

Exposure to Internet Pornography and Taiwanese Adolescents' Sexual Attitudes and Behavior

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This study examines use of Internet pornography by adolescents in Taiwan and the relationships between exposure to Internet pornography and the sexual attitudes and behavior of surveyed teens. Results show that about 38% of the sample had some exposure to Internet pornography. Further, this exposure was associated with greater acceptance of sexual permissiveness and the greater likelihood of engaging in sexually permissive behavior. Most important, this exposure showed sustained relationships with sexually permissive attitudes and behavior when it was examined simultaneously with exposure to traditional pornography, general media use, and demographics.

Soon after its commercialization in 1993, the Internet and the World Wide Web gained prominence in producing, disseminating, storing, and presenting pornographic materials known as cyberporn or cybersex. Content analyses (Heider & Harp, 2000; Mehta & Plaza, 1997; Rimm, 1985) have shown that pornographic materials posted and distributed on the Internet have been presented in an unprecedented and interactive dimension. Concerns over the excessive growth of Internet pornography have given rise to a moral panic (McMurdo, 1997). Evidence in the literature has established an association of exposure to pornographic materials with sexual arousal and cognitive effects, especially changes in attitudes (such as disinhibition) and values (such as sexual callousness). The conclusions of the impact on behavioral effect, however, are inconsistent. A large number of studies reported effects of use of pornography on aggression, but other studies (e.g., Donnerstein, Linz, & Penrod, 1987; Linz, Donnerstein, & Adams, 1989) have suggested that aggression accompanied materials containing sexual violence. Several meta-analytic analyses provided the most compelling evidence (Allen, D'Alessio, & Brezgel, 1995; Allen, Emmers, Gebhardt, & Giery, 1995) to support the proposition that consumption of either nonviolent or violent pornography may lead to some serious attitudinal and behavioral effects. Not sur-

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prisingly, policymakers, parents, and educators fear cyberporn will cause greater social harm than traditional pornography.

Much of the moral panic over Internet pornography has been attributed to the capability of this newly emerged mass medium to provide widespread and unguarded access via bulletin board services, e-mail (especially listserv), Internet relay chat, and real-time data feeds. The presentation of pornographic materials in multimedia format, including digitized moving images, animated sequences, hot chats, and interactive sexual games, is another unique feature of cyberporn that differs from traditional hard-core pornographic materials.

The growing research on effects of Internet pornography has primarily focused on adult users (Barak & Fisher, 1997; Barak, Fisher, Belfry, & Lashambe, 1999; Lo & Wei, 2002; Wu & Koo, 2001). The influence of Internet pornography on the Web-savvy adolescents, however, has constituted a gap in the current research. The need for research in this area is particularly strong (Donnerstein & Smith, 2001). This study responds to the need by investigating how adolescents use Internet pornography and what the correlates (e.g., demographics, general media use, sexual attitudes, and behavior) of exposure to Internet porn are.

In the United States, the media were ranked second only to school sex education programs as a source of information about sex (Greenberg, Brown, & Buerkel-Rothfuss, 1993). A *Time/CNN* poll (Stodghill, 1998) singled out TV as the principal source of information about sex: 29% of surveyed US teens mentioned it. Adolescents are skilled Internet navigators. Another *Time/CNN* poll of teenagers found 82% had used the Internet; among them, 44% had seen X-rated content (Okrent, 1999). A more recent survey of 2,628 Taiwanese high school and college students found that 88% had navigated the Internet and 44% had surfed pornographic Web sites (Lo & Wei, 2002). The Internet thus offers an often-unguarded access to an abundance of saliently presented sexual materials and enables adolescents to view materials that previously were kept off limits. As Donnerstein and Smith (2001) argued, Internet pornography may act as an even more influential socializing agent of sexuality to teen Internet users than traditional media.

This study focuses on exposure to Internet pornography and the relationships between the exposure and sexual attitudes, beliefs, and behavior. In so doing, it aims to expand the scope of literature on sex and the media, thus contributing to the theorization of effects of cyberporn use in the era of Internet communication.

