

Adolescents' Exposure to Sexually Explicit Material on the Internet

Jochen Peter
Patti M. Valkenburg
University of Amsterdam

Drawing on a survey of 745 Dutch adolescents ages 13 to 18, the authors investigated (a) the occurrence and frequency of adolescents' exposure to sexually explicit material on the Internet and (b) the correlates of this exposure. Seventy-one percent of the male adolescents and 40% of the female adolescents had been exposed to some kind of online sexually explicit material in the 6 months prior to the interview. Adolescents were more likely to be exposed to sexually explicit material online if they were male, were high sensation seekers, were less satisfied with their lives, were more sexually interested, used sexual content in other media more often, had a fast Internet connection, and had friends that were predominantly younger. Among male adolescents, a more advanced pubertal status was also associated with more frequent exposure to online sexually explicit material. Among female adolescents, greater sexual experience decreased exposure to online sexually explicit material.

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More than any other medium, the Internet is a sexual medium. It is swamped with sexually explicit material (Cooper, Scherer, Boies, & Gordon, 1999; Freeman-Longo, 2000), that is, material "which depicts sexual activity in obvious, unconcealed ways" (Kelley, Dawson, & Musialowski, 1989, p. 58). The Internet also offers numerous applications to engage in so-called cybersex, that is, suggestive or explicit erotic messages or sexual fantasies that are exchanged with others via the computer. Sex-related words rank consistently at the top of terms used in search engines (Cooper et al., 1999; Freeman-Longo, 2000; Goodson, McCormick, & Evans, 2001). Most important, sexuality on the Internet is easily accessible, affordable (if not free), and anonymous.

This triple-A engine of accessibility, affordability, and anonymity of online sexually explicit material (Cooper, 1998) has sparked public concerns about adolescents' exposure to such material (Paul, 2004; Runkel, 2005). These concerns may be justified. First, adolescents use the Internet extensively, usually with distinct computing

skills (Madden & Rainie, 2003). Second, first-time exposure to offline sexually explicit material usually occurs in adolescence (Bryant & Brown, 1989), and this may also apply to exposure to online material. Third, adolescents are curious about sexuality and frequently search for sexual stimulation (for review, see Savin-Williams & Diamond, 2004). Adolescents, then, seem to be predestined to be exposed to sexually explicit material on the Internet. By exposure, we mean the active, conscious consumption of sexually explicit material as opposed to the passive, accidental contact with such material.

Scholars from various disciplines have repeatedly called for research on adolescents' exposure to sexually explicit material on the Internet (Brown, 2000; Fisher & Barak, 2001; Goodson et al., 2001; Thornburgh & Lin, 2002). However, research has predominantly dealt with adolescents' exposure to R-rated sex, usually on television (e.g., Greenberg et al., 1992; for review, see Ward, 2003). With the exception of a recent U.S. study by Ybarra and Mitchell (2005), we know little about the extent to which adolescents expose themselves to sexually explicit material on the Internet. It is the first goal of this study to help further fill this research gap. Investigating the extent to which adolescents expose themselves to sexually explicit material on the Internet may provide an important baseline for all research on the sexual socialization of adolescents.

Both sex and media researchers have emphasized that individuals select media and sexual content that is congruent with their dispositions (Bogaert, 2001; Fisher & Barak, 2001; Ruggiero, 2000). This can also be assumed for adolescents' exposure to sexually explicit material online. Depending on specific background characteristics, some adolescents may consume sexually explicit material on the Internet whereas others may avoid it. However, we know little about individual differences in adolescents' exposure to sexually explicit material on the Internet. More importantly, research has only begun to study which characteristics of adolescents are related to the exposure to sexually explicit material online (Ybarra & Mitchell, 2005). Therefore, it is the second goal of this study to deepen our understanding of the correlates of adolescents' exposure to sexually explicit material on the Internet. In this study, we specifically investigate adolescents' exposure to sexually explicit pictures, sexually explicit movies or movie clips, and erotic contact sites. Erotic contact sites can be assumed to be at least partly sexually explicit (Lamb, 1998).

This study was conducted in the Netherlands, a country often cited for its progressive approach toward matters of adolescent sexuality (e.g., Unicef, 2001). A pragmatic, open attitude toward contraception accompanied by high income equality and a high percentage of 15- to 19-year-olds enrolled in education is seen as the main reason for one of the lowest teenage birth and abortion rates in the developed world (e.g., Unicef, 2001). Furthermore, the Netherlands is frequently mentioned as an example of having a liberal policy toward issues about sexually explicit material (Drenth & Slob, 1997).

Although Dutch adolescents grow up in a sexually tolerant environment, it would be somewhat premature to speak of a Dutch exceptionalism in terms of adolescent

sexuality. Korea, Japan, Switzerland, and the Scandinavian countries have equally low or even lower teenage birth rates than the Netherlands, with the Scandinavian countries having pursued policies toward contraception similar to those of the Netherlands (Unicef, 2001). Swedish and Danish legislation toward the production, availability, and possession of sexually explicit material is comparable to Dutch legislation. Most importantly, rich western and northern European countries and the United States have undergone similar societal changes in the past 40 years or so (Unicef, 2001). This has led to several commonalities in the development of adolescent sexual behavior in these countries, such as a median age of about 17 at coital debut, the tendency to have sex at an earlier age (although there seems to be a reversal of that tendency in the United States; see Centers for Disease Control, 2002), and the predominant occurrence of sex in a premarital context (Bozon, 2003; see also the articles in Francoeur, 1997). These developments suggest that for a group of western and northern European countries and the United States, within-country differences regarding issues of adolescent sexuality may be bigger than between-country differences. Therefore, we think that this study may not only be relevant to an assessment of Dutch adolescents' exposure to sexually explicit material but may also have implications for research done in other western and northern European countries and in the United States.

Occurrence and Frequency of Adolescents' Exposure to Sexually Explicit Material on the Internet

Figures about adolescents' exposure to sexually explicit material on the Internet diverge. A study conducted in Taiwan in 2001 found that 38% of adolescents had surfed the Internet for sexually explicit material (Lo & Wei, 2005), whereas a U.S. study carried out in 1999 and 2000 reported that 8% of the 10- to 17-year-olds surveyed looked intentionally for sexually explicit material on the Internet (Ybarra & Mitchell, 2005). In another U.S. study among college students done in 1998, 59% of the men and 33% of the women reported that they accessed sexually explicit material on the Internet, although the majority said that they rarely did so (Goodson et al., 2001). The divergent results may derive from different conceptual and operational definitions of exposure to online sexually explicit material. Differences in sampling techniques and samples, interviewing modes, and places and periods of investigation may also have caused the discrepant figures. Additionally, given the massive increase of adolescents' Internet access in the past 5 years, the aforementioned figures render it difficult to specify to what extent adolescents expose themselves to sexually explicit material on the Internet. Therefore, our first research question simply asked the following:

Research Question 1: To what extent do adolescents expose themselves to sexually explicit material on the Internet?

