

# Association of Maltreatment With High-Risk Internet Behaviors and Offline Encounters



**WHAT'S KNOWN ON THIS SUBJECT:** Ninety-five percent of American adolescents have Internet access, and 80% use online social networking sites. Current understanding of high-risk Internet behaviors, including exposures to sexually explicit content, provocative social networking profiles, sexual solicitations, and offline encounters, has not kept pace.



**WHAT THIS STUDY ADDS:** Substantiated maltreatment emerged as a unique risk factor for adolescents' high-risk Internet behaviors. The moderating influence of parenting quality and monitoring was also explicated. Findings will enhance media literacy programs to promote the safe and optimal use of the Internet.

## abstract



**OBJECTIVE:** High-risk Internet behaviors, including viewing sexually explicit content, provocative social networking profiles, and entertaining online sexual solicitations, were examined in a sample of maltreated and non-maltreated adolescent girls aged 14 to 17 years. The impact of Internet behaviors on subsequent offline meetings was observed over 12 to 16 months. This study tested 2 main hypotheses: (1) maltreatment would be a unique contributor to high-risk Internet behaviors and (2) high-quality parenting would dampen adolescents' propensity to engage in high-risk Internet behaviors and to participate in offline meetings.

**METHODS:** Online and offline behaviors and parenting quality were gleaned from 251 adolescent girls, 130 of whom experienced substantiated maltreatment and 121 of whom were demographically matched comparison girls. Parents reported on adolescent behaviors and on the level of Internet monitoring in the home. Social networking profiles were objectively coded for provocative self-presentations. Offline meetings with persons first met online were assessed 12 to 16 months later.

**RESULTS:** Thirty percent of adolescents reported having offline meetings. Maltreatment, adolescent behavioral problems, and low cognitive ability were uniquely associated with high-risk Internet behaviors. Exposure to sexual content, creating high-risk social networking profiles, and receiving online sexual solicitations were independent predictors of subsequent offline meetings. High-quality parenting and parental monitoring moderated the associations between adolescent risk factors and Internet behaviors, whereas use of parental control software did not.

**CONCLUSIONS:** Treatment modalities for maltreated adolescents should be enhanced to include Internet safety literacy. Adolescents and parents should be aware of how online self-presentations and other Internet behaviors can increase vulnerability for Internet-initiated victimization. *Pediatrics* 2013;131:e510–e517

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### KEY WORDS

abuse, adolescent sexual behavior, internet, victimization, path analysis

### ABBREVIATION

CPS—Child Protective Services

Dr Noll conceptualized and designed the study, drafted the initial manuscript, formulated and executed the analytic plan, and approved the final manuscript as submitted; Dr Shenk contributed substantially to the analytic plan, contributed text to several sections of the manuscript, helped develop the assessment tools, developed the coding scheme, performed the objective coding, reviewed the manuscript, and approved the final manuscript as submitted; Dr Barnes contributed substantially to the text the manuscript, contributed to the design of the study and in developing the coding scheme, performed the objective coding, coordinated and supervised the data collection, helped develop the assessment tools, reviewed the manuscript, and approved the final manuscript as submitted; and Dr Haralson contributed substantially to the development of the coding scheme, performed the objective coding, reviewed the manuscript, and approved the final manuscript as submitted.

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National survey data indicate that 95% of American adolescents aged 12 to 17 years have access to the Internet, and 80% use social networking sites such as MySpace or Facebook.<sup>1</sup> Social networking sites can provide valuable opportunities for adolescents to explore novel aspects of social discourse and expand social contexts. These sites also allow adolescents to post personal photos and autobiographic information. Some adolescents choose to post provocative images or sexual utterances that can inadvertently signal an interest in, or a readiness for, sexual discourse. A recent youth survey revealed that 30% of profiles on social networking sites contained at least 1 sexual self-disclosure or sexual message.<sup>2</sup> Thirty-two percent of adolescents report having been contacted online by someone with no connection to them or their friends.<sup>3</sup> Research on perpetrators of Internet-initiated sex crimes revealed that social networking sites are indeed a means by which perpetrators contact minors to arrange offline encounters.<sup>4</sup> The wide availability of the Internet also provides adolescents unprecedented access to sexual images and sexually explicit materials. Although the extent to which pornography exposure adversely affects adolescent development is currently under debate,<sup>5,6</sup> such exposure can contribute to sexual scripts that mold sexual behaviors.<sup>7</sup> The identification of unique risk factors and subpopulations of adolescents engaging in high-risk Internet behaviors that are related to subsequent adverse outcomes holds considerable promise in the promotion of optimal Internet safety.