Literature Review and Hypotheses

Effects of Internet Pornography on Sexual Attitudes and Behavior

Despite the widespread public concern about the possible effects of Internet pornography on adolescents' sexual attitudes and behavior, there is a paucity of empiri-

cal data. A review of the literature found only a limited number of studies examining the influence of Internet pornography on adults (Barak & Fisher, 1997; Barak et al., 1999; Kalyanaraman, Sundar, & Oliver, 2000). Empirical research on cyberporn's impact on adolescents is even scantier. The literature on effects of media sex and pornographic materials on adolescents basically comprises a large number of studies of sexual material and pornography carried in traditional media, particularly television (Brown, Steele, & Walsh-Childers, 2001; Greenberg & Hofschild, 2001; Malamuth & Impett, 2001; S. L. Smith & Donnerstein, 1998). This research tradition has largely focused on testing the effects of pornography on poorly informed children's psychological dispositions in terms of sexually permissive attitudes and behavior. Our review of past empirical findings, therefore, relies on those about traditional media.

Past findings consistently show that exposure to sexually explicit content is a strong influence of young people's sexually permissive attitudes. Specifically, Strouse and Buerkel-Rothfuss (1987) found that consumption of sexually suggestive media was a significant predictor of sexually permissive attitudes and behavior for college students. In addition, those who had a higher level of exposure to sexually suggestive media tended to have sexual relations with more than one person. A study by Greeson and Williams (1986) also found that viewing sexually suggestive content on MTV was linked to acceptance of premarital sex among junior and senior high school students. Similarly, Bryant and Rockwell (1986) found that adolescents exposed to television shows with premarital sexual relations evaluated these relations as less bad than did those exposed to shows with marital sexual relations. The finding was confirmed in more studies on viewing R-rated films (Brown & Newcomer, 1991).

Other studies employing either a survey or experimental methodology were conducted to explore the effects of exposure to pornography on people's attitudes toward women, sexual aggression, and sexual crimes (Allen, Emmers, et al., 1995; Bauserman, 1996; Donnerstein et al., 1987; Zillmann & Bryant, 1989). Although correlational research does not consistently support a link between pornography exposure and attitudes toward women and sexual aggression (Allen, Emmers, et al., 1995; Bauserman, 1996; Malamuth, Addison, & Koss, 2000), a survey of 1,585 Taiwanese high school students found that exposure to pornographic media was a significant predictor of sexually permissive attitudes (Lo, Neilan, Sun, & Chiang, 1999). Moreover, experimental research indicates that exposure to pornography may lead to insensitivity toward victims of sexual violence (Zillmann & Weaver, 1989) and contribute to men's aggressive behavior against women (Donnerstein et al., 1987; Malamuth et al., 2000; Zillmann, 1998; Zillmann & Bryant, 1989). With a focus on assessing the influence of exposure to pornography on people's sexually permissive attitudes and behavior, Zillmann and Bryant's (1988) experimental study found that college students who watched 6 hours of X-rated films over 6 weeks tended to show greater acceptance of premarital sex and tended to see sex without love as being more important than did a control group that saw non-sexually explicit films. Based on these consistent findings, we predict the following:

H₁: Adolescents who have had a higher level of exposure to Internet pornography will exhibit a higher level of premarital permissive attitudes.

Previous research also examined the impact of exposure to sexual content on people's attitudes toward extramarital sex. Extramarital sex refers to sexual activity between a married person and someone other than his or her current spouse (Goetsch, 1994). In most of the Western as well as Chinese societies, extramarital sex is viewed as sinful, criminal, or immoral (Masters, Johnson, & Kolodny, 1988). Not surprisingly, most people disapprove of extramarital sex. For example, in a survey conducted in the United States, more than 90% of the general public felt that extramarital sex was "always" or "almost always" wrong (T. W. Smith, 1994).

Past findings reveal that extramarital sex is linked to demographic factors, personal values, opportunities for extramarital sex, marital satisfaction, and premarital sexual permissiveness (Maykovich, 1976; Reiss, Anderson, & Sponaugle, 1980; T. W. Smith, 1994). One study (Zillmann & Bryant, 1988) specifically examined the effects of exposure to traditional pornography on attitudes toward extramarital sex. Prolonged exposure to X-rated films was found to be associated with greater acceptance of extramarital sex and greater tolerance for violations of sexual exclusivity. Accordingly, we further propose that there will be a relationship between exposure to Internet pornography and attitudes toward extramarital sex. Therefore, it was hypothesized that

H₂: Adolescents who have had a higher level of exposure to Internet pornography will be more likely to condone extramarital sex.