Correlates of Adolescents' Exposure to Sexually Explicit Material on the Internet

In their media practice model, Steele and Brown (Brown, 2000; Steele, 1999; Steele & Brown, 1995) have emphasized, among other things, that adolescents' exposure to (sexual) media content is an active, conscious process. Steele and Brown (1995) link adolescents' selection of (sexual) media content to at least three groups of variables: (a) demographics (e.g., gender, ethnicity) as proxies for underlying socio-cultural variables, (b) developmental characteristics (e.g., pubertal status, sexual experience), and (c) social context variables (e.g., parental control, religiosity, peer culture). Related studies from communication research (e.g., Greenberg et al., 1992), adolescence research (e.g., Ybarra & Mitchell, 2005), social and developmental psychology (e.g., Barak, Fisher, Belfry, & Lashambe, 1999; Collins et al., 2004; Goodson et al., 2001), and sexology (e.g., Vanwesenbeeck, 2001) suggest that adolescents' exposure to online sexually explicit material may be associated with two more groups of variables: (d) personality characteristics, such as sensation seeking, and (e) media use characteristics, such as exposure to sexual content in media other than the Internet. Informed by Steele and Brown's media practice model and an interdisciplinary approach to the issue, we will specify in the following paragraphs hypotheses about how the concepts in the five groups may be related to adolescents' exposure to sexually explicit material.

Demographics. In line with the media practice model (Brown, 2000; Steele, 1999; Steele & Brown, 1995), we will investigate gender, age, and ethnicity as demographics.

Both among adults and among adolescents, males have been found to be more likely to expose themselves to sexually explicit material than females (Buerkel-Rothfuss, Strouse, Pettey, & Shatzer, 1992; Goodson et al., 2001; Stack, Wasserman, & Kern, 2004). This pattern was also confirmed for adolescents' exposure to sexually explicit material on the Internet (Cameron et al., 2005; Lo & Wei, 2005; Ybarra & Mitchell, 2005). Therefore, we hypothesized the following:

Hypothesis 1a: Male adolescents will expose themselves to sexually explicit material more often than female adolescents.

With respect to the influence of age on the exposure to sexually explicit material, recent research has shown that older adolescents are more likely to consume sexually explicit material on the Internet than younger adolescents (Cameron et al., 2005; Ybarra & Mitchell, 2005). As a result, we hypothesized the following:

Hypothesis 1b: Older adolescents will expose themselves to sexually explicit material on the Internet more frequently than younger adolescents.

Ethnicity generally affects sexual activities and exposure to sexual content (Greenberg et al., 1992; Wright & Weise, 1997). In the Netherlands, the main ethnic difference is between the Dutch majority and a minority of largely Turkish, Moroccan, Antillean, and Surinamese origin. However, it is unknown whether and how these groups differ in their exposure to online sexually explicit material. As a result, we asked the following:

Research Question 2: To what extent do Dutch and non-Dutch adolescents differ in their exposure to sexually explicit material on the Internet?

Developmental characteristics. As to developmental characteristics, we investigate pubertal status and sexual experience. As the media practice model outlines, media use in general and exposure to sexual content in particular change as children mature into adolescence (Steele & Brown, 1995). The fact that sexuality becomes an important issue in adolescence results from the hormonal changes during the period, which in turn define adolescents' pubertal status (Brown, Halpern, & L'Engle, 2005). The pubertal status of adolescents is related to their sexual activities: As adolescents' pubertal development progresses, so do their sexual activities (Miller, Christopherson, & King, 1993). We assume that this pattern also applies to adolescents' exposure to sexually explicit material online. Consequently, we hypothesized the following:

Hypothesis 2a: Adolescents whose pubertal status is more advanced will expose themselves to sexually explicit material on the Internet more frequently than adolescents whose pubertal status is less advanced.

There is tentative evidence that adolescents' actual sexual experience is positively linked to greater exposure to sexual content, particularly on television (Brown & Newcomer, 1991; Collins et al., 2004; Strouse & Buerkel-Rothfuss, 1987; for review, see Ward, 2003). We therefore hypothesized the following:

Hypothesis 2b: With increasing sexual experience, adolescents will expose themselves to sexually explicit material online more frequently.

Social context variables. The media practice model puts emphasis on the socializing role of family, religion, and peers in adolescents' lives and conceptualizes these variables as important influences on adolescents' exposure to sexual content (Steele, 1999; Steele & Brown, 1995). As a result, we study as social context variables parental monitoring, religiosity, the age of adolescents' friends, and adolescents' relationship status. Parental monitoring reduces adolescents' exposure to sexual content on television (Collins et al., 2004). This pattern may also emerge if parents check what their children are doing on the Internet. Therefore, we hypothesized the following:

Hypothesis 3a: Adolescents will expose themselves to sexually explicit material on the Internet less frequently if parents monitor their children's activities on the Internet more closely.

Religiosity has been found to reduce adolescents' exposure to sexual content on TV (Collins et al., 2004; Greenberg et al., 1992) and adults' exposure to online pornography (Stack et al., 2004). Our hypothesis read as follows:

Hypothesis 3b: Adolescents will expose themselves to sexually explicit material less often when they are religious.

Peers, both in terms of peer groups and in terms of a romantic partner, affect adolescents' sexual development (e.g., Miller et al., 1993; Santor, Messervey, & Kusumakar, 2000). Regarding the peer group, the age of the friends may play a crucial role. Whereas adolescents with predominantly older friends may be confronted more often with people with more elaborate sexual experiences, adolescents with predominantly younger friends may more frequently meet people with less elaborate sexual experiences. As a result, adolescents with predominantly younger friends may be more inclined to use the media as a substitute sexual peer than adolescents with predominantly older friends (Brown et al., 2005). In line with recent results by Collins and associates (2004), we therefore hypothesized the following:

Hypothesis 3c: Adolescents with predominantly younger friends will expose themselves to sexually explicit material on the Internet more often than adolescents with predominantly older friends.

The influence of a romantic relationship on adolescents' sexual development has been well documented (e.g., Herold & Marshall, 1996; Miller et al., 1993). The formation of a romantic relationship is an important experience for adolescents (Furman & Wehner, 1994), not least because of a heightened likelihood to have sex (Miller et al., 1993). This opportunity to have sex along with the experience of intimacy may decrease adolescents' curiosity about sexually explicit material. As a result, we hypothesized the following:

Hypothesis 3d: Adolescents who are not in a romantic relationship will expose themselves to online sexually explicit material more often than adolescents who are in a romantic relationship.

Personality characteristics. This group of potential correlates of adolescents' exposure to online sexually explicit material includes sensation seeking, life satisfaction, and sexual interest. Adolescents with a high need for sensation are typically more strongly involved in sexual activities than adolescents with a low need for sensation (Savin-Williams & Diamond, 2004). Sensation seekers also tend to search more often for sexual content than non-sensation seekers (Collins et al., 2004; Vanwesenbeeck, 2001). We thus hypothesized the following:

Hypothesis 4a: Adolescents' exposure to sexually explicit material increases with a stronger need for sensation.

