Less than \$35 000	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—
\$35 000–\$75 000	1.47 (0.73–2.96)	.28	1.28 (0.73–2.23)	.39	1.18 (0.87–1.59)	.28	1.21 (0.89–1.65)	.22	0.93 (0.40–2.17)	.87
More than \$75 000	1.29 (0.60–2.76)	.51	1.27 (0.62–2.60)	.51	1.45 (1.05–2.00)	.02	1.31 (0.92–1.88)	.13	0.67 (0.26–1.77)	.42
General technology use	1.54 (1.21–1.97)	<.001	1.32 (1.05–1.66)	.02	1.04 (0.93–1.18)	.48	1.24 (1.09–1.42)	.001	1.11 (0.71–1.71)	.65
Survey process measures										
Self-reported dishonesty	0.65 (0.15–2.81)	.57	2.02 (1.01–4.04)	.05	1.24 (0.76–2.03)	.38	1.05 (0.63–1.76)	.84	2.02 (0.51–7.99)	.32
Not alone during the survey	0.55 (0.32–0.93)	.03	0.73 (0.46–1.17)	.20	0.86 (0.70–1.05)	.14	0.85 (0.67–1.07)	.16	0.67 (0.32–1.45)	.31

Each model shown across the horizontal axis is adjusted for all variables shown at the left. RG indicates reference group.

TABLE 4 Relative Odds of Reporting Violent Experiences Online Over Time in a National Sample of Children and Adolescents (N = 1588)

Survey characteristic	Harassment				Bullying Victimization		USEs			
	Victimization		Perpetration		aOR (95% CI)	P	Victimization		Perpetration	
	aOR (95% CI)	P	aOR (95% CI)	P			aOR (95% CI)	P	aOR (95% CI)	P
Time										
Wave 1 (2006)	1.00 (RG)	—	1.00 (RG)	—	NA	—	1.00 (RG)	—	1.00 (RG)	—
Wave 2 (2007)	0.86 (0.70–1.06)	.16	0.70 (0.55–0.88)	.002	1.00 (RG)	—	0.80 (0.61–1.05)	.11	0.93 (0.46–1.88)	.85
Wave 3 (2008)	0.89 (0.70–1.14)	.36	0.74 (0.57–0.97)	.03	1.05 (0.79–1.41)	.73	0.79 (0.58–1.08)	.14	1.10 (0.57–2.13)	.78
Personal characteristic										
Age	1.23 (1.14–1.31)	<.001	1.24 (1.15–1.34)	<.001	1.17 (1.06–1.30)	.002	1.27 (1.16–1.39)	<.001	1.05 (0.87–1.26)	.64
Male gender	0.83 (0.66–1.06)	.13	0.76 (0.58–1.00)	.05	0.80 (0.56–1.13)	.20	0.58 (0.43–0.79)	.001	1.32 (0.74–2.36)	.34
Hispanic ethnicity	0.87 (0.60–1.26)	.47	0.79 (0.53–1.17)	.24	0.89 (0.51–1.53)	.67	1.40 (0.86–2.28)	.17	1.02 (0.49–2.12)	.97
Race										
White	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—
Black/African American	0.48 (0.33–0.69)	<.001	0.87 (0.55–1.39)	.57	0.54 (0.29–0.98)	.04	0.57 (0.36–0.88)	.01	0.88 (0.42–1.84)	.73
Mixed race	0.68 (0.47–0.99)	.04	0.94 (0.54–1.62)	.81	0.59 (0.27–1.27)	.17	0.64 (0.38–1.09)	.10	1.09 (0.40–2.95)	.87
All other	0.77 (0.47–1.27)	.31	0.81 (0.50–1.32)	.40	0.99 (0.52–1.89)	.97	0.45 (0.25–0.79)	.005	0.98 (0.37–2.59)	.97
Household income										
Less than \$35 000	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—
\$35 000–\$75 000	0.96 (0.72–1.29)	.80	1.08 (0.79–1.48)	.63	1.31 (0.84–2.05)	.24	0.98 (0.66–1.45)	.92	0.67 (0.33–1.37)	.27
More than \$75 000	1.20 (0.88–1.65)	.25	0.99 (0.69–1.42)	.97	0.96 (0.60–1.52)	.86	0.99 (0.65–1.52)	.97	0.97 (0.47–2.01)	.94
General technology use	1.75 (1.56–1.96)	<.001	1.47 (1.30–1.66)	<.001	1.29 (1.07–1.55)	.008	1.46 (1.30–1.64)	<.001	2.07 (1.51–2.85)	<.001
Survey process measure										
Self-reported dishonesty	1.31 (0.76–2.25)	.33	0.90 (0.55–1.47)	.68	1.34 (0.68–2.64)	.40	1.37 (0.67–2.80)	.38	3.05 (1.41–6.59)	.005
Not alone during the survey	0.87 (0.72–1.05)	.15	0.76 (0.61–0.94)	.01	0.86 (0.62–1.18)	.35	0.85 (0.66–1.09)	.19	0.39 (0.22–0.67)	0.001

Each model shown across the horizontal axis is adjusted for all variables shown at the left. NA indicates not applicable (bullying was not queried in wave 1); RG, reference group.