The influence of exposure to sexually explicit materials on teens' sexual behaviors focused on their sexual permissiveness. Evidence was solid. In a survey study of 1,000 adolescents' self-reported beliefs about their own sexuality, Howard (1985) found television and pop music were the two biggest sources of media pressure to engage in sexual activity. Courtright and Baran (1980) also found that heavy television viewers tended to hold more negative attitudes toward maintaining virginity. Another study by Brown and Newcomer (1991), which examined the linkage between television viewing and adolescents' sexual experience, found that teenagers' viewing of sex-oriented television programs was positively correlated with their sexual activities. Peterson, Moore, and Furstenberg (1991) found that viewing television was positively correlated with sexual activity of teenage girls. Furthermore, research conducted in Taiwan found that exposure to pornography on electronic media was the most powerful predictor of adolescents' sexually permissive behavior (Lo et al., 1999). The aforementioned empirical findings provide the rationale for the third hypothesis:

H₃: Those adolescents who have had a higher level of exposure to Internet pornography will exhibit a higher level of sexually permissive behavior.

Although sexually explicit materials and pornographic content on the Internet may not differ from those appearing in traditional media, the state-of-the art presentation and dissemination capabilities of the new medium make it unique and novel. In fact, the dis-

tinctive features of the Internet, such as easy access, anonymity, and affordability for users across age groups and geographic boundaries, and the opportunities for users to customize materials for downloading and storage, make it an ideal medium for production, distribution, and manipulation of pornographic materials (Kalyanaraman et al., 2000). In addition, Internet pornographic materials in digital interactive formats allow for real-time, ongoing interactions with the target audience, another major difference from traditional channels in presenting stimulants for sexual arousal. Therefore, it is unsurprising that the Internet has become an important channel for sexual communication.

Theoretically, the unique aspects of Internet pornography could intensify the socially undesirable effects of pornographic materials and make adolescents more susceptible to the influence of Internet pornography. As Barak et al. (1999) noted, the interactive nature of the Internet may create a "sense of place" and "potentiate any negative effects of pornography" (p. 68). Empirically, however, results were mixed. In an experimental study, Barak and Fisher (1997) examined the relationship between the use of interactive erotica and antifemale attitudes and behavior. They found that the interactive erotic stimuli resulted in significant amounts of sexual arousal, but use of computer-mediated pornography was not correlated with negative attitudes toward women and related behavior. The Barak et al. (1999) experimental study on short-term effects of exposure to Internet pornography found that exposure to Internet pornography had no effect on men's negative attitudes toward women, rape myth acceptance, or likelihood of sexual harassment. In another experimental study, however, Mahood, Kalyanaraman, and Sundar (2000) found that exposure to high and medium interactivity, as compared with low interactivity,¹ increased the dehumanizing effect of Internet pornography and led to more acceptance of violence toward women. An experimental study by Kalyanaraman et al. (2000) found that accidental exposure to pornographic Web sites resulted in more negative impressions of Internet pornography and negative perceptions of the world and people. In a more recent study, Fisher and Barak (2001) attempted to provide a conceptual and empirical context for considering antecedents and consequences of experience with Internet sexuality. Based on the Sexual Behavior Sequence, they proposed that experience with Internet sexuality would reinforce people's preexisting arousal, affective, and cognitive responses to sexuality.

At any rate, it is reasonable to expect that exposure to the highly interactive and sophisticated forms of Internet pornography may exert a greater influence on adolescents' permissive attitudes and behavior. However, given the lack of consistent empirical findings, only one research question was raised:

RQ: Will exposure to Internet pornography be a stronger correlate of adolescents' sexually permissive attitudes and behavior than will exposure to traditional forms of pornography?

Gender Differences in Internet Pornography Exposure

The existing research suggests that a few variables function as intervening variables in moderating the effects of exposure to various types of media sex and pornographic con-

tent (Donnerstein & Smith, 2001). Gender is one such variable. Past research on traditional forms of pornography indicates that adolescents have a surprisingly high level of exposure to a variety of pornography (Strasburger, 1995), with adolescent boys seeing much more pornographic material than do girls (e.g., Bryant & Brown, 1989). A study (Elias, 1971) of high school students in the United States reported that 89% of the boys and 40% of the girls said they had read *Playboy*. A more recent study (Greenberg & Linsangan, 1993) of 1,200 high school students in Michigan found that of 30 popular, sexually oriented R-rated movies, high school boys reportedly had viewed an average of 15.3 films, and high school girls had viewed an average of 14.5 films.