Adolescents and young adults with high life troubles and depression tend to engage more often in problematic Internet use, partly to escape from their dissatisfying lives, partly to compensate for what they miss in real life (Wolak, Mitchell, & Finkelhor, 2003). Moreover, adolescents who encounter problems in their lives (e.g., delinquency, substance use) are more likely to look for sexually explicit material online than other adolescents (Ybarra & Mitchell, 2005). We therefore hypothesized the following:

Hypothesis 4b: Adolescents will expose themselves to sexually explicit material on the Internet more frequently if they are dissatisfied with their lives.

Because of differences in sexual socialization and/or differences in bodily or emotional development, adolescents' sexual interest may vary (Miller et al., 1993). By sexual interest, we mean the extent to which adolescents are eager to find out and think about sexual matters. Thus, sexual interest refers to adolescents' cognitive involvement with sex and sexuality. Collins et al. (2004) have recently suggested adding the concept of sexual interest to future studies on sex and the media. According to these authors, including sexual interest in the analysis may help to better understand and to more rigorously test the potential relationship between standard variables, such as gender and age, and exposure to sexually explicit material on the Internet. Moreover, integrating sexual interest in studies on adolescents' exposure to online sexually explicit material may provide some first insights into a potential relationship between exposure to online sexually explicit material and adolescents' involvement with sexual matters. On the basis of evidence from related fields that interest in a particular issue increases media exposure to that issue (McLeod, Kosicki, & McLeod, 2002), we hypothesized the following:

Hypothesis 4c: Stronger sexual interest will be positively linked to adolescents' exposure to sexually explicit material on the Internet.

Media use characteristics. Adolescents may look for sexual content not only on the Internet but also in magazines, on videotapes, on television, or on DVDs (Buerkel-Rothfuss et al., 1992; Greenberg et al., 1992). Experience with sexual material in media other than the Internet seems to be generally related to online exposure to sexually explicit material (Barak et al., 1999; Lo & Wei, 2005). As a result, we hypothesized the following:

Hypothesis 5a: Adolescents will expose themselves to sexually explicit material on the Internet more frequently if they also expose themselves to sexual content in other media.

We also include the frequency of Internet use at home and the speed of the Internet connection as potential correlates of exposure to sexually explicit material on the Internet. If adolescents use the Internet more frequently, they may also be more famil-

iar with the sexual content available on the Internet. Consequently, we hypothesized the following:

Hypothesis 5b: Exposure to sexually explicit material on the Internet increases as adolescents access the Internet more frequently.

The speed of an Internet connection may affect whether adolescents are able to conveniently access sexually explicit material online, particularly movie clips. Consequently, we hypothesized the following:

Hypothesis 5c: Adolescents with a fast Internet connection will expose themselves to sexually explicit material on the Internet more often than adolescents with a slow Internet connection.

Gender Differences

In the preceding paragraphs, we did not specify whether the expected correlates of exposure to online sexually explicit material would differ for male and female adolescents. Existing research on the exposure to sexually explicit material is predominantly concerned with men. Therefore, it does not offer a sound theoretical basis for substantiating why correlates of exposure to sexually explicit material on the Internet may differ for male and female adolescents. However, the consistent finding of gender differences in exposure to online sexually explicit material (Cameron et al., 2005; Goodson et al., 2001; Lo & Wei, 2005; Ybarra & Mitchell, 2005) suggests that it may be worth investigating whether these differences also extend to the correlates of the exposure to such material. Research Question 3 aims at identifying potential gender differences:

Research Question 3: Do the correlates of exposure to sexually explicit material on the Internet differ for male and female adolescents?

Method

Sample and Procedure

In March and April 2005, an online survey was conducted of 745 adolescents between 13 and 18 years of age. For the study of sensitive issues, online surveys or, more generally, computer-mediated surveys have generally proven superior to other modes of interviewing (e.g., Mustanski, 2001). Sampling and fieldwork were done by Intomart GfK, the Netherlands. Respondents were recruited from an existing online panel managed by Intomart GfK. Intomart GfK had sampled the respondents in all parts of the Netherlands, partly through random telephone interviews, partly through respondents' social networks. The response rate of our study was 60%. Analyses showed that the gender, age, and formal education of our respondents did not deviate

from official statistics. It should be noted that in terms of ICT, the Netherlands is one of the most advanced countries in the world. Already in 2003, 90% of Dutch adolescents had home access to the Internet, and this figure can be assumed to have increased since then (Sociaal en Cultureel Planbureau, 2005). As a result, the Netherlands seems a country very well suited to detect developments that may occur in other countries in coming years.

Prior to the implementation of the survey, institutional approval, parental consent, and adolescents' informed consent were obtained. Adolescents were notified that the study would be about sexuality and the Internet and that they could stop at any time they wished. Of the 745 adolescents who started the questionnaire, 690 fully completed it. Various background variables, such as gender, age, formal education, ethnicity, and Internet use (but not their name and contact information), were known from all respondents who started the questionnaire. As a result, we could test whether those who completed the questionnaire differed from those who did not. We did not find any significant differences between the two groups.

We took the following measures to improve the confidentiality, privacy, and anonymity of the answering process (Binik, Mah, & Kiesler, 1999; Mustanski, 2001). On the introduction screen of the online questionnaire, we emphasized that the answers would be analyzed only by us, the principal investigators. Moreover, respondents were asked to make sure that they filled in the questionnaire in privacy. Finally, we ensured the respondents that their answers remained anonymous. That is, we explained explicitly that there was no possibility for the principal investigators to identify who had filled in the questionnaire and that, Intomart GfK could not see what the respondents answered. Intomart GfK did not link respondents' answers in our questionnaire to their names and contact information and only provided us with the background variables plus the answers to our questionnaire. This procedure has proven successful in various other studies on sensitive issues and ensures the protection of respondents' anonymity. Completing the questionnaire took about 15 to 20 min.

Measures: Exposure to Sexually Explicit Material on the Internet

Operationalization. Based on research on the wording of sensitive questions (Bradburn, Sudman, & Wansink, 2004), the question on the exposure to sexually explicit material on the Internet read, "Sex sites are among the most often visited sites on the Internet. Some teenagers use the sexual content of such sites, while other teenagers don't. Would you please indicate how often you looked at the following sexual content on the Internet on average in the last six months? We would like to remind you that all your answers remain anonymous." The sexual content we referred to were (a) pictures with clearly exposed genitals, (b) movies with clearly exposed genitals, (c) pictures in which people are having sex, (d) movies in which people are having sex, and (e) erotic contact sites. Pretests revealed that adolescents did not need more elaborate explanations and were aware that this question and the pertinent items were about sexually explicit content and their purposeful exposure to them. (The preceding ques-

tion in the questionnaire was about random exposure to sexually explicit material online.) The response categories were 1 (*never*), 2 (*less than once a month*), 3 (*1 to 3 times a month*), 3 (*once a week*), 5 (*several times a week*), and 6 (*every day*).