TABLE 5 Relative Odds of Reporting Violent Experiences Via Text-Messaging Over Time in a National Sample of Children and Adolescents Who Send or Receive Text Messages

Survey characteristic	Harassment				Bullying Victimization		USEs			
	Victimization		Perpetration		aOR (95% CI)	P	Victimization		Perpetration	
	aOR (95% CI)	P	aOR (95% CI)	P			aOR (95% CI)	P	aOR (95% CI)	P
Time										
Wave 1 (2006)	NA	—	NA	—	NA	—	1.00 (RG)	—	1.00 (RG)	—
Wave 2 (2007)	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.27 (0.80–2.02)	.31	0.70 (0.24–2.06)	.51
Wave 3 (2008)	1.63 (1.23–2.15)	.001	1.44 (1.03–2.01)	.03	1.50 (0.99–2.27)	.06	1.89 (1.09–3.28)	.02	1.70 (0.58–4.94)	.33
Personal characteristic										
Age	1.07 (0.95–1.19)	.27	1.05 (0.93–1.19)	.42	1.05 (0.89–1.23)	.56	1.01 (0.87–1.17)	.90	0.83 (0.61–1.12)	.22
Male gender	0.92 (0.63–1.36)	.69	0.71 (0.48–1.06)	.10	0.85 (0.49–1.49)	.57	1.04 (0.65–1.66)	.88	1.58 (0.66–3.82)	.31
Hispanic ethnicity	1.15 (0.65–2.01)	.63	0.64 (0.38–1.09)	.10	1.02 (0.49–2.11)	.97	1.60 (0.90–2.85)	.11	1.52 (0.52–4.41)	.44
Race										
White	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—
Black/African American	0.73 (0.39–1.38)	.34	0.67 (0.35–1.28)	.23	0.59 (0.25–1.38)	.22	1.76 (0.93–3.30)	.08	0.45 (0.10–2.08)	.31
Mixed race	0.78 (0.36–1.66)	.51	1.04 (0.47–2.30)	.93	1.86 (0.78–4.41)	.16	1.06 (0.53–2.12)	.86	1.39 (0.36–5.31)	.63
All other	0.67 (0.33–1.36)	.27	0.78 (0.35–1.74)	.54	0.99 (0.38–2.58)	.99	1.77 (0.80–3.88)	.16	0.60 (0.11–3.24)	.55
Household income										
Less than \$35 000	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—	1.00 (RG)	—
\$35 000–\$75 000	1.25 (0.77–2.03)	.37	1.33 (0.78–2.25)	.29	0.98 (0.49–1.94)	.95	1.03 (0.56–1.90)	.92	0.61 (0.22–1.67)	.34
More than \$75 000	1.13 (0.67–1.88)	.65	1.24 (0.73–2.11)	.42	0.77 (0.38–1.56)	.46	1.28 (0.71–2.31)	.41	0.97 (0.34–2.73)	.95
General technology use	1.90 (1.47–2.45)	<.001	1.65 (1.25–2.17)	<.001	2.49 (1.71–3.61)	<.001	1.89 (1.39–2.57)	<.001	3.29 (2.23–4.85)	<.001
Survey process measure										
Self-reported dishonesty	0.91 (0.44–1.86)	.79	0.71 (0.32–1.59)	.40	1.47 (4.51–4.23)	.47	1.25 (0.57–2.75)	.58	0.97 (0.13–7.28)	.98
Not alone during the survey	0.71 (0.51–0.99)	.04	0.74 (0.52–1.05)	.09	0.82 (7.49–1.41)	.48	0.86 (0.58–1.27)	.45	0.24 (0.06–0.91)	.04

Each model shown across the horizontal axis is adjusted for all variables shown at the left. Three hundred eighty-one youth in wave 1, 533 in wave 2, and 680 in wave 3 reported owning a cell phone and text-messaging. NA indicates not applicable (bullying was not queried in wave 1); RG, reference group.

health information and bonded friendships with supportive people, but also for negative experiences and exposures. Professionals who work with adoles-

cents need to take into account the young person's place in his or her social development when trying to understand online behaviors and experiences.

As measured by self-reported distress, victimization does not seem to be getting nastier or more intense. Rates of those who are very or extremely upset

by their most serious victimization in the last year held steady over the 36-month observation period. As adults, we often assume that our own fears for our children are mirrored by those of the children themselves. It could be, however, that our concerns of how traumatic these online experiences are for most youth are overstated. At the same time, it is important to recognize that 1 in 4 youth report feeling strongly and negatively affected by their victimization experience. Adolescent health professionals need to be ready to assist these youth in whatever ways we can. For example, helping youth role-play responses to a potential online victimization while in a safe environment might reduce some of the potential distress.^{44–46}

LIMITATIONS

Our findings should be interpreted within the following limitations. Rates of text-messaging skyrocketed from 59% in 2008% to 72% in 2009.²² It is possible that this increase affected a change in victimization and perpetration rates that are not measured in the current study. Second, measures for Internet versus text-messaging experiences were not exactly parallel. Preva-

lence rates should not be directly compared across technology types.

CONCLUSIONS

Data do not support the hypothesis that violent exposures (eg, hate sites) or experiences (eg, harassment, bullying, USE) online have increased in recent years. This is also true of rates of distress for those who are victimized online. Increases in text-messaging-based experiences, however, were noted, which might be because Internet access rates have largely stabilized, whereas text-messaging access rates continue to increase and change the profile of users. It also could be because text-messaging has rapidly become a salient communication tool of choice for many young people, creating a shift of interactivity from online to text. Perhaps the Internet findings bode well for text-messaging rates once usage stabilizes; ongoing surveillance is warranted. In all cases, adolescent health professionals must wrestle with 2 “competing” realities. First, similar to other forms of victimization, technology-based bullying, harassment, and unwanted sexual encounters can be distressing for the youth who experience them. We need to

do a better job of identifying these youth and getting them into services (eg, therapy). Second, we need to recognize that the majority of youth are not being victimized online, and the majority of them who are victimized are not seriously upset by it. Thus, we need to be appropriately concerned but, at the same time, help parents, politicians, and professionals who work with youth to not be unnecessarily alarmed.

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National Trends in Exposure to and Experiences of Violence on the Internet Among Children

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