Research conducted in Taiwan also shows that males saw much more pornographic material than did females. For example, a study of 50,150 high school and college students by the Taiwan Provincial Family Planning Research Institute found 93.5% of the males and 66.9% of the females in the sample had been exposed to pornographic books or magazines (Lin & Lin, 1996). A more recent study (Lo et al., 1999) found that high school boys reported seeing many more pornographic films, magazines, books, and comics than did girls. The same study also found that 38.1% of the high school boys and 7.1% of the girls reported having viewed pornography on a computer or CD-ROM. Based on these research findings on exposure to pornography in traditional media, the fourth research hypothesis was posed:

H₄: Male adolescents will have a higher level of exposure to Internet pornography than will female adolescents.

Method

Sample

Data used for hypothesis testing came from a large-scale survey of middle and high school students in Taiwan. Guided by a multistage cluster sampling plan, respondents were drawn from 20 randomly selected high schools and middle schools from a pool of 67 high schools and 62 middle schools in Taipei, Taiwan. Prior approvals in writing were obtained from principals of the chosen schools and teachers whose classes were drawn.² Three classes were randomly chosen from each school. Given the sensitive nature of the survey, students in the chosen classes were approached by trained seniors of a large national university serving as field supervisors with an assurance that their participation was completely voluntary; those who were willing to participate were assured of anonymity and confidentiality. Then, the self-administered questionnaires, which were pretested prior to the interviews, were distributed in classes during a 2-week period in May 2001. Of the total 2,102 students, 2,001 (95.2%) completed questionnaires for analysis.

Among the 2,001 respondents in the sample, 1,001 (50%) were boys and 1,000 (50%) were girls. Of the sample, 1,195 (59.7%) were high school students and 806

(40.3%) were middle school students. The average age for high school respondents was 16.7 years ($SD = .88$); the average age for middle school respondents was 14.1 years ($SD = .99$). Thus, the sample is representative of the middle and high school populations in Taipei with respect to age and gender.³

Variables and Measurement

Exposure to Internet Pornography. Although the term *pornography* drives its meaning from the Greek term referring to writings about prostitutes (Perse, 2001), a number of definitions of pornography exist in the literature studying numerous forms of explicit and nonexplicit depictions of human sexual activity (Donnerstein et al., 1987). Depending on their purpose of study, some scholars (Dines, Jensen, & Russo, 1998) define pornography as sexual depictions that are intended for the purpose of sexual arousal. Others (Longino, 1998) refer pornography to any depictions of human sexuality that degrade, debase, and dehumanize portrayals of women, not simply if they are sexually arousing. The 1986 U.S. Attorney General's Commission on Pornography identified five categories of pornographic materials: (a) sexually violent materials, (b) nonviolent materials that involved degradation or domination of women, (c) nonviolent and nondegrading materials, (d) nudity, and (e) child pornography (Harris, 1994). The aforementioned content-based definitions emphasized sexually explicit material as a distinguishing characteristic of such material and consequences of using it (Fisher & Barak, 2001).

For the purpose of this study, conducted in Taiwan, which seeks to understand linkages between exposure to traditional pornography as well as Internet pornography and cognitive responses among adolescents, pornography refers broadly to sexually explicit depictions of human subjects distributed in mass media that may stimulate sexual responses in users. Internet pornography refers to sexually explicit material distributed via the Internet that exploits the interactive and multimedia capabilities of the Web. Specifically, respondents were first asked how often they had viewed Internet pornography in the past 1 or 2 years. The response categories were 1 (*never*), 2 (*once or twice per year*), 3 (*once or twice per month*), 4 (*once or twice per week*), and 5 (*nearly every day*). Then, respondents were given a list that named seven types of pornography on the Internet (namely pornographic stories, pornographic pictures, female genitals, male genitals, nude children, nude adolescents, and sexual intercourse), and respondents were asked how often they had seen each of them. The original response categories were 1 (*never*), 2 (*seldom*), 3 (*occasionally*), 4 (*sometimes*), and 5 (*often*). These seven items were recoded by collapsing response categories 2 and 3 into a single *seldom* category (category 2) along with 1 (*never*), 3 (*sometimes*), and 4 (*often*) to form a new 4-point scale. (The original two categories—2 [*seldom*] and 3 [*occasionally*] were rather indistinguishable, which provided the basis for collapsing, and which resulted in better frequency distribution.) Results of principal component factor analysis show that the seven items were grouped in a single

factor, indicating that they measured the same underlying concept. The single factor solution explained 61.24% of the total variance (eigenvalue = 4.29). A composite measure of Internet pornography exposure was created by adding the seven items and dividing the sum by 7 ($M = 1.52$, $SD = .55$, Cronbach's $\alpha = .89$).