When we planned the investigation, there were no published studies that we could have used to learn about the time frame of the question and the range of the response categories. Asking respondents about how often they typically engage in certain sexual activities without specifying a time period may lead to memory biases or, with sensitive activities, to motivational distortions (Weinhardt, Forsyth, Carey, Jaworski, & Durant, 1998). Specifying a time frame may reduce memory biases but may run the risk of grossly reducing variance if the time frame is too narrow for a certain sexual activity to be performed. Given the notoriously skewed distributions of self-report measures of sexual activities (Weinhardt et al., 1998), we opted for the past 6 months both as a period that respondents can survey and as a period in which adolescents may have exposed themselves to sexually explicit material online. As to the range of response categories, we chose *every day* as the maximum end of the response scale not to bias respondents. In questions on the frequency of activities, respondents tend to adjust their answers to what the response categories suggest as usual behavior (Schwarz, Hippler, Deutsch, & Strack, 1985).

Validity and reliability. To test the concurrent and construct validity of our measure of exposure to online sexually explicit material, we correlated it with a theoretically appropriate and a theoretically inappropriate criterion. The correlation with the appropriate criterion of adolescents' exposure to offline porn movies was $r = .63, p < .001$, demonstrating satisfactory concurrent validity. The correlation with the inappropriate criterion of television viewing frequency was $r = .01, ns$, suggesting satisfactory construct validity. The internal consistency of the scale for exposure to sexually explicit material online was very good ($\alpha = .92$).

Validating the responses. Research among both adolescents and adults suggests that exposure to sexually explicit material is socially undesirable (Cameron et al., 2005; Lo & Wei, 2002). As a consequence, our measure of exposure to sexually explicit material online may be endangered by response bias, which describes respondents' tendency to not report (sexual) activities when, in fact, they performed them (e.g., Catania, Gibson, Chitwood, & Coates, 1990; Mustanski, 2001). To be able to tentatively assess the quality of our results, it may therefore be helpful to compare respondents' self-reported exposure to sexually explicit material with the percentage of peers who the respondents perceive to expose themselves to sexually explicit material on the Internet. If across the entire sample the average perceived exposure to sexually explicit material on the Internet considerably exceeds the average self-reported exposure, we may have a tentative indication of response bias.

To measure the average proportion of adolescents perceived by the respondents to expose themselves to sexually explicit material on the Internet, we first asked: "This is certainly difficult to estimate exactly, but you may have a rough notion of the percent-

age of the boys and girls your age that use the Internet for sexual activities. What percentage of boys your age looks for sexual pictures on the Internet?" We asked the same question for the percentage of boys looking for sexual movies on the Internet, for the percentage of girls looking for sexual pictures on the Internet, and for the percentage of girls looking for sexual movies on the Internet. Each respondent was thus supposed to make four guesses. Respondents could also choose a *don't know* option if they felt overwhelmed by the question. Subsequently, the percentages of each of the four perceptual categories were averaged to receive the average perceived proportion of boys (or girls) looking for sexual pictures (or sexual movies) on the Internet.

Measures: Demographics

Age and gender. The measurement of age ($M = 15.5$, $SD = 1.69$) and gender was straightforward. Boys were coded with 0 (48%), girls with 1 (52%).

Ethnicity. As with other Netherlands-based research (Vanwesenbeeck, 2001), we operationalized respondents' race and ethnicity as a dichotomy where 0 meant non-Dutch and 1 meant Dutch. Non-Dutch composed 8.1% of the sample, and 91.9% were Dutch.

Measures: Developmental Characteristics

Pubertal status. Pubertal status was operationalized with the Pubertal Status Scale developed by Petersen, Crockett, Richards, and Boxer (1988). The scale contains five items for boys—body hair, voice change, skin change, growth spurt, and facial hair—and five for girls—body hair, breast change, skin change, growth spurt, and menarche. We removed the skin change item because, in our view, skin change does not have to accompany pubertal changes. Adolescents could indicate on a 4-point scale ranging from 1 (*has not started yet*) to 4 (*has already finished*) whether each bodily change had already begun or had already finished. For validity reasons, we did not provide girls with the response category *has already finished* for the menarche item. The internal consistency of the scale was .89 for male adolescents ($M = 2.91$, $SD = .83$) and .82 for female adolescents ($M = 3.19$, $SD = .56$).

Sexual experience. We operationalized sexual experience with three items: mutual masturbation, oral sex, and coital sex. Pretests revealed that adolescents had no problems understanding the terms. Respondents were asked whether they had performed one or more of the three behaviors. Experience with a particular sexual behavior was coded with 1, lacking experience with a particular behavior was coded with 0. To avoid problems with the log transformation of the resulting scale, we recoded experience with a particular behavior to 2 and lacking experience to 1. The three items loaded on one factor in a factor analysis (explained variance of 81%) and were averaged to form a scale. The resulting alpha was .88 ($M = 1.30$, $SD = .41$).

Measures: Social Context Variables

Parental control. Parental control was operationalized with the item, “My parents know when I am surfing the Internet” ($M = 3.85$, $SD = .99$). The anchors of the response scale were 1 (*does not apply at all*) to 5 (*applies completely*).

Religiosity. Whether adolescents are religious was measured with the item, “I am religious”. Response categories ranged from 1 (*does not apply at all*) to 5 (*applies completely*; $M = 2.23$, $SD = 1.33$).

Age of friends. This measure was tapped with the question, “Is the majority of your friends as old as you are, more than one year older, or more than one year younger than you are?” Response categories were 1 (*younger than I am*), 2 (*as old as I am*), and 3 (*older than I am*) ($M = 2.23$, $SD = .52$).

Relationship status. Adolescents’ relationship status was measured with the question, “Are you currently in a romantic relationship?” Adolescents who were single were coded 0 (67.9%); adolescents who had a relationship were coded 1 (32.1%).

Measures: Personality Characteristics

Sensation seeking. Sensation seeking was operationalized with seven items from the Thrill and Adventure Seeking subscale from Zuckerman’s (1979) Sensation Seeking Scale. The anchors of the response scale were 1 (*does not apply at all*) to 5 (*applies completely*). The items formed a unidimensional scale with a Cronbach’s alpha of .85 ($M = 3.17$, $SD = .84$).

Life satisfaction. We measured life satisfaction with the five-item Satisfaction With Life Scale developed by Diener, Emmons, Larsen, and Griffin (1985). Examples of items of this scale are, “I am satisfied with my life” and “In most ways my life is close to my ideal.” Response categories ranged from 1 (*disagree entirely*) to 5 (*agree entirely*). Cronbach’s alpha for the scale was .90 ($M = 3.53$, $SD = .81$).