Adolescents who have been maltreated (ie, experienced physical abuse, sexual abuse, or neglect) may be at increased risk of high-risk Internet behaviors because studies show that they are more likely to receive sexual solicitations<sup>8,9</sup> and

choose provocative self-presentations.<sup>10</sup> The experience of maltreatment may disrupt biological, cognitive, affective, and behavioral regulatory processes involved in recognizing and responding to social cues that heighten risk of revictimization.<sup>11</sup> There are a host of factors that cooccur with maltreatment that are likewise associated with high-risk Internet behaviors, such as depression, substance use, externalizing behavior, and poverty.<sup>8,12–14</sup> To date, no single study includes a comprehensive set of adolescent risk factors, so it is unclear whether maltreatment confers unique risk for adolescent Internet use or whether maltreatment merely serves as a proxy for other indicators. Such research will be an important first step in enhancing treatment modalities for maltreatment victims. Moreover, the identification of moderating factors that reduce the risk posed by maltreatment would be useful for prevention and intervention.

Internet safety programs (eg, onguardonline.gov, safekids.com, NetSmart.org) rely heavily on parental monitoring to promote safe Internet use. Yet, only 30% to 50% of households consistently use parental control devices, and many adolescents have access to the Internet outside the home (eg, friends' homes, smartphones, etc).<sup>15,16</sup> Moreover, parental control software and other filtering technology may have little impact on online sexual solicitations<sup>17</sup> or on other risky online behaviors such as talking to strangers.<sup>18</sup> Overall, parental presence and the quality of the parental relationship might be more effective in reducing risky Internet use than sole reliance on parental control software or other filtering technologies.<sup>10</sup> Adolescents who have been maltreated report low-quality parental relationships and live predominantly in single-parent households.<sup>19,20</sup> Thus, the ability for parents to monitor media use and effectively communicate about

Internet risk behaviors may be especially impaired in these households.

This study had 3 major objectives: (1) after accounting for other known adolescent risk factors, to test the hypothesis that maltreatment is uniquely associated with increased rates of high-risk Internet behaviors defined as the viewing of sexual content, creating provocative social network profiles, and receiving online sexual solicitations; (2) to test a multivariate model elucidating adolescent risk variables that are independently associated with subsequent offline, in-person encounters with persons first met online; and (3) to test the hypotheses that parenting quality and level of Internet and media supervision in the home would moderate the prevalence of high-risk Internet behaviors and the impact of high-risk Internet behaviors on subsequent offline encounters.

## METHODS

### Sample Recruitment

Participants were 256 girls aged 14 to 17 years. Maltreated girls ( $n = 133$ ) were eligible if (1) they had experienced maltreatment that was substantiated by local Child Protective Services (CPS) agencies within the past 12 months and (2) they had resided within the same home environment for  $\geq 12$  months. Maltreatment was defined as physical neglect, physical abuse, and/or sexual abuse. CPS agency providers identified eligible families who were then contacted by study staff via mail to ascertain interest in participation. Maltreatment type was distributed as follows: sexual abuse (43%), physical abuse (37%), and physical neglect (20%). Comparison girls were recruited from a hospital-based adolescent health center through posted flyers. These girls were demographically matched to at least 1 maltreated adolescent on race, family income, age, and family constellation

(1- or 2-parent households). Comparison girls were screened and excluded in light of confirmed childhood maltreatment via statewide screening of CPS records. Of those who were contacted, 18% of the maltreated adolescents and 20% of comparison adolescents indicated that they were either no longer interested or they failed to attend their initial interview and were not enrolled. The mean age of the sample was 15.8 years ( $SD = 1.13$ ), the mean household income was \$40 000 to \$50 000 ( $SD = \$17\ 350$ ), 51% of households were single parent, and the sample was 55% white, 37% African American, and 8% mixed race.

