

**Explaining Use of Online Pornography:  
A Test of Self-Control Theory and Opportunities for Deviance**

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Few studies draw upon contributions from criminology to develop empirical explanations for Internet pornography use. This study examines the relationship between low-self control (Gottfredson & Hirschi, 1990) and variations in two online behaviors: downloading pornographic images and visiting sexually explicit sites. Based on a survey of 134 Midwest undergraduates, this study found that low self-control has significant direct effects on pornography use, and that opportunities for downloading pornography are mediated by gender and self-control. However, low self-control was only responsible for small variations in online pornography use, with most of the direct effects attributed to being male. Future research on the study of this particular Internet deviance should continue to search for alternative gender-specific mechanisms to account for these influences.

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*Keywords:* Internet pornography; self-control theory; online deviance

## **INTRODUCTION**

Much like print and video technologies in the past, the Internet has played a revolutionary role in the social organization and distribution of pornography. In fact, some researchers have argued that the Internet has changed the cultural dimensions of pornography, since the Internet appears to offer a greater variety of images to a larger audience at low cost (Lane, 2000; Williams, 1999). While frequency of access to Internet pornography is assumed to exceed other forms, such as pornographic magazines and videos/movies, little research has been done to test this assumption. Moreover, few projects have attempted to explain the influence of individual motivations and social situations on accessing online pornography. As Cooper, Scherer, Boies, and Gordon (1999) conclude, "Very little empirical data exists on the characteristics or motivations of individuals who access sexually explicit sites. There is some sense that Internet users are likely not to constitute a unitary group but rather to form diverse subgroups" (p. 159).

Pornography continues by most definitions to be considered deviant and has been subject to control by the state within the limitations of the law (Alexander, 2002; Linz & Malamuth, 1993). Yet, findings from the General Social Survey over the last 30 years show that 25-30% of respondents consistently report having viewed pornography in its various technological forms (Buzzell, 2005). Nonetheless, as Goode (2005) and others (e.g., Tittle & Paternoster, 2000) have taught, frequency of the behavior does not necessarily change whether the behavior is considered by others to be deviant. In this regard, accessing pornography online, while frequent, also

constitutes a behavior that creates a negative reaction on the part of a variety of groups in society (Hawkins & Zimring, 1988; Sharpe, 2005). These negative social reactions are manifest in a number of mostly federal attempts to implement controls over various aspects of Internet pornography availability, although with limited success.

This study was designed to advance current research on online pornography use and Internet deviance by testing a theory-based explanation of two forms of online behavior: (a) downloading pornography from the Internet, and (b) visiting sexually explicit websites. Based on the concept of low self-control as theorized by Gottfredson and Hirschi (1990), it was hypothesized that aspects of impulse, risk seeking, and temperament were related to downloading pornography and visiting sexually explicit websites. The study also posited that conditions of social context surrounding the use of the computer could mediate the effects of self-control and, as a result, accessing Internet pornography. This discussion begins with a brief overview of the nature of Internet pornography use, especially in light of current public policy concerns related to this behavior. The analysis then considers the theoretical relevance of self-control theory to understanding pornography use as a form of deviant behavior. A test of this theory is then presented using the results of a survey of undergraduate students. Specifically, the study examined the associations between six dimensions of self-control and pornography use, the direct effects of low self-control on two forms of online pornography use (downloading pornography and visiting sexually explicit websites), and the mediating effects of social opportunities for pornography use. Based on the findings, this study calls for additional research that draws from criminological frameworks applicable to online pornography use.

### **PORNOGRAPHY ONLINE**

While empirical understanding of the actual number of online pornography sites remains virtually non-existent, some evidence provides a glimpse into the extent to which pornography is distributed through sites in cyberspace. A number of reports agree that the Internet has significantly expanded the availability of pornography to different populations (Cooper et al., 1999; Lane, 2000; Thornburgh & Lin, 2002). The National Research Council cites testimony that “subscription sites with adult content exceed 100,000 in the United States with each site having multiple Web pages underneath it” (Thornburgh & Lin, 2002, p. 72). Additionally, the Council reports that pornography constitutes “a significant amount of web traffic” (Thornburgh & Lin, 2002, p. 72). Lane’s (2000) study of the pornography industry offers one of the most extensive historical analyses of the organization of pornography online, suggesting that revenues from the sale of online pornography may reach \$2 billion. There is considerable agreement that the Internet has revolutionized how pornography is distributed and accessed in a variety of social and personal contexts.