Sexual interest. We measured sexual interest with the items, “I am interested in sex” and “I often think about sex”. Response categories ranged from 1 (*disagree entirely*) to 5 (*agree entirely*) ($M = 3.23$, $SD = 1.00$). The items were correlated with $r = .70$, resulting in an alpha of .83.

Measures: Media Use Characteristics

Exposure to sexual content other than on the Internet. This measure was operationalized with adolescents’ frequency of exposure to three R-rated television programs (*Sexcetera*, *Sex Court*, *Latin Lover*), porn movies, and erotic magazines. Response

categories ranged from 1 (*never*) to 5 (*several times a week*). When the five items were entered into a factor analysis, they formed a unidimensional scale. Cronbach's alpha was .84 ($M = 1.32$, $SD = .58$).

Frequency of Internet use. This variable was measured in hours per week on a scale from 0 (*never*) to 7 (*11 hr and more*; $M = 5.38$, $SD = 1.71$).

Speed of Internet connection. We coded adolescents' responses to the question of which type of Internet connection they had such that 0 meant *slow Internet connection* (e.g., telephone connection) and 1 meant *fast Internet connection* (e.g., broadband connection). Those with a fast Internet connection composed 88.7% of the sample, and 11.3% had a slow Internet connection.

Data Analysis

For the analysis of the correlates of adolescents' exposure to sexually explicit material on the Internet, we ran multiple regressions. Multiple regressions assume the variables to have normal distributions, and sexual measures are typically positively skewed (Weinhardt et al., 1998). Prior to the multiple regression analysis, we checked with Shapiro-Wilk tests for normality whether the metric variables were normally distributed. As a result of the test, we had to log transform the measures of parental control, religiosity, age of friends, sensation seeking, life satisfaction, pubertal status, sexual experience, sexual interest, exposure to sexual content, frequency of Internet use, and exposure to sexually explicit material on the Internet. Because some of our measures may be strongly correlated, we also checked whether there was evidence of multicollinearity between the variables. This was not the case. All variance inflation factors were clearly below the critical value of 5.

Results

Occurrence and Frequency of Adolescents' Exposure to Online Sexually Explicit Material

Our first research question focused on the extent to which adolescents expose themselves to sexually explicit material on the Internet. Table 1 shows adolescents' exposure to (a) pictures and (b) movies showing exposed genitals, (c) pictures and (d) movies in which people were having sex, and (e) erotic contact sites. The results are presented separately for male and female adolescents.

Male and female adolescents differed considerably in their exposure to the various types of sexually explicit material on the Internet. Simply put, the majority of male adolescents exposed themselves to sexually explicit material; the majority of female adolescents did not. This did not apply to erotic contact sites, which only a minority of both male and female adolescents used. In the description of Table 1, we therefore do not focus on exposure to erotic contact sites. Among male adolescents, between 53%

Table 1
Frequency of Adolescents' Exposure to
Sexually Explicit Material on the Internet

Frequency	% Male (<i>n</i> = 353)	% Female (<i>n</i> = 376)	% of Total	$\chi^2(5, N = 729)$	<i>p</i>
Pictures of exposed genitals					
Never	35	70	53		
Less than once per month	18	17	18		
1 to 3 times per month	18	7	12		
Once per week	12	3	7		
Several times per week	13	2	8		
Every day	4	0	2		
				124.5	< .001
Movies showing exposed genitals					
Never	47	80	64		
Less than once per month	17	12	14		
1 to 3 times per month	13	5	9		
Once per week	10	2	6		
Several times per week	11	1	6		
Every day	2	0	1		
				106.5	< .001
Pictures of people having sex					
Never	41	77	60		
Less than once per month	18	12	15		
1 to 3 times per month	16	6	11		
Once per week	14	3	8		
Several times per week	9	1	5		
Every day	2	0	1		
				113.2	< .001
Movies of people having sex					
Never	47	78	63		
Less than once per month	14	13	13		
1 to 3 times per month	15	6	10		
Once per week	13	1	7		
Several times per week	9	2	5		
Every day	2	0	1		
				101.2	< .001
Erotic contact sites					
Never	72	88	80		
Less than once per month	11	7	9		
1 to 3 times per month	5	4	5		
Once per week	5	0	3		
Several times per week	5	1	3		
Every day	1	0	0		
				42.6	< .001

(movies depicting sex) and 65% (pictures of exposed genitals) exposed themselves to sexually explicit material on the Internet in the 6 months prior to the interview. In that period, between 20% (movies showing exposed genitals) and 30% (pictures of

exposed genitals) of the female adolescents looked at sexually explicit material on the Internet.

Between 29% (movies of people having sex) and 36% (pictures of exposed genitals) of the male adolescents exposed themselves 1 to 3 times per month or less than once a month to the various types of online sexually explicit material (see Table 1, response categories *less than once a month* and *1 to 3 times a week* added together). The figures for female adolescents ranged between 17% (movies showing clearly exposed genitals) and 24% (pictures of clearly exposed genitals). Between 23% (movies showing exposed genitals) and 29% (pictures of exposed genitals) of the male adolescents looked at the various types of sexually explicit material once a week or more frequently (Table 1, three highest response categories added together). Among female adolescents, the corresponding figures were 5% or lower.

It may be that adolescents exposed themselves to only one of the aforementioned five types of sexually explicit material, which may be somewhat disguised by the figures just presented. Therefore, we also analyzed the index of the five types of sexually explicit material online. (We do not show the results of this analysis in a table, because the index has too many values and thus does not lend itself to presentation in a table.) Because we averaged the five items constituting our index, the index has values from 1 to 6. An index value of 1 means that a given adolescent never exposed himself or herself to any of the five types of sexually explicit material in the 6 months prior to the interview. An index value of greater than 1 indicates that a particular adolescent exposed himself or herself to at least one of the five types of sexually explicit material with a minimum frequency of less than once a month during the 6 months before the interview was held.

Seventy-one percent of male adolescents and 40% of female adolescents had an index value of greater than 1. Put differently, 71% of the male adolescents and 40% of the female adolescents had exposed themselves at least to one of the five types of sexually explicit material in the 6 months prior to the interview with a minimum average frequency of less than once in a month. Furthermore, the *never* response categories in the *total* column in Table 1 suggest that a majority of all adolescents never exposed themselves to the various types of sexually explicit material online. However, an analysis of the index scores reveals a slightly different picture. Fifty-five percent of all adolescents had an index value of greater than 1. Put differently, in the 6 months prior to the interview, 55% of all adolescents were exposed at least to one of the five types with an average frequency of less than once a month.