## Procedures

The study had full approval from the Institutional Review Board of the Cincinnati Children's Hospital Medical Center. All data were collected in the research laboratory. At time 1, caregivers (75% biological mother, 6% biological father, 5% step/adoptive parent, 10% other family member, and 4% other guardian/foster parent;  $P =$  not significant across groups) reported on adolescent behaviors and on parental presence and media supervision in the home. Adolescents completed questionnaires via multimedia computers to maximize anonymity. Assessments included Internet use/behaviors, sexual attitudes and activities, alcohol/substance use, parenting quality, and depressive symptoms. Cognitive ability was assessed via standardized testing. Adolescents also logged on to their preferred social networking site and accessed their publicly available profile pages, which were printed for later content coding. Ninety-eight percent of the sample was retained for a repeat assessment of Internet use/behaviors at time 2, which occurred ~12 to 16 months after time 1 with no attrition bias by group. Hence, the final sample size for longitudinal analyses was 251 (130 maltreated, 121

comparison). Adolescents and caregivers received monetary compensation for their time.

## Adolescent Risk Variables

Depressive symptoms were measured via the 10-item Center for Epidemiologic Studies–Depression scale, which has established reliability and validity<sup>21</sup> ( $\alpha = .74$  in the current sample; range: 10–29; mean  $\pm$  SD: 15.51  $\pm$  4.10). High-risk behaviors (nonsexual) were measured via a single composite of adolescent and peer substance use combined with externalizing behaviors (overall  $\alpha = .89$ ). Adolescent and peer substance use was defined via 8 summed items (4 for the adolescent and 4 for her closest peer) obtained from the Monitoring the Future national survey questionnaires<sup>22</sup> and included currently being a regular smoker (1 = yes, 0 = no) combined with the number of reported alcohol, marijuana, and illegal drug intoxications over the past year (range: 0–15; mean  $\pm$  SD: 5.98  $\pm$  4.61). Externalizing behaviors were assessed via caregiver reports on the Child Behavior Checklist<sup>23</sup> (raw score range: 2–49; mean  $\pm$  SD: 19.23  $\pm$  9.43). High-risk sexual attitudes were measured via 15 items (each on a 1-to-5 scale), excerpted from the Sexual Attitudes and Activities Questionnaire,<sup>24</sup> assessing sexual preoccupation, being “turned on” by pornographic pictures or sexual themes, and having intrusive thoughts about sex ( $\alpha = .91$ ; range: 16–69; mean  $\pm$  SD: 35.22  $\pm$  10.11). The Sexual Attitudes and Activities Questionnaire also assesses risky sexual behaviors as a composite of the number of the following: (1) sexual behaviors including unprotected intercourse, 1-night stands, sex while under the influence of alcohol/drugs, and HIV risk; (2) sexually transmitted infections; and (3) sexual intercourse partners in the past year (range: 0–25; mean  $\pm$  SD: 5.56  $\pm$  12.34). Sexual attitudes and behaviors were combined into

a single composite for analyses ( $\alpha = .89$ ). Cognitive ability was assessed via the Brief Intellectual Ability composite of the Woodcock-Johnson III<sup>25</sup> (range: 73–128; mean  $\pm$  SD: 88.33  $\pm$  11.05).

## Parent Variables

Parenting quality was measured by a linear combination of 2 broad constructs: (1) caregiver reports of parental presence excerpted from the AddHealth survey,<sup>26</sup> which measures caregiver presence at mealtimes, before school, after school, and at bedtime (range: 5–36; mean  $\pm$  SD: 26.44  $\pm$  6.75), and (2) adolescent reports of parental attachment, which consisted of 16 items for each parent from the Inventory of Parent and Peer Attachment.<sup>27</sup> The average of both parents was used in 2-parent households, and the 1 residing parent was used in 1-parent households (range: 24–80; mean  $\pm$  SD: 56.13  $\pm$  13.67). The overall parenting quality composite yielded an  $\alpha$  equal to .91.