Exposure to Pornography in Traditional Media. Following the conceptual definition of pornography as sexually explicit depictions of human subjects distributed in mass media that may stimulate sexual responses in users, a list of seven traditional forms of pornographic materials (R-rated movies, R-rated rental films, R-rated movies on cable, sexually explicit movies on special cable channels, pornographic magazines, pornographic books, and pornographic comics) was provided,⁴ and respondents were asked how often they had seen each of them in the past 1 or 2 years. The response categories were 1 (*never*), 2 (*once or twice per year*), 3 (*once or twice per month*), 4 (*once or twice per week*), and 5 (*nearly every day*). The seven items were added to create an index of pornography exposure in traditional media ($M = 1.37$, $SD = .56$, Cronbach's $\alpha = .84$).

Premarital Permissive Attitudes. Based on previous research (Cernada, Chang, Lin, Sun, & Cernada, 1986), items measuring premarital permissive attitudes included respondents' views on unmarried people holding hands, kissing, love touching, and sexual intercourse. Each respondent was asked to indicate his or her agreement, on a scale from 5 (*strongly agree*) to 1 (*strongly disagree*), with these intimate actions by unmarried men or women with a casual partner. Principal component factor analysis showed that the items measuring sexually permissive attitudes toward a casual partner were grouped in a single factor measuring the same underlying concept. Thus, the four items formed an attitude index. The one-factor solution explained 67.66% of the total variance (eigenvalue = 2.71, Cronbach's $\alpha = .84$). A measure of premarital permissive attitudes was created by adding the four items and dividing by 4 ($M = 2.92$, $SD = .98$).

Attitudes Toward Extramarital Sex. Respondents were asked to express their agreement, on a scale from 5 (*strongly agree*) to 1 (*strongly disagree*), with the following three statements reflecting their attitudes toward extramarital sex: (a) "It is allowable for married men to have extramarital sex," (b) "It is allowable for married women to have extramarital sex," and (c) "It is allowable for married men/women to have more than one sex partner." Principal component factor analysis showed that the three statements were grouped in a single factor and measured the same underlying concept. The one-factor solution explained 80.58% of the total variance (eigenvalue = 2.42, Cronbach's $\alpha = .88$). The three items were combined to form an index of attitudes toward extramarital sex ($M = 1.67$, $SD = .87$).

Sexually Permissive Behavior. Each respondent was also asked how often he or she had experience in holding hands, kissing, love touching, and sexual intercourse

with a casual partner. The response categories were 1 (*never*), 2 (*seldom*), 3 (*occasionally*), 4 (*sometimes*), and 5 (*often*). These four items were also recoded by combining categories 2 and 3 into a single *seldom* category (category 2) along with 1 (*never*), 3 (*sometimes*), and 4 (*often*) to form a new 4-point scale. Principal component factor analysis confirmed that the four items were loaded in a single factor and measured the same underlying concept. The one-factor solution explained 69.71% of the total variance (eigenvalue = 2.79, Cronbach's $\alpha = .80$). A measure of sexually permissive behavior was created by adding the four items and dividing by 4 ($M = 1.32$, $SD = .52$).

Control Variables. Control variables included both the respondents' general media exposure including newspaper reading, television viewing, magazine reading, and Internet use, and their demographic background (e.g., gender, age, and religion). Newspaper reading was measured with a single question: "How much time do you usually spend in an average day reading newspapers?" Television viewing, magazine reading, and Internet use were measured with a similar question. Religious belief was measured in four ordinal categories ranging from 1 (*no religious belief*) to 4 (*strong religious belief*) ($M = 1.84$, $SD = .91$). The rationale was that previous studies had indicated that religious belief was a significant predictor of sexual attitudes and behavior (Greenberg, Linsangan, & Soderman, 1993).

Results

Among the 2,001 respondents in the sample, 94.1% of them had at least one computer at home, with 30% of them owning two or more. The average time spent using the Internet was 62.94 minutes ($SD = 77.78$) per day. About 70% of the respondents had navigated the Internet; 38% indicated they had surfed pornographic Web sites.