In addition to concerns with the power of the technology to create access to more pornography and different forms of pornography, policy makers and law enforcement agencies are also concerned with the role of the Internet in constructing a unique electronic infrastructure that enhances the distribution of pornography worldwide to different audiences. Most concern focuses on making pornography available to children. In the most comprehensive study to date of children’s exposure to online pornography, Mitchell, Finkelhor, and Wolak (2003) found that about one fourth of their sample of youth regularly had one or more unwanted exposures to

pornography. Almost three fourths of these encounters occurred while surfing the net, and 27% happened by opening an e-mail. Others have concluded that Internet technology has become even more significant to the distribution of child pornography. Quayle and Taylor (2002) concluded that the Internet has fostered the creation of a worldwide system of distribution of child pornography and affords individuals unprecedented access to pornographic images of children. Given these forms of online victimization, and the possibility of access to pornography being multiplied by virtually any connection to the Internet, a more empirical understanding of the characteristics and motivations of persons accessing online pornography is needed.

There is also significant policy interest in this topic as well, especially in light of public concerns about the morality of online pornography access, often combined with fears that children using the Internet are at greater risk of victimization. In November 2004, Republican Senator Sam Brownback (R-Kansas) held hearings on online pornography use, equating its addictive qualities with those of heroin (Subcommittee on the Constitution, Civil Rights, and Property Rights, November 10, 2005). In July 2005, Senate Democrats proposed a 25% tax on all online Internet pornography transactions. This legislation was based on a report by a Washington D.C. think-tank (Barney, Kott, & Dillon, 2005), which concluded that the online pornography industry had become so large and lucrative that children can easily access pornographic images. In April 2006, a teenager testified before a Congressional subcommittee on how his creation of a pornographic website was easily done with current technology and, apparently, was profitable, boasting a client list of 1,500 subscribers (Subcommittee on Oversight and Investigations, April 4, 2006). To some extent, current Congressional attention in the form of hearings and attempts at policy creation to address concerns over pornography use have grown out of the perceived failures of the Communications Decency Act (1996), which some complained was never a feasible control of online pornography access (Thornburgh & Lin, 2002). In light of the continued policy interest in the control of pornography, more research needs to be done to inform efforts at social control based on an empirically informed understanding of the societal forces that create demand for pornographic material (Hawkins & Zimring, 1988).

### **THEORY-BASED EXPLANATIONS OF ONLINE PORNOGRAPHY USE**

Few research projects have attempted to explain Internet pornography use based on theory from the fields of deviance and criminology. In fact, much of the current research that exists on Internet pornography use is predominantly psychological in focus (Cooper et al., 1999; Donohew et al., 2000). Recent studies of online deviant and criminal behaviors demonstrate that criminological theory may have some utility in the explanation of emerging deviant behaviors in this technological context. For example, Higgins (2004, 2005) found that online piracy is related to low self-control and that this effect may in fact be connected to learning pirating behavior in peer contexts. Earlier, Skinner and Fream (1997) found that online piracy of music and software was related to social learning, fostered in peer interactions that may, for example, be associated with sharing music files online. Stack, Wasserman, and Kern (2004) applied a general test of social bonding theory to Internet pornography use based on responses to the General Social Survey, which included items measuring frequency of visits to sexually explicit websites. They found a relationship between likelihood of visiting sexually explicit websites, ties to religion, and marital unhappiness. Visiting these websites was also linked to prior sexual deviance, especially

for male subjects. But the authors only speculated as to why gender differences were so pronounced, calling for greater attention to these patterns in future projects.

One theoretical framework that may be useful to the study of online pornography use is the general theory of crime (Gottfredson & Hirschi, 1990). The framework posits that deviance is a function of failed socialization in childhood, resulting in low levels of self-control in adolescence and early adulthood. Persons with low self-control are in a ready state for deviant behaviors. Research has linked low self-control to a variety of criminal behaviors (Evans, Cullen, Burton, Dunaway, & Benson, 1997; Pratt & Cullen, 2000), and different deviant behaviors (Arneklev, Grasmick, Tittle, & Bursick, 1993; Jones & Quisenberry, 2004). The theory garners widespread empirical support.