## Internet Risk Variables

A set of 20 self-report items were derived for the current study to assess Internet risk behaviors. With possible responses ranging from 0 = “strongly disagree” to 4 = “strongly agree,” exploratory factor analysis revealed 7 items measuring Unintentional Exposure to Sexual Content ( $\alpha = .89$ ; range: 0–22; mean  $\pm$  SD: 4.32  $\pm$  5.23; eg, “People send me links to pornographic websites even if I don't ask them to”) and 7 items measuring Intentional Exposure to Sexual Content ( $\alpha = .82$ ; range: 0–23; mean  $\pm$  SD: 3.69  $\pm$  4.68; eg, “I like going to websites that include sexual stuff”). Three items measured Parental Monitoring of Internet Use ( $\alpha = .81$ ; range: 0–12; mean  $\pm$  SD: 6.41  $\pm$  2.88; eg, “My parents are aware of the kinds of websites I visit”). Parental Control Computer Software was measured via a 1 = “yes,” 0 = “no” item: “The

computer I use most in my home has a parental control device installed that limits the kinds of Internet sites that I am allowed to visit." Online sexual solicitations were assessed via responses to the question, "How often have you had sexual advances from people online?", with possible responses ranging from 0 = "never" to 4 = "very often." Offline meetings were assessed via responses to the question, "How many times have you met someone in person who you first met online?", with responses ranging from 0 = "never" to 4 = "5 or more times."

### High-Risk Social Network Profile

While in the laboratory, participants logged on to their publicly available social networking profile page, which at the time of the assessment in 2008–2009 were exclusively MySpace pages. Profile pages were printed, all identifying information was blacked out, and profiles were objectively coded by 3 trained, blinded raters. User-added profile pictures, text content, profile narratives, and other user-added photos/images were coded for the following: (1) personal identifying information (eg, full names, school names, phone numbers); (2) sexually

provocative photos, utterances, or images (eg, profile picture in lingerie, self-descriptors such as "will go all the way"); and (3) references to smoking, alcohol or substance use, profanity, or violence/aggressiveness (eg, "flipping the bird"). Codes consisted of "0" for no occurrence, "1" for occurring once, or "2" for occurring twice or more. There was a total of 9 items (range: 0–16; mean  $\pm$  SD: 2.56  $\pm$  2.51). Interrater reliability was obtained on 25% of overlapping codes, yielding a Kendall's *W* of .79, which indicated good agreement.

### Analytic Plan

After a series of maltreatment versus comparison group difference tests (Table 1), path analysis was used to assess associations between time 1 adolescent risk factors and Internet risk behaviors and whether these variables predicted offline meetings at time 2 (Fig 1). In post hoc analyses, the moderating influences of the 3 parent variables were examined via serial regressions within the multivariate system of the original path model (Fig 2). Age, minority status, and family income level were covaried in all equations. To control for

previous time effects, time 1 offline meetings was an additional covariate in the equation predicting time 2 offline meetings.

## RESULTS

As shown in Table 1, maltreated girls showed significantly higher levels of depressive symptoms, more high-risk nonsexual behaviors, lower levels of cognitive ability, and poorer parenting quality. Maltreated girls also reported a greater propensity toward unintentional exposures to sexual content on the Internet, high-risk social network profiles, and online sexual solicitations. Twenty percent of the total sample reported experiencing at least some online sexual solicitations, and 30% reported meeting at least 1 person offline whom they first met online. The path model of Fig 1 fit the data well. The figure shows the most parsimonious model in that significant pathways were retained and nonsignificant pathways were fixed to zero. Maltreatment accounted for unique variability in unintentional exposure to sexual content, high-risk social network profiles, and online sexual solicitations after accounting for the other risk factors. In turn, time