Validating the responses. As in all sex research, there is no gold standard against which the aforementioned figures could be validated. To get an initial indication of the quality of our figures, we compared respondents' self-reported exposure to sexually explicit material on the Internet with the average percentage of their male and female peers who the respondents perceived to expose themselves to sexually explicit material online. Table 2 shows the average proportion of male and female peers perceived to expose themselves to sexual pictures or sexual movies, separated for male and female respondents, along with the self-reported exposure figures. To calculate the

Table 2
Adolescents' Self-Reported and Average Perceived Exposure
to Sexually Explicit Material on the Internet

	Male Respondents ($n_{\min} = 217$)		Female Respondents ($n_{\min} = 203$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Perceived % male peers exposed to sexual pictures	64.4 _a	22.7	62.9 _b	20.7
Self-reported % male adolescents exposed to sexual pictures			68.3 _{a, b}	
Perceived % female peers exposed to sexual pictures	27.2 _a	18.6	28.4 _b	17.6
Self-reported % female adolescents exposed to sexual pictures			32.4 _{a, b}	
Perceived % male peers exposed to sexual movies	48.9 _{a, b}	26.4	54.3 _a	24.9
Self-reported % male adolescents exposed to sexual movies			56.7 _b	
Perceived % female peers exposed to sexual movies	18.2 _a	16.3	19.8 _b	16.6
Self-reported % female adolescents exposed to sexual movies		26.3 _{a, b}		

Note: Within each of the four categories (e.g., male peers and male adolescents exposed to sexual pictures), the subscripts refer (a) to differences in the average perceived exposure to the given category between male and female respondents (independent *t* test) and (b) to differences between the perceived exposure and the self-reported exposure (one-sample *t* test). Cells with the same subscript differ at least at $p < .01$.

Reading example: The figures in row 1 mean that on average, male respondents perceived that 64.4% of their male peers exposed themselves to sexual pictures on the Internet. Female respondents on average perceived that 62.9% of their male peers exposed themselves to sexual pictures on the Internet. The proportion of male adolescents who reported exposing themselves to sexual pictures on the Internet was 68.3% (see row 2).

figures for self-reported exposure to sexually explicit material in pictures and in movies, the two picture and the two movie categories from Table 1 were combined into one picture and one movie category each.

In three of four cases, male and female adolescents held, on average, similar perceptions of the percentage of their peers exposing themselves to sexually explicit material online. However, female adolescents (54.3%) tended to perceive a greater proportion of boys to expose themselves to sexual movies than male adolescents did (48.9%). More important, the average perceived exposure to sexually explicit material exactly mirrored the ranking of how frequently the various types of sexually explicit material were consumed according to respondents' self-reports: Our respondents correctly perceived that their peers exposed themselves more often to sexual pictures on the Internet than to sexual movies. They were also right in the perception that their male peers consume the various types of sexually explicit material more frequently than their female peers do. Moreover, there were no gross distortions in adolescents' perceptions of which proportion of their peers exposed themselves to sexually explicit material online.

To test whether the perceived average proportion deviated significantly from the self-reported one, we ran one-sample *t* tests. The proportion of adolescents who re-

ported exposure to either sexually explicit pictures or movies in the 6 months prior to the interview constituted the test value. As can be seen in Table 2, both female and male adolescents slightly underestimated the proportion of their male and female peers who expose themselves to sexually explicit material in either pictures or movies. There was one exception: On average, female adolescents correctly perceived the proportion of their male counterparts that exposed themselves to sexual movies on the Internet.

Correlates of Adolescents' Exposure to Sexually Explicit Material on the Internet

The second objective of this research was to study the correlates of adolescents' exposure to sexually explicit material on the Internet. The main effect model in Table 3 addresses the various hypotheses regarding the potential associations between demographics, developmental characteristics, social context variables, personality characteristics, and media use characteristics and adolescents' exposure to sexually explicit material on the Internet. The interaction effect model in Table 3 addresses Research Question 3 and focuses on potential gender differences in the correlates of online sexually explicit material.

Demographics. Adolescents' gender significantly affected exposure to sexually explicit material online. Male adolescents were clearly more likely to expose themselves to sexually explicit material on the Internet than were female adolescents. This difference was already visible in Table 1, but it also held when controlling for other potential correlates. Adolescents' age and their race and ethnicity were unrelated to exposure to sexually explicit material. In sum, Hypothesis 1a was supported and Hypothesis 1b was not supported. In response to Research Question 2, we found no difference between Dutch and non-Dutch adolescents in their exposure to online sexually explicit material.

Developmental characteristics. We predicted that adolescents whose pubertal status was more advanced would expose themselves to sexually explicit material more often than adolescents whose pubertal status was less advanced. We also expected that sexual experience would boost exposure to sexually explicit material online. There was no empirical evidence of the two relationships. Hypotheses 2a and 2b were not supported.

Social context variables. In contrast to our expectations, neither parental control, nor adolescents' religiosity, and relationship status was associated with exposure to sexually explicit material online. As expected, adolescents exposed themselves more frequently to sexually explicit material on the Internet if the majority of their friends were younger. Hypothesis 3c was thus supported whereas Hypotheses 3a, 3b, and 3d were not supported.

Table 3
Correlates of Adolescents' Exposure to
Sexually Explicit Material on the Internet ($N = 690$)

Characteristic	Main Effect Model			Interaction Effect Model		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Demographic						
Gender (female)	-.215***	.032	-.21	.030	.121	.03
Age	-.004	.012	-.01	.001	.011	.00
Dutch ethnicity	-.047	.050	-.03	.089	.073	.05
Developmental						
Pubertal status (ln)	.100	.063	.06	.143	.073	.08
Sexual experience (ln)	-.009	.063	-.01	.133	.088	.07
Social context						
Parental control (ln)	-.054	.041	-.04	-.044	.040	-.03
Religious (ln)	.021	.023	.03	.027	.022	.03
Age friends (ln)	-.135*	.055	-.07	-.051	.072	-.03
In relationship	.020	.034	.02	-.028	.047	-.03
Personality						
Sensation seeking (ln)	.102*	.048	.06	.189**	.066	.11
Life satisfaction (ln)	-.175***	.050	-.10	-.173***	.049	-.09
Sexual interest (ln)	.269***	.042	.20	.301***	.042	.23
Media use						
Exposure to other sexual content (ln)	.700***	.048	.46	.670***	.047	.44
Fast Internet	.099*	.044	.06	.177**	.067	.11
Frequency Internet use at home (ln)	.061	.037	.05	.116*	.055	.09
Interaction effects						
Dutch \times Gender				-.225*	.098	-.22
Pubertal Status \times Gender				-.309**	.110	-.10
Sexual Experience \times Gender				-.302**	.116	-.13
Age Friends \times Gender				-.155	.109	-.05
In Relationship \times Gender				.138*	.067	.11
Sensation Seeking \times Gender				-.167	.091	-.07
Fast Internet \times Gender				-.081	.087	-.07
Frequency Internet Use \times Gender				-.126	.074	-.07
Constant	.481			.125		
R^2	.540			.570		
Adjusted R^2	.530			.550		

Note: Continuous variables involved in interaction terms were centered around their mean. ln = log transformed.

* $p < .05$. ** $p \leq .01$. *** $p < .001$ (two-tailed).