The general theory of crime (also referred to as self-control theory) seems appropriate here for a number of reasons. First, Gottfredson and Hirschi (1990) originally noted the long-standing finding in criminological research that crime was predominantly a male phenomenon. In an effort to account for this finding, they suggested that low self-control was a function of differences in family socialization patterns for boys and girls. Tittle, Ward, and Grasmick (2003) noted the consistency in prior research showing that males in fact are more crime prone, and in their own test of the theory suggested that “self-control is interpreted by gender” (p. 426). In light of the established connection between gender and pornography use (Barron & Kimmel, 2000; Stack et al., 2004), self-control theory may provide a gender-based explanation that accounts more specifically for this connection.

Second, studies of low self-control have identified characteristics of behaviors that emerge as a result of failures in socialization. Psychologists have connected some of these characteristics to a variety of sexual deviances, including early sexual activity or risky sex. These particular behaviors are a function of dysfunctional sexual socialization experiences and have been associated with impulse control, risk seeking, and early childhood experiences (Donohew, et al., 2000; Whitbeck, Yoder, Hoyt, & Conger, 1999). More specifically, Hope and Chapple (2005) found that low self-control had direct and indirect effects on a variety of adolescent sexual behaviors, such as having multiple sex partners. These findings suggested that there may be utility in examining the relationship between sexual deviance and the six dimensions of self-control identified in the general theory of crime: impulsivity, desire for simple tasks, preference for physical activity, self-centeredness, risk seeking, and temper. LaGrange and Silverman (1999) examined the effects of the six dimensions of self-control on a variety of behaviors, and concluded that certain deviant acts may be influenced more or less by different aspects of self-control. These aspects of self-control may be relevant in the study of online pornography use.

Third, pornography use has been associated with some crimeogenic tendencies and thus, would be appropriate to research that treats pornography use as a dependent variable. In an extensive review of the literature on pornography use and aggression, Malamuth, Addison, and Koss (2000) noted that many studies find some correlation between pornography use, attitudes about aggression, and sexuality, although their review highlighted the mixed nature of these results. Lussier, Proulx, and LeBlanc (2005) found that “sexualization and deviant sexual interests” (p. 250), including pornography use, accounted for some variation in sexual aggression patterns among a sample of sex offenders. Carr and VanDeusen (2004) identified pornography

use (including access to Internet pornography) as a correlate of sexual aggression by college males. While pornography use typically fails to emerge as a causal factor in sexual aggression, it consistently appears as a behavior that Gottfredson and Hirschi (1990) would treat as an analogous behavior to other deviant acts.

Finally, research suggests that pornography use is affected by a number of situational contexts or opportunities for accessing pornographic material. Laumann, Ellingson, Mahay, Paik, and Youm (2004) and Laumann, Gagnon, Michael, and Michaels (1994) found use of pornography was associated with situations in which couples incorporated pornography into sexual interactions. Their research also found that men not in relationships may incorporate pornography into sexual practices related to masturbatory fantasies. These conditions suggest situational contexts that would affect pornography use. Opportunities for deviance were considered crucial in the framework originally outlined by Gottfredson and Hirschi (1990). Some research has shown opportunity factors mediating low self-control (LaGrange & Silverman, 1999; Smith, 2004), where some adolescents stand primed for criminal behaviors and, when facing the right opportunities, might engage in criminal acts. Higgins and Ricketts (2004), however, found that opportunities for deviance did not mediate the relationship between low self-control and deviance. As they and others concluded, the significance of opportunity as a factor combined with low self-control deserves more study.

As an exploratory analysis of the utility of the general theory of crime (deviance) in explaining Internet pornography use, the current analysis examined three research questions:

1. Does low self-control predict (a) frequency of visiting sexually explicit websites, and (b) frequency of downloading pornographic images?
2. Which of the six dimensions of low self-control have greater explanatory power (if any) in predicting (a) frequency of visiting sexually explicit websites, and (b) frequency of downloading pornographic images?
3. Does online pornography use increase with low self-control and greater opportunities for use of Internet pornography?