Correlation Analysis

The first stage of the analysis was to test the first three hypotheses. Pearson correlations were used to test the bivariate relationship between Internet pornography exposure, sexually permissive attitudes toward both premarital and extramarital sex, and sexually permissive behavior.

The first hypothesis predicted that Internet pornography exposure would be positively correlated with premarital permissive attitudes. This hypothesis was supported. Exposure to Internet pornography was significantly related to premarital permissive attitudes ($r = .30$, $p < .001$). The second hypothesis predicted that Internet pornography exposure would be positively correlated with attitudes toward extramarital sex. This hypothesis was also supported. Exposure to Internet pornography was significantly linked to attitudes toward extramarital sex ($r = .28$, $p < .001$). The third hypothesis predicted that Internet pornography exposure would be positively correlated with

sexually permissive behavior. It was supported as well. The correlation between exposure to Internet pornography and sexually permissive behavior was significant ($r = .34, p < .001$).

Regression Analyses

The second stage of the analysis focused on exploring the research question on whether exposure to Internet pornography would be a stronger correlate of adolescents' sexual permissive attitudes and behavior than would exposure to traditional forms of pornography. Three separate hierarchical regression analyses were performed. Table 1 summarizes the results of the hierarchical regression analyses in which age, gender, and religion were entered first into the equation, followed by newspaper reading, television viewing, magazine reading, and Internet use. The final block included the exposure to pornography in traditional media and on the Internet. The standardized regression coefficients reflect the strength of relationships between each predictor variable and the criterion variables while controlling for the overlapping influence of other predictor variables.

As Table 1 shows, gender showed a significant relationship with premarital permissive attitudes toward a casual partner ($\beta = .08, p < .001$). Boys exhibited a significantly higher level of premarital permissive attitudes than did girls. Results also showed that television viewing ($\beta = .08, p < .001$) and pornography exposure in traditional media ($\beta = .07, p < .01$) were related significantly to premarital permissive attitudes. In addition, Internet pornography exposure emerged as the strongest correlate of premarital permissive attitudes ($\beta = .20, p < .001$). These results provided additional evidence for the definite linkage between exposure to Internet pornography and premarital permissive attitudes among adolescent Internet viewers (the concern of the first hypothesis).

Regarding attitudes toward extramarital sex, the regression analysis showed that gender was a significant correlate of attitudes toward extramarital sex ($\beta = .11, p < .001$). Pornography exposure in traditional media was also significantly related to attitudes toward extramarital sex ($\beta = .12, p < .001$). Consistently, the results showed that Internet pornography exposure was again the most powerful correlate of attitudes toward extramarital sex ($\beta = .15, p < .001$)—those who had a higher level of exposure to Internet pornography were more likely to accept extramarital sex. These particular results provided additional evidence to support the unequivocal linkage between exposure to Internet pornography and adolescents' attitudes toward extramarital sex (the concern of the second hypothesis).

Finally, the results show that religious belief ($\beta = .05, p < .05$), magazine reading ($\beta = .11, p < .001$), and Internet use ($\beta = .06, p < .05$) were significant correlates of sexual behavior. In addition, the relationship between exposure to Internet pornography and sexually permissive behavior was the strongest ($\beta = .19, p < .001$), followed by pornography exposure in traditional media ($\beta = .13, p < .001$). Altogether, the results of

Table 1
Hierarchical Regression Analyses of Sexually Permissive Attitudes and Behavior and Attitudes Toward Extramarital Sex on Demographic Variables, Media Exposure, and Pornographic Media Exposure

Steps/Variables	Premarital Permissive Attitudes	Attitudes Toward Extramarital Sex	Sexually Permissive Behavior
Block 1: Control variables			
Age	.01	.04	.03
Gender	.08***	.11***	-.01
Religion	.01	-.04	.05*
<i>R</i> ² (%)	3.5%	4.8%	3.0%
Block 2: General media exposure			
Newspaper reading	-.02	.02	.00
Television viewing	.08***	-.03	.01
Magazine reading	.00	.03	.11***
Internet use	.03	-.01	.06*
Incremental <i>R</i> ² (%)	1.3%	0.2%	3.2%
Block 3: Pornography exposure			
Traditional porn exposure	.07**	.12***	.13***
Internet porn exposure	.20***	.15***	.19***
Incremental <i>R</i> ² (%)	4.7%	4.4%	6.3%
Final <i>R</i> ² (%)	9.5%	9.4%	12.5%