Personality characteristics. Table 3 shows that all personality characteristics were related to exposure to sexually explicit material online. Adolescents with a high need for sensation exposed themselves to sexually explicit material more often than adolescents with a low need for sensation. As expected, adolescents who were dissatisfied

with their lives consumed sexually explicit material more often than adolescents who were satisfied with their lives. Finally, sexual interest boosted adolescents' exposure to sexually explicit material on the Internet. Hypotheses 4a, 4b, and 4c were supported.

Media use characteristics. As expected, exposure to sexual content in media other than the Internet was strongly related to exposure to sexually explicit material online. This relationship was the strongest of all relationships found. Adolescents with a faster Internet connection were more likely to expose themselves to sexually explicit material on the Internet than adolescents with a slower Internet connection. The frequency of Internet use was unrelated to exposure to sexually explicit material. In sum, Hypotheses 5a and 5b were supported; Hypothesis 5c was not.

Gender Differences

Research Question 3 focused on gender differences in the correlates of exposure to sexually explicit material online. To find the correlates that may be different for male and female adolescents, we first estimated the main effect model from Table 3 separately for male and female adolescents (results not shown). For age, parental consent, religiosity, life satisfaction, sexual interest, and exposure to sex in other media, the regression coefficients in the male and female subsamples differed neither in size nor in direction. However, as to the remaining correlates, there was either a difference in the size or in the sign between the regression coefficients in the two subsamples. To test whether the correlates of exposure to sexually explicit material differed significantly for male and female adolescents, we created interaction terms and included them in the regression model. Continuous variables were centered to avoid multicollinearity problems (Aiken & West, 1991).

The interaction model in Table 3 shows that overall, four of the eight interaction effects were significant. The interaction effects added 3% of explained variance to the model. We post hoc probed the conditional effects within the significant interaction effects in the interaction model for significant difference from zero (Aiken & West, 1991). The goal of this procedure is comparable to the purpose of post hoc tests in analyses of variance and presents a rigorous test of interaction effects. In this study, it specifically meant that we analyzed whether the conditional effects for male and female adolescents, which result from interaction effects of the various variables with gender, differed significantly from zero.

For the significant interaction terms involving a continuous variable (i.e., the interaction between sexual experience and gender and between pubertal status and gender), post hoc probing requires the manual calculation of standard errors. This has to be done separately for the effect for male and female adolescents (for details, see Aiken & West, 1991). Dividing the conditional slope through the pertinent standard error gives the *t* value of a conditional effect. As to the interaction terms with two dummy variables (Dutch Ethnicity \times Gender and In Relationship \times Gender), we created three dummy variables representing three of the four possible groups and included

them, instead of the original interaction term, in the regression model (e.g., for the interaction Dutch Ethnicity \times Gender, we chose non-Dutch boys as the reference group and created one dummy variable each for Dutch girls, Dutch boys, and non-Dutch girls).

The post hoc probing revealed that the overall significant interaction between Dutch ethnicity and gender did not hold when the conditional effects were analyzed separately. Even for the group of Dutch female adolescents who, according to the results of the interaction effect model in Table 3, would be expected to display the strongest conditional effect, there was no significant effect ($B = -.106$, $SE B = .110$, $p < .34$). The same was true for the interaction effect between relationship status and gender. According to the results of the interaction effect model in Table 3, female adolescents in a relationship would be expected to be most likely to consume sexually explicit material on the Internet. However, as for all other groups, this conditional effect was not significant ($B = .141$, $SE B = .125$, $p < .27$).

A more advanced pubertal status increased male adolescents' exposure to online sexually explicit material ($B = .143$, $SE B = .072$, $p < .05$) but was unrelated to female adolescents' exposure to such material ($B = -.166$, $SE B = .097$, $p < .09$). Regarding the interaction between sexual experience and gender, the post hoc probing showed that among male adolescents, sexual experience was not related significantly to exposure to sexually explicit material online ($B = .133$, $SE B = .084$, $p < .12$). However, the more sexual experiences female adolescents had, the less frequently they were exposed to online sexually explicit material ($B = -.169$, $SE B = .086$, $p < .05$).

Discussion

Despite widespread public concern about adolescents' exposure to sexually explicit material on the Internet, reliable and valid data have been scarce. Based on a survey of Dutch adolescents, the investigation provides evidence that a considerable proportion of especially male adolescents expose themselves to sexually explicit material on the Internet. Generally speaking, the majority of male adolescents expose themselves to sexually explicit material online, and the majority of female adolescents do not. There are not only differences in whether male and female adolescents consume online sexually explicit material, but there are also differences in how frequently they do so. Whereas about one fourth of male adolescents expose themselves to various types of online sexually explicit material at least once a week, this category encompasses at maximum a group of 5% of female adolescents.

Answers to sex-related questions are subject to multiple biases and cannot be validated against an objective external criterion. Therefore, we compared the responses of our interviewees with the average proportion of their male and female peers whom they perceived to consume sexually explicit material. The results tentatively suggest that the responses we received may not overly suffer from a reporting bias and may be relatively valid. The figures of self-reported and perceived exposure by male and

female peers indicated that adolescents tended to slightly underestimate the exposure to sexually explicit material among their peers. One potential reason for this could be that exposure to online sexually explicit material is a predominantly solitary activity about which adolescents do not speak very often with others or at least not in detail. As a result, it may be difficult to come to a precise perception of which proportion of peers expose themselves to online sexually explicit material.

Correlates of Adolescents' Exposure to Sexually Explicit Material on the Internet

On the basis of Steele and Brown's (Brown, 2000; Steele, 1999; Steele & Brown, 1995) media practice model and research from various social scientific disciplines, we investigated five groups of potential correlates of adolescents' exposure to online sexually explicit material: demographics, developmental characteristics, social context variables, personality characteristics, and media use characteristics. Concepts from each of these five groups turned out to be significant correlates of adolescents' exposure to sexually explicit material, with the group of personality characteristics representing the most consistent group of correlates.

Demographics. In line with predictions from Steele and Brown's (Brown, 2000; Steele, 1999; Steele & Brown, 1995) media practice model and with results from previous research (Cameron et al., 2005; Goodson et al., 2001; Lo & Wei, 2005; Stack et al., 2004; Ybarra & Mitchell, 2005), we found that adolescents' exposure to sexually explicit material on the Internet is gendered. Gender influenced adolescents' exposure to such material directly but also moderated the relationship between both pubertal status and sexual experience and exposure to online sexually explicit material. Given the key role of gender for our understanding of the implications of exposure to online sexually explicit material, one of the crucial tasks of future research will be to identify the concepts that distinguish male and female sexual socialization.

Respondents' age was not associated with their exposure to sexually explicit material online. Statistically, the absence of this effect may result from the strong correlation of age with pubertal status ($r = .67, p < .001$) and sexual experience ($r = .50, p < .001$), two developmental characteristics that did affect exposure to online sexually explicit material, albeit moderated by gender. Conceptually, the absence of a significant age effect suggests that age may only partly capture the developmental differences that characterize adolescents. Therefore, future research should try to replace age with theoretically more meaningful developmental variables, for example, by further developing the line of inquiry started in recent research (Brown et al., 2005) and continued in this study with its focus on adolescents' pubertal status and sexual experience.