## **METHOD**

A web-based survey was conducted using a snowball sampling method to contact students attending two small Midwestern universities. The survey instrument was constructed using a commercially available online survey program. Questions about Internet behavior, attitudes about online behaviors (including some criminal and deviant), as well as measures of self-control and opportunity were included in the instrument. Responses to questions required subjects to select answers that best described their attitudes and behaviors by selecting boxes set up in the survey webpage. The instrument was pilot-tested prior to being launched online and took an average of 15 minutes to complete. This method seemed particularly suited to the study of Internet users, college populations, and for assuring anonymity of self-reported deviant behavior(s) (Bailey, Foote, & Throckmorton, 2000). The questionnaire was distributed over a period of 4 weeks in the months of March and April 2005.

Since the focus of the study was on college populations and their online activity, participation in the study was limited to individuals 18-23 years of age. Informed consent was given by reading the survey site frontpage and then proceeding to complete the questionnaire. Persons who completed the survey were asked to invite at least one other individual to participate in the study by emailing the link to the survey website where the instrument could then be completed and submitted automatically to the survey server. To guard against multiple submissions, the survey server provided ISP addresses in the final dataset as a way to check for respondents completing the survey more than once from a particular ISP address. Analysis of the ISP addresses found no duplicates, suggesting no multiple submissions.

### ***Dependent Variables***

The survey instrument included items designed to measure frequency of two forms of pornography access: (a) downloading pornography from the Internet, and (b) visiting websites with sexually explicit images. These behaviors were treated as different actions, each with unique characteristics. Downloading images such as .jpg files, for example, requires certain knowledge about file transfers from webpages or from peer to peer exchanges such as in email. This behavior is different from using a web search engine to identify websites to visit or navigating a web browser to view an adult website. Respondents were asked to indicate “how often in the last six months” they had downloaded pornography from an online source (1 = *never* to 5 = *more than five times*). This variable was distinguished from having visited a “website with sexually explicit images” in the past 30 days (1 = *never* to 5 = *more than five times*).

### ***Independent Variables***

*Self-Control.* Self-control was measured using the original 24-item scale devised by Grasmick, Tittle, Bursik, and Arneklev (1993). The index measured six cognitive dimensions of self-control originally identified by Gottfredson and Hirschi (1990): (a) impulsivity, (b) simple tasks, (c) risk seeking, (d) physical activity, (e) self-centeredness, and (f) temper. The Cronbach’s alpha reliability coefficient for the 24-item index used in this study was .82, suggesting high internal reliability for the measure.

*Opportunity.* The opportunity measures used in the survey were based on prior research by Buzzell (2005), who examined relationships between social contexts, settings in the subject’s social environment, and Internet pornography use. The dimensions of opportunity studied here were: (a) access, (b) sophistication, and (c) monitoring.

**Table 1***Descriptive Statistics for Variables (N = 134)*

	<b>Mean</b>	<b>SD</b>	<b>Value Range</b>
1. In the past six months how often have you downloaded sexually explicit images off the Internet?	1.93	1.48	1 to 5
2. How often in the past 30 days have you visited a website with sexually explicit images?	2.06	1.42	1 to 5
3. Sum of self-reported deviant acts in the last 6 months.	2.40	1.56	1 to 10
4. Low self-control	51.93	7.18	24 to 120
5. Sum of locations where respondent uses the Internet.	2.69	1.19	1 to 7
6. Hrs daily net use	3.57	1.36	1 to 7
7. Since high school would you say that your use of the Internet has:	4.39	0.89	1 to 5
8. How many of your friends do you talk to using instant messaging?	2.87	1.16	1 to 5
9. How many of your friends do you talk to using email?	2.88	1.07	1 to 5
10. Its easy to learn new online techniques by watching what my friends do:	2.93	0.58	1 to 5
11. How many hours per week do you use the Internet where friends or a roommate can see you?	2.83	1.51	1 to 7
12. How many hours per week do you use the Internet in a public setting?	2.53	1.19	1 to 7
13. How many hours per week do you use the Internet alone?	2.89	1.59	1 to 7
14. Gender (male = 1)	.53	.50	
15. Age	20.75	1.31	18 to 23