Note: Beta weights from final regression equation with all blocks of variables in the model. Gender was coded as 1 = male, 0 = female. Religious belief ranged from 1 (*no religious belief*) to 4 (*strong religious belief*). Pornography exposure in traditional media was coded as 1 = *never*, 2 = *once or twice per year*, 3 = *once or twice per month*, 4 = *once or twice per week*, and 5 = *nearly every day*. Exposure to Internet pornography and sexually permissive behavior were coded as 1 = *never*, 2 = *seldom*, 3 = *sometimes*, and 4 = *often*. Sexually permissive attitudes and attitudes toward extramarital sex ranged from 1 (*strongly disagree*) to 5 (*strongly agree*).

p* < .05. *p* < .01. ****p* < .001.

the three regression models demonstrate consistently that Internet pornography exposure was the strongest correlate of sexually permissive attitudes and behavior when influences of other predictor variables were taken into account.

Chi-Square Tests

The fourth hypothesis predicted that male adolescents would have a higher level of exposure to Internet pornography than would female adolescents. A series of chi-square tests were run to test this hypothesis. Table 2 presents frequencies of ex-

Table 2
Frequency of Exposure to Eight Pornographic Media
Among Taiwanese High School and Middle High School Students

Type of Pornographic Medium	Frequency of Exposure						χ^2 Value	
	Total		Male		Female			
	Exposure ^a (%)	n	Exposure ^a (%)	n	Exposure ^a (%)	n		
R-rated films (theater)	8.8	1,994	10.6	998	6.9	996	8.49**	
R-rated rental films	20.0	1,990	28.5	995	11.6	995	89.53***	
R-rated films/programs (on cable)	26.4	1,995	32.4	998	20.5	997	36.36***	
Sexually explicit films on special cable channels	17.9	1,993	24.8	998	10.9	995	66.51***	
Pornographic magazines	17.3	1,990	25.1	997	9.5	993	84.77***	
Pornographic books	27.4	1,993	27.5	997	27.2	996	0.19	
Pornographic comics	37.7	1,988	48.7	992	26.7	996	102.28***	
Internet pornography	37.9	1,992	56.0	997	19.8	995	276.80***	

^aExposure is at least once or twice per year.

** $p < .01$. *** $p < .001$.

posure to the seven pornographic media and Internet pornography for the high school and middle high school students in the sample. The most used medium was Internet pornography, with 37.9% of the respondents reported having been exposed to it in the past 2 years. Pornographic comics were next on the list (37.7%), followed by pornographic books (27.4%), R-rated programs on cable television (26.4%), R-rated rental films (20.0%), and sexually explicit films on special channels of cable television (17.9%). R-rated films in movie theaters received the lowest viewership rating, with only 8.8% of the respondents reporting having seen them.

Results show that boys consistently reported seeing much more pornographic media overall. The greatest discrepancy was for exposure to Internet pornography, with 56% of the boys and only 19.8% of the girls reporting at least some exposure in the past 2 years. Taken as a whole, the data indicate that about 38% of the respondents in the sample reported at least some exposure to Internet pornography, with boys reporting significantly higher exposure frequencies than girls, $\chi^2(1, N = 1,992) = 276.80, p < .001$. The fourth hypothesis was supported accordingly.

Discussion

This study examines use of Internet pornography by Taiwanese adolescents and the relationship between exposure to Internet pornography and the sexual attitudes and behavior of surveyed teens. The results show that nearly 40% of the surveyed Taiwan-

ese adolescents had at least some exposure to Internet pornography, with boys reporting significantly higher exposure frequencies than girls. The results also indicate that Taiwanese adolescents used Internet pornography more frequently than traditional pornographic sources such as magazines, books, and comics.

Further, the exposure to Internet pornography relates to greater acceptance of sexual permissiveness and the greater likelihood of engaging in sexually permissive behavior. One of the main concerns about the effects on adolescents' permissive attitudes and behavior is that they may undermine family-taught values against premarital and extramarital sex (Zillmann & Bryant, 1988). In pornographic media, men and women are depicted engaging in varied sexual behaviors without love or emotional involvement, and many of those depicted have sexual relations with more than one person (Prince, Goldfarb, & Messaris, 1987; Zillmann & Bryant, 1989). Sexual activities tend to deemphasize intimacy, love, affection, and human connection (Jensen & Dines, 1998). Previous experimental studies (e.g., Zillmann & Bryant, 1989) found that exposure to traditional pornography resulted in greater acceptance of premarital and extramarital sex and nonexclusive sexual behavior. The correlational findings of this study, though modest, are consistent with earlier results.