**TABLE 1** Summary Statistics and Maltreated Versus Comparison Group Differences

	Total (N = 251)	Maltreated (n = 130)	Comparison (n = 121)	F Value df (1, 246)
Depression, CES-D-10 score	14.8 $\pm$ 3.9	16.9 $\pm$ 4.3	12.6 $\pm$ 3.7	7.14**
High-risk behaviors (nonsexual) <sup>a</sup>	0 $\pm$ 1	0.19 $\pm$ 1.02	-0.20 $\pm$ 0.83	10.37**
High-risk sexual attitudes and behaviors <sup>a</sup>	0 $\pm$ 1	0.04 $\pm$ 0.91	-0.12 $\pm$ 0.85	1.77
Cognitive ability <sup>b</sup>	89.3 $\pm$ 12.1	87.8 $\pm$ 11.6	91.6 $\pm$ 12.3	6.61**
Unintentional exposure to sexual content <sup>a</sup>	0 $\pm$ 1	0.20 $\pm$ 1.03	-0.11 $\pm$ 0.89	5.95*
Intentional exposure to sexual content <sup>a</sup>	0 $\pm$ 1	0.14 $\pm$ 1.02	0.04 $\pm$ 0.84	0.24
High-risk social network profiles <sup>a</sup>	0 $\pm$ 1	0.26 $\pm$ 1.06	-0.28 $\pm$ 0.84	19.40**
Online sexual solicitations <sup>c</sup>	0.30 $\pm$ 0.66	0.41 $\pm$ 0.74	0.19 $\pm$ 0.59	4.79*
Offline meetings (time 2) <sup>d</sup>	0.49 $\pm$ 0.87	0.49 $\pm$ 0.81	0.50 $\pm$ 0.94	0.13
Parenting quality <sup>a</sup>	0 $\pm$ 1	-0.19 $\pm$ 1.09	0.16 $\pm$ 0.87	9.61**
Parental monitoring of Internet use <sup>a</sup>	0 $\pm$ 1	0.02 $\pm$ 0.97	-0.12 $\pm$ 0.97	0.80
Parental control software installed, %	32	30	34	0.24

Data are presented as means  $\pm$  SD or percentages. Age, minority status, and family income level covaried. CES-D-10, 10-item Center for Epidemiologic Studies–Depression scale; *df*, degree of freedom.

<sup>a</sup> Standard scores (mean = 0; SD = 1) presented to enhance interpretability due to the composite nature of the total score.

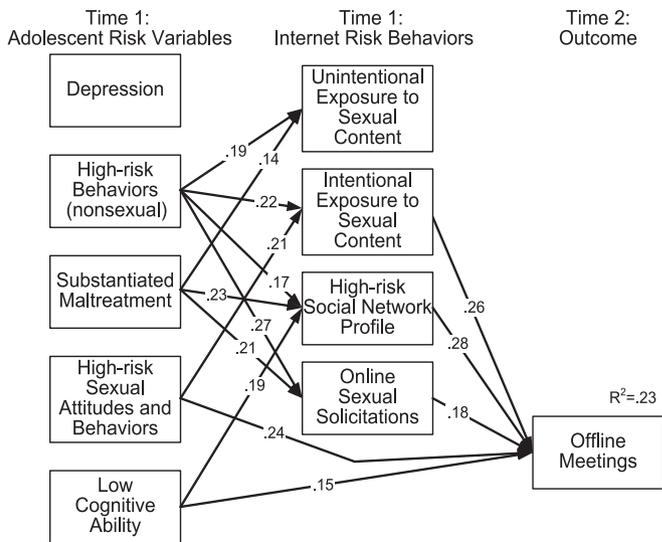
<sup>b</sup> Scaled on population standard score norms (population mean = 100; SD = 15).

<sup>c</sup> Possible range of 0 to 4 with 0 = "never" to 4 = "very often."

<sup>d</sup> Possible range of 0 to 4 with 0 = "never" to 4 = "5 or more times."

\*  $P < .05$ .

\*\*  $P < .01$ .