Three measures of access were included in the survey. First, respondents were asked to report the actual number of locations (e.g., apartment, dorm room, library, classroom lab, etc.) in which they had Internet access. This summative index ranged from a low of one to a high of seven locations. Second, respondents were asked to indicate whether their use of the Internet had *significantly decreased* (1) or *significantly increased* (5) since high school. This index measured the significance of the transition from high school to the relative freedom associated with college life in fostering access to the Internet. Finally, respondents were asked to report the actual number of hours per day they used the Internet. This operationalized the concept that the more hours spent online, the greater the potential access to Internet sites.

Opportunities for online pornography use may also be affected by the sophistication of users. Three measures of sophistication were used in the analysis. The first measure asked subjects to indicate how many friends they talked to using instant messaging (1 = *none* to 5 = *all of them*). The second measure asked respondents how many of their friends communicated with email (1 = *none* to 5 = *all of them*). The final measure of sophistication had respondents indicate whether they *strongly disagreed* (1) or *strongly agreed* (5) with the statement that “it is easy to learn new computer techniques by watching others.” The easier it is to learn online techniques, the more sophisticated the user and, thus, the greater the opportunity for online pornography use.

Individuals who reported high levels of interpersonal monitoring of online activity are hypothesized here to have fewer opportunities for online pornography use. Respondents were asked to report how many hours per week they (a) used the net while alone, (b) used the net while in public, and (c) used the net while a friend or roommate could see the use. The reported hours were then scaled with one reflecting *zero or no hours* and seven reflecting *16 hours or more* of being online. Thus, the higher the score on this index, the greater the level of interpersonal monitoring found in the subject’s social environment.

### ***Participants***

A total of 134 valid responses were received, with 53% of the respondents being male and 47% female. The ages of respondents completing the survey ranged from 18-23 years ( $M = 20.75$ ,  $SD = 1.31$ ). Most respondents were white (86.6%), one-fourth of the students reported working more than 20 hours a week, and nearly 90% indicated they owned a personal computer. Descriptive statistics for the respondents are reported in Table 1 for all variables used in the analysis.

## **RESULTS**

The survey found that 47% of respondents had visited a sexually explicit website in the last 30 days, while 36% had downloaded pornography off the Internet. Thus, visiting sexually explicit websites was the most common behavior among respondents in this sample. Of those visiting sexually explicit websites, 21% did so once or twice a month, while 13% reported this behavior more than five times a month. Just over 11% of those who reported downloading pornography off the Internet did so once or twice in the prior 6 months, while nearly 14% reported downloading pornography more than five times in the past 6 months.



**Table 2***Bivariate Correlations of Variables (N = 134)*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Download porn	--														
2. Visit porn website	.66**	--													
3. Analogous acts	.46**	.47**	--												
4. Low self-control	.35**	.33**	.29**	--											
5. Access index	-.20*	-.08	.00	-.16	--										
6. Hrs daily net use	.01	.09	-.04	.14	.04	--									
7. Use since K12	.05	-.01	-.06	-.01	.08	.29**	--								
8. Use IM	.13	.05	-.11	.14	.14	.19*	.18	--							
9. Use email	.02	-.11	-.28**	-.16	.18*	.20*	.32**	.36**	--						
10. Watch others	-.03	-.04	-.00	.06	.05	-.05	.12	.12	.00	--					
11. Friend see use	-.04	-.06	-.07	-.07	.17	.11	.04	-.03	.20*	.20*	--				
12. Use net in public	.03	.05	.04	-.07	.13	.10	.02	-.16	-.02	-.10	.14	--			
13. Use net alone	.03	-.02	-.17	.09	.18	.29**	.24**	.26**	.13	.12	-.05	.14	--		
14. Gender (male = 1)	.56**	.62**	.39**	.27**	-.13	.06	-.21*	-.04	-.20*	-.14	-.04	.08	.01	--	
15. Age	-.12	-.07	-.22*	-.05	.05	.06	.07	-.28**	.16	-.22*	-.16	.21*	.00	-.14	--

\* $p < .05$ . \*\* $p < .01$ .