Adolescents' ethnicity was unrelated to exposure to online sexually explicit material. However, researchers should not prematurely eliminate this variable from studies on adolescents' exposure to online sexually explicit material. Ethnicity is an important

proxy for adolescents' sociocultural backgrounds. In countries where ethnic differences are more distinct than in the Netherlands, this variable may turn out to be indispensable for a more profound understanding of the relationship between adolescent sexuality and media use.

Developmental characteristics. Moderated by adolescents' gender, both pubertal status and sexual experience were associated with exposure to sexually explicit material on the Internet. Among male adolescents, a more advanced pubertal status increased exposure to sexually explicit material whereas the pubertal status of female adolescents was unrelated to their consumption of such material. The more sexually experienced female adolescents were, the less often they exposed themselves to sexually explicit material on the Internet. Among male adolescents, no relationship between sexual experience and exposure to online sexually explicit material emerged. The interaction of these developmental characteristics with gender attests to the fact that adolescents' physiosexual development and their sociosexual background jointly affect exposure to online sexually explicit material. If we want to better grasp the implications of adolescents' exposure to sexually explicit material, we should not only rely on biological approaches but put them into a sociosexual perspective.

In this context, a methodological remark regarding the interaction effect of pubertal status and gender seems in order. As outlined in the results section, the negative influence of a more advanced pubertal status among female adolescents on exposure to sexually explicit material did not reach conventional levels of significance. Partly, the absence of this effect may be because of lacking variance. As can be seen in the Method section and in the standard deviations, the variance of the pubertal status scale was greater for male adolescents ($s^2 = .69$) than for female adolescents ($s^2 = .31$). A great proportion of female adolescents were already very advanced in their pubertal development, which reduced the systematic variance of the pubertal status variable. Therefore, future research should also include adolescents younger than 13 years of age to increase the variance of the pubertal status variable for female adolescents.

Social context variables. In contrast to predictions based on the media practice model, the majority of the variables that define an adolescent's social context—parental control, relationship status, and religiosity—were not associated with exposure to sexually explicit material online. These null findings regarding parental control and relationship status are to some extent in line with related research. There is tentative evidence that adolescents know how to circumvent parental control efforts (Cameron et al., 2005). Research also suggests that a romantic relationship as such does not keep people from consuming sexually explicit material. It largely depends on people's satisfaction with the relationship whether they abstain from such material (Stack et al., 2004). The lacking influence of religiosity on exposure to online sexually explicit material may partly result from the weak role of religion in the Netherlands. Dutch society has become a secular society in which the influence of religious communities has decreased strongly, in particular among adolescents.

However, our results should not be interpreted in the sense that the social context does not affect adolescents' exposure to online sexually explicit material. This conclusion is supported by our finding that adolescents with predominantly younger friends consume sexually explicit material online more often than adolescents with older friends. Our result not only complements Collins et al.'s (2004) study that found the same for exposure to sexual content on television; in line with the media practice model, it also points to the importance of adolescents' peer group as influence on their consumption of sexually explicit material on the Internet. Peers play an important role for adolescents' access to sexual media content, for example, in peer-to-peer file-sharing networks (Greenfield, 2004), and are also influential in the promotion of undesirable media content (Nathanson, 2001). Therefore, the underlying social mechanisms of adolescents' exposure to online sexually explicit material can probably be best understood when investigating the characteristics of adolescents' peer groups more thoroughly.

Personality characteristics. The positive relationship between sensation seeking and exposure to sexually explicit material was largely in line with earlier research (Collins et al., 2004; Vanwesenbeeck, 2001). As is true for other forbidden behavior, sensation seeking boosts adolescents' tendency to engage in such behavior. Sexual interest was a strong correlate of whether adolescents exposed themselves to sexually explicit material on the Internet. The finding supports Collins et al.'s (2004) presumption that sexual interest may be an important concept and should be refined to be included as a standard variable in future research. More generally, the strong association between sexual interest and exposure to sexually explicit material points to another potentially crucial concept: involvement. We have conceptualized sexual interest as adolescents' cognitive involvement with sexual matters. However, there may be several other dimensions of involvement (e.g., attention to sexually explicit material or emotional involvement) that might be equally strongly related to online sexually explicit material. Ward and Rivadeneyra (1999) have explicated the importance of viewers' involvement with sexual TV content for the formation of sexual attitudes. It seems that a stronger focus on adolescents' involvement with online sexually explicit material may greatly advance our understanding of the ramifications of adolescents' exposure to sexually explicit material.

In line with related research (Ybarra & Mitchell, 2005; Wolak et al., 2003), our study has documented that adolescents who are less satisfied with their lives also consumed sexually explicit material on the Internet more often. This worrying relationship is one of the most relevant to be investigated in future research, not least because it dovetails with research that has pointed out the vicious circle of problematic Internet use and decreasing life satisfaction (e.g., Caplan, 2003; Engelberg & Sjöberg, 2004; Prezza, Pacilli, & Dinelli, 2004). Longitudinal designs should disentangle whether adolescents who are dissatisfied with their lives turn to sexually explicit material or whether exposure to sexually explicit material leads them to be dissatisfied with their lives. Clarification of this problem could be a major contribution to and extension of our knowledge about the consequences of Internet use on adolescents' well-being.

Media use characteristics. The strongest correlate of exposure to sexually explicit material online was exposure to sexual material in media other than the Internet. This result not only confirms that youth do expose themselves to various products of all-pervasive sexualized media, but it also shows that adolescents receive sexual messages through multiple media. If we want to grasp the meaning of mediated sexuality on adolescents' sexual attitudes and behavior, we need to take into account the multiplicity of sexual media.

Our data further suggest that there may be a mutually reinforcing cycle of exposure to sexually explicit material online, exposure to sexual material in media other than the Internet, and sexual interest. Future research needs to study the antecedents, dynamics, and consequences of this cycle, potentially with the media practice model as a theoretical framework (Brown, 2000; Steele, 1999; Steele & Brown, 1995). Preferably, such research is conducted from a cross-national comparative perspective to test how relationships established in a particular cultural context behave in another cultural context. On the basis of this study, we can only emphasize that Dutch youth are confronted with and expose themselves to an unprecedented amount of R-rated and X-rated material in the media. Research on its consequences for adolescents' sexual socialization is largely missing but, as this study has shown, is urgently needed.

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Jochen Peter (Ph.D., University of Amsterdam, the Netherlands) is an assistant professor in the Amsterdam School of Communications Research at the University of Amsterdam. His research interests focus on the social consequences of the Internet and on political communication.

Patti M. Valkenburg (Ph.D., Leiden University, the Netherlands) is a professor in the Amsterdam School of Communications Research at the University of Amsterdam. Her research interests include children's likes and dislikes in entertainment and the effects of media on the cognitive, affective, and social development of children and adolescents.