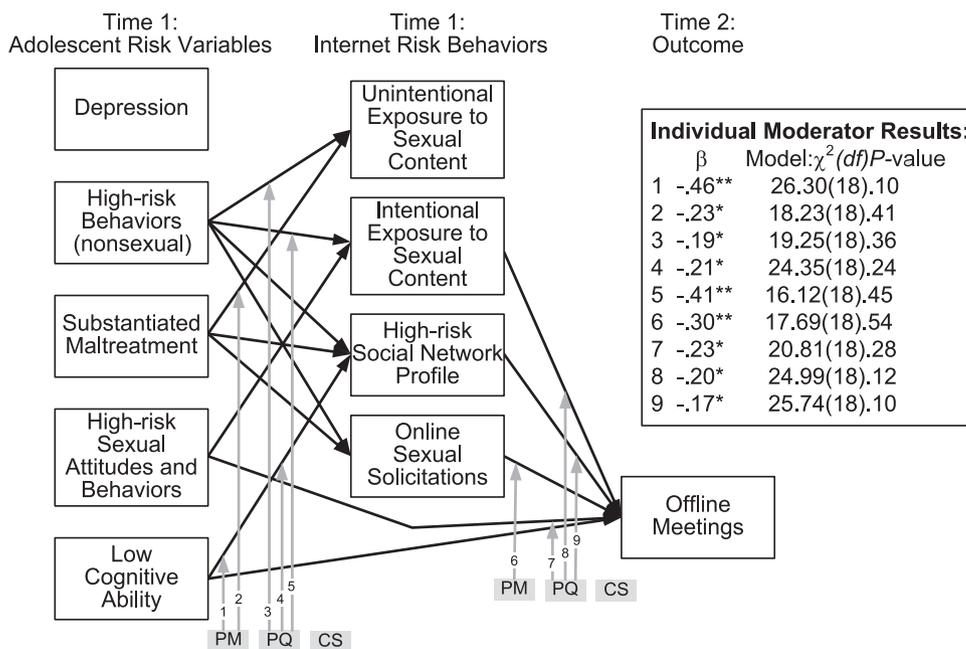
Model Fit:  
 $\chi^2(10) = 12.54, P = .56$ ;  
 CFI = .97, SRMSR = .02

**FIGURE 1**

Path analysis of adolescent risk variables associated with high-risk Internet behaviors and subsequent offline meetings. Direct paths represent significant, positive standardized  $\beta$  parameter estimates at  $P < .05$ . Nonsignificant paths are not shown. Correlations within adolescent risk variables and within high-risk Internet behaviors were freely estimated (not shown). Age, minority status, and income level were controlled in all equations. CFI, Comparative Fit Index; SRMSR, Standardized Root Mean Square Residual.

2 offline meetings were predicted by time 1 intentional exposure to sexual content, high-risk social network profiles, online sexual solicitations, high-risk sexual attitudes and behaviors, and low cognitive ability. Post hoc analyses revealed no significant differences in path coefficients according to maltreatment type.

Figure 2 shows the serial tests of the moderating variables. Parental monitoring of Internet/media moderated the relationship between maltreatment and unintentional exposure to sexual content (path 2). With regard to offline meetings, parental monitoring moderated previous online sexual solicitations (path 6), and parenting quality moderated previous high-risk sexual attitudes and behaviors (path 7), intentional exposure (path 8), and high-risk social network profiles (path 9). Parental control software did not function as a moderator for any relationship within the multivariate



**FIGURE 2**

The moderating effects of parental monitoring (PM), parenting quality (PQ), and parental control computer software (CS) on pathways to high-risk Internet behaviors and offline meetings.  $*P < .05$ ,  $**P < .01$ . Gray arrows represent significant interactions of predictors with hypothesized moderators. Age, minority status, and income level were controlled. All moderators were tested individually in sequential post hoc analyses within the original Mplus model of Fig 1. Only significant moderating paths are shown. The "Individual Moderator Results" box shows  $\beta$  parameter estimates for all significant moderators, plus the overall model fit resulting from each being added to the equation in Fig 1. None of the 9 moderating effects resulted in any significant degradation of model fit. *df*, degrees of freedom.

system. All significant moderator paths were negative, which indicated that high scores on the parenting variable coupled with high scores on the independent variable resulted in low scores on the dependent variable.