**Table 3*****Multiple Regression of Dimensions of Self-control and Online Pornography Use***

<i>Dimensions of Self-Control</i>	<b>Download Porn</b>				<b>Visit Porn Website</b>			
	<i>b(SE)</i>	<b>Beta</b>	<i>b(SE)</i>	<b>Beta</b>	<i>b(SE)</i>	<b>Beta</b>	<i>b(SE)</i>	<b>Beta</b>
Impulsivity	.149 (.09)	.165	.112 (.08)	.123	.118 (.09)	.137	.081 (.07)	.094
Simple tasks	.043 (.08)	.060	.133 (.07)	.187*	-.027 (.07)	-.039	.065 (.06)	.098
Risk seeking	.164 (.08)	.219*	.072 (.07)	.095	.112 (.08)	.157	.020 (.06)	.029
Physical activity	-.016 (.07)	-.025	.037 (.06)	-.057	.005 (.06)	.008	-.019 (.05)	-.031
Self-centeredness	.091 (.07)	.139	-.023 (.06)	-.034	.184 (.07)	.300**	-.068 (.06)	.110
Temper	-.016 (.07)	-.002	-.066 (.06)	-.010	-.022 (.07)	-.033	-.029 (.06)	-.045
Gender (male = 1)			1.573 (.26)	.535***			1.583 (.23)	6.774***
F	2.958**		8.893*		3.102***		10.408***	
R <sup>2</sup>	.101		.345		.157		.383	
N	105		105		106		106	

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 4**

*Multiple Regression with Self-control, Opportunity, & Downloaded Pornography*

Independent Variables	Model I		Model II		Model III		Model IV		Model V	
	<i>b</i> ( <i>SE</i> )	Beta	<i>b</i> ( <i>SE</i> )	Beta	<i>b</i> ( <i>SE</i> )	Beta	<i>b</i> ( <i>SE</i> )	Beta	<i>b</i> ( <i>SE</i> )	Beta
Gender	1.517 (.24)	.530***	1.341 (.24)	.469***	1.467 (.24)	.513***	1.496 (.25)	.512***	1.350 (.25)	.473***
Age	.069 (.09)	-.064	.064 (.09)	-.059	.055 (.09)	-.051	.052 (.10)	-.047	.086 (.09)	-.080
<i>Self-Control</i>										
Index			.046 (.02)	.232**	.045 (.02)	.229**	.047 (.02)	.231**	.048 (.20)	.240**
<i>Access</i>										
- net hrs/day					-.166 (.09)	-.152				
- use since high school					.348 (.13)	.222**				
- access index					-.121 (.09)	-.104				
<i>Sophistication</i>										
- IM friends							.035 (.12)	.027		
- email friends							.244 (.12)	.178*		
- learn Internet techniques							.029 (.20)	.012		
<i>Monitoring</i>										
- friends see use									.019 (.02)	.007
- use in public									.054 (.04)	.135
- use net alone									.010 (.02)	.018
F	21.097***		17.520***		10.963***		10.378***		9.742***	
R <sup>2</sup>	.279		.323		.365		.347		.344	
N	104		104		104		106		100	

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

**Table 5**

*Multiple Regression with Self-control, Opportunity, & Visited Pornography Website*

Independent Variables	Model I		Model II		Model III		Model IV		Model V	
	<i>b</i> ( <i>SE</i> )	Beta	<i>b</i> ( <i>SE</i> )	Beta	<i>b</i> ( <i>SE</i> )	Beta	<i>b</i> ( <i>SE</i> )	Beta	<i>b</i> ( <i>SE</i> )	Beta
Gender	1.643 (.22)	.596***	1.503 (.22)	.546***	1.556 (.23)	.565***	1.612 (.23)	.584***	1.606 (.23)	.583***
Age	.047 (.08)	.045	.051 (.08)	.049	.048 (.08)	.046	.091 (.09)	.085	.073 (.09)	.070
<i>Self-Control</i>										
Index			.035 (.02)	.186*	.036 (.02)	.188*	.030 (.12)	.159*	.035 (.01)	.184*
<i>Access</i>										
- net hrs/day					.018 (.09)	-.017				
- use since high school					.118 (.13)	.078				
- access index					.024 (.09)	.021				
<i>Sophistication</i>										
- IM friends							.053 (.11)	.045		
- email friends							.015 (.11)	.012		
- learn Internet techniques							.063 (.19)	.027		
<i>Monitoring</i>										
- friends see use									.007 (.02)	-.026
- use in public									.017 (.03)	.004
- use net alone									.063 (.02)	-.031
F	27.938***		21.159***		10.517***		11.524***		11.484***	
R <sup>2</sup>	.339		.365		.352		.371		.384	
N	105		105		105		107		101	