Finally, results of multivariate analyses show that the relative influence of exposure to Internet pornography was greater than that of exposure to pornographic content in traditional media. In fact, exposure to cyberporn was the strongest correlate concerning permissive attitudes and behavior in all three regression models. This means that with other variables like demographics, general media use, and exposure to traditional pornography being controlled statistically, the relationships between Internet porn exposure and attitudes toward premarital and extramarital attitudes as well as sexually permissive behaviors were sustained.

Although the relationship of a particular independent variable and the dependent variable can be made more certain in multivariate analysis (Lewis-Beck, 1980), this study is primarily a correlational, not causal, design, intending to ascertain the linkages between exposure to Internet pornography and respondents' sexual attitudes and behavior. Moreover, the nature of the significant relationships between exposure to Internet pornography and teen attitudes toward sexuality and their sexual behavior remains unclear. It may well be the case that sexually active adolescents aggressively seek the interactive and multimedia-based pornographic materials of cyberspace. The one-shot survey design makes it impossible to ascertain the bidirectional relationships and to draw any causal conclusions. This is a major limitation of this study. Experimental research and longitudinal studies are clearly the direction for future research in establishing causal relationships between using Internet pornography and a range of permissive sexual attitudes and behavior. They will improve on the correlational findings of this study. In addition, this study focused narrowly on the relationship between use of Internet pornographic content and teens' sexually permissive attitudes and behavior. More studies can expand the range of dependent variables such as attitudes toward women in general and the rape myth in particular.

Another limitation of this study lies in the limitation of self-reported data. The frequency of sexually permissive behavior, modal attitudes toward extramarital sex, and

sexually permissive behavior, for example, were skewed toward the categories of *never* or *strongly disagree*, although such data are comparable with previous surveys on adolescents' media use and sexuality in Taiwan (Lin & Lin, 1996; Lo et al., 1999). Respondents may well have provided truthful responses. On the other hand, social demand characteristics may have been at work. Future studies need to reduce the influence of social demand characteristics by conducting interviews in situations in which respondents can do the questionnaire without the presence of others.

Finally, the study's findings show weak relationships between control variables such as age, gender, and religion and sexually permissive attitudes and behaviors. In contrast, studies (Malamuth & Impett, 2001) conducted in the United States found that an individual's background—age, gender, and personality among other things—had strong effects. Thus, it remains to be seen whether the results of this study can readily be generalized to other countries, especially because most pornographic effect studies have focused on American audiences. In addition, using a sample drawn from Taiwan, the results need to be interpreted with caution, as Taiwanese students may differ from their American counterparts in using the Internet and surfing pornographic Web sites.

Notes

¹Operationally, high interactivity means each Web site is linked to three separate subpages that contained another three links, and medium interactivity means each Web site is linked to three separate subpages. Low interactivity is defined as all Web site information that was depicted on a single page.

²There is no Institutional Review Board system in Taiwan as in the United States. Ethics approval is handled primarily by individual researchers. The approval of this survey is consistent with similar large-scale surveys conducted in Taiwan.

³Specifically, our sample closely matched the gender ratio of the population of middle and high school students in Taipei. The ratio between male and female students among middle schools is 52.14% versus 47.86%; the same ratio among high school students is 48.67% versus 51.32%. A chi-square test shows that there is no difference between the sample and population, $\chi^2(1, N = 2,001) = 0.767, p < .05$. Regarding age, there are no official statistics about the age averages of students in public schools. Normally, adolescents between 12 and 15 years old are eligible for middle schools, and those between 15 and 18 years old are eligible for high schools. Given the large sample size, the average age of our sample should be representative of the studied population.

⁴Each film is assigned a rating from G (suitable for all ages) to R (no one under the age of 18 admitted) on sexual content in Taiwan. The film rating system has no X-rating because films or programs are prohibited from showing male or female genitals. Although X-rated films imported from Japan, Europe, and the United States may be available in video shops (probably illegally), most Taiwanese categorize these sexually explicit films as "restricted pornographic films." Therefore, in this study pornographic media does not have an X-rated category.

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