## DISCUSSION

Today's youth are unique because of their unprecedented online access.<sup>28</sup> Social networking sites are commonly used and can facilitate interpersonal relationships that can enhance healthy adolescent development. These sites can provide important access to role models and support systems that adolescents may not have in their offline social circles. Although the majority of online interactions are benign,<sup>29</sup> contact with a person whose identity has not been confirmed can be a dangerous situation for adolescent girls. Many adolescents do not possess the necessary skills to ward off sexual advances whether online or in person. The identification of factors that increase the risk of such contact can illuminate important ways to promote safe Internet use for at-risk youth. Results from this study indicate that maltreatment poses a unique risk for online behaviors that may set the stage for harm: namely, creating a provocative social networking profile and receiving online sexual solicitations, both of which predicted subsequent offline meetings with unknown individuals. Protective service and child advocacy providers should be aware that maltreated adolescents might require additional, proactive guidance and monitoring with regard to their Internet use and online behaviors. Trauma treatments should specifically target motivations for provocative online self-presentations and the propensity to engage in sexual solicitations. The high revictimization rates of maltreatment victims have received much attention in recent years.<sup>30</sup> The

risk of Internet-initiated victimization should be likewise included in this category of concern.

Results also indicate that, in general, adolescents may not be aware that posting provocative photos or autobiographic information can signal that they might be willing to engage in sexual conversations or consider an offline meeting. As such, parents and adolescents should remain vigilant about self-presentations and should be aware of who has access to their private information. Only 58% of adolescents in the current study reported enacting privacy settings that allowed only "friends" to view full profiles. This low rate of privacy enactment likely reflects an underlying naivety when approaching both privacy settings and Internet use in general. At the time of this assessment (2008–2009) MySpace was by far the preferred social networking venue for adolescents. Facebook now harbors the majority of social networking traffic and has instituted a host of choices for privacy settings, which can prevent strangers from viewing private photos and extended narratives. Although this trend toward privacy is gaining momentum, it should be noted that default privacy settings are only minimally restrictive and require the user to actively choose settings that restrict access by strangers. Moreover, technology is ever-evolving, and new venues to share personal information continually emerge (eg, Instagram).

Limitations included the exclusively female sample, so our results do not necessarily extend to boys. Adolescent behavior was obtained via self-report, and it is likely that some high-risk behaviors are underreported due to social desirability. Results should be interpreted in light of the fact that this was a high-risk sample of maltreated and nonmaltreated girls and therefore

findings cannot be generalized to the larger adolescent population. Accordingly, parents, practitioners, and policy makers should not be overly alarmed by some results, which are somewhat higher than in more normative samples<sup>31</sup> (eg, 30% of adolescents in this sample agreed to an offline meeting). The sample was also limited to older adolescents, and it is unclear how Internet risk might be characterized for younger adolescents. For some 17-year-olds, sexual solicitation might be more normative because this is an age when many adolescents begin to explore sexuality, whereas such behavior in a 12-year-old would be more concerning. Hence, the developmental stage and emotional maturity of each adolescent should be taken into account whenever risk is evaluated. Finally, maltreated adolescents did not differ from comparison adolescents with respect to offline meetings, a finding that is inconsistent with the other Internet risk findings. However, as is suggested by other prevalence statistics,<sup>29</sup> it is likely that only a few of these offline meetings actually resulted in victimization, and this finding may not be reflective of previous research linking maltreatment to high rates of other types of revictimization.<sup>30</sup>

## CONCLUSIONS

Internet safety and sex education programs should highlight the implications for provocative self-presentations, offer skills for handling sexual solicitations, and recommend ways to protect adolescents whose parents are not Internet savvy or who are otherwise uninvolved. Pediatric practitioners can encourage media literacy in parents and can caution parents to be more active in, and informed about, the online lives of their children. Providers can best serve patients who have a history of childhood maltreatment by

recommending increased monitoring and by enhancing treatments to address online behaviors. Parental monitoring and quality can help reduce high-risk Internet behaviors. Internet safety campaigns, such as those currently delivered in middle and high schools, are ideal venues in which to increase the media literacy of parents and to provide adolescents with the

knowledge and skills to field sexual solicitations. Parents should be encouraged to use tools that go beyond simply installing filtering devices. Such tools include engendering open lines of communication with regard to online and offline practices and targeting problem behaviors that can lead to Internet risk behaviors. In this way, parents and adolescents can work to-

gether to promote the safe and optimal use of the Internet.

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