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

The analysis first examined correlations between the dependent variables, measures of self-control, and the three forms of opportunities for online activity. Overall, the correlation tests showed support for the hypothesized relationships between low self-control and both forms of online pornography use. The bivariate correlations reported in Table 2 show that visiting pornographic websites and downloading pornography both have positive, moderate associations with low self-control ( $r = .35$  and  $r = .33$ , respectively). Additionally, this study found positive, moderate correlations between analogous deviant acts and downloading pornography ( $r = .46$ ) and visiting sexually explicit websites ( $r = .47$ ), which is consistent with the theory of self-control. Only one measure of opportunity (access) was significantly associated with frequency of downloading pornography ( $r = -.20$ ), but this was not in the direction hypothesized. Other measures of opportunity were not significantly correlated with either of the two types of pornography use.

There were positive, moderate correlations between gender (included as a control variable; male = 1) and the two forms of pornography access studied (downloading pornography,  $r = .56$ ; visiting a pornography website,  $r = .62$ ). The correlation analysis also suggested that as subjects aged, there was a decline in frequency of pornography access, although this relationship was not statistically significant. There were also weak correlations between age and measures of opportunity. Older students were more likely to report less frequent use of instant messaging ( $r = -.28$ ) and were less likely to agree with how easy it is to learn new online techniques from others ( $r = -.22$ ). Lastly, there was a weak, positive correlation between age and the number of hours the respondent used the Internet in a public setting ( $r = .21$ ). Because of these associations, the analysis also included age as a control variable in the models estimated.

The regression analysis reported in Table 3 shows that the six different dimensions of low self-control affect downloading pornography and visiting pornographic websites in different ways. Risk seeking ( $b = .164$ ,  $p < .05$ ) had a positive, although weak direct effect on frequency of downloading pornography, and the effect of impulsivity was also positive (although non-significant). Having visited a pornographic website was positively affected by self-centeredness ( $b = .184$ ,  $p < .001$ ). However, these direct effects changed when controlling for gender in both models. Downloading pornography offline was directly affected by increased acceptance of simple tasks ( $b = .133$ ,  $p < .05$ ) when controlling for gender. Gender also had a substantial impact ( $b = 1.583$ ,  $p < .001$ ) on the reported frequency of visiting a sexually explicit website and, as a result, the influence of the six dimensions of self-control disappeared. Overall, these findings provide mixed support for the hypothesized influence of low-self control on the two forms of online pornography use.

Regression models were then estimated to examine the effects of the global index of self-control on downloading pornography and visiting sexually explicit websites in three different opportunity contexts: access, sophistication, and monitoring. These effects were also explored after controlling for gender and age. Again, the models revealed statistically significant, direct effects for gender on both forms of online pornography use: downloading pornography (Table 4) and visiting pornographic websites (Table 5). All models further showed that self-control had significant, direct effects on the two forms of online pornography use, even when controlling for gender, age, and three different opportunity contexts. The models explained between 28-38% of

the variance in the two forms of online pornography use studied. The analysis examined these findings in more detail for each of type of online pornography use studied.

The results reported in Table 4 show that self-control consistently had statistically significant, direct effects on frequency of downloading pornography. Model II shows that as self-control decreased, the frequency of downloading pornography increased as hypothesized ( $b = .046, p < .01$ ). This effect remained significant even when controlling for gender, age, and the three types of opportunity: access, sophistication, and monitoring. Models III, IV, and V indicate that some measures of opportunity were significant in explaining additional variance in downloading pornography. Specifically, persons who had increased their use of the Internet since high school ( $b = .348, p < .01$ ) and frequently emailed friends ( $b = .244, p < .05$ ) reported downloading pornography more often. However, using the Internet more hours per day did not result in the effects predicted. Also examined were the effects of having used the Internet for more hours in a public setting on frequency of downloading pornography. The effect here was not significant and not in the direction predicted.

Table 5 reports the results of the regression analysis for the second type of online pornography use studied: visiting sexually explicit websites. The results show significant, direct effects for self-control even when controlling for gender and age ( $b = .035, p < .05$ ), and the three opportunity contexts: access ( $b = .036, p < .05$ ), sophistication ( $b = .030, p < .05$ ), and monitoring ( $b = .035, p < .05$ ). However, as indicated in Models III, IV, and V, increased access, sophistication, and monitoring had no statistically significant, direct effects on visiting explicit websites. As a result, opportunity combined with low self-control does not appear to explain variations in the frequency of visiting sexually explicit websites.

## DISCUSSION

The purpose of this study was to examine the effect of low self-control on two forms of Internet deviance: visiting sexually explicit websites and downloading pornography offline. Moreover, the study was designed to explore which of the six dimensions of self-control were most strongly related to these two forms of pornography use, and to evaluate the effects of opportunities for online pornography use in varying social contexts. Overall, the analysis found general support for the hypothesized relationship between low self-control and both forms of Internet pornography use. As a deviant behavior, pornography use was also correlated with other deviant acts measured in the survey, which is a finding consistent with the general theory of crime. Gender, low self-control, and opportunities for use of online pornography explained significant variation in downloading pornography (28-37%) and visiting pornographic websites (34-38%). However, most of the variance in the two forms of Internet pornography use was attributed to the influence of gender (male). The significance of this finding is discussed later, but the overall contribution of low-self control to explaining Internet pornography use was not as robust as the theory would predict.

The study contributes four important findings to the current research on Internet pornography access. First, that gender was most significant to explaining variations in Internet behaviors related to pornography use. Second, that low self-control was related to two forms of Internet pornography use, although this relationship was weak to moderate at best. Third,

opportunities for online pornography behavior when combined with low self-control were directly related to variations in frequency of downloading pornography. Fourth, only two dimensions of low self-control were related to online pornography use. What do these mixed findings offer to the current understanding of explanations of Internet pornography use?

The greatest variation in downloading pornography and visiting sexually explicit websites is linked to being male. This is perhaps no surprise given the claimed relationship between gender and general pornography use. However, consistent with the observations of Tittle et al. (2003), identifying a causal mechanism of low self-control would help further explain just what it is about being male that accounts for greater deviance, in this case use of online pornography. The contribution of low self-control to the overall variance explained in the models that control for gender and age ranged from 3-4%. The project here predicted that low-self control would have accounted for greater variation in online pornography use given that the general theory of crime was situated in criminological research showing a connection between low-self control and deviant acts by males. The findings here are similar to those of Tittle et al. (2003), who concluded that “self-control does not appear to predict misbehavior equally well among various subcategories of individuals” including gender and age groups (p. 426).

This study also hypothesized that the general theory of crime would account for greater variance in two types of Internet pornography use independent of the effects of gender. But the results here are not as conclusive as predicted. This suggests that further study of what aspects of being male create interest in online pornography require exploration. Only recently have social scientists started the empirical process to account for this connection. For example, Barron and Kimmel (2000) suggested that gender roles influence male use of pornography, constructing roles in which men enact societal expectations about sexual fantasy and male roles in sex acts. Laumann et al. (1994, 2004) have described the association between gender and pornography as an outcome of sexual expression based on social scripts. These scripts are societal constructs enacted in sexual interactions which, for some subjects in their research, included use of pornography in sexual interactions. These explanations for why gender plays a role in pornography use may prove more fruitful than self-control theory in accounting for gender differences in Internet pornography use.

This study further contributes to current research on Internet pornography access by providing evidence for making distinctions in forms of online behavior. This is a distinction yet to be made in the literature. While self-control does predict variation in the two behaviors, opportunity mediates the effects of self-control with one type of online use: downloading pornography. This finding may provide insights into the gender dynamics discussed by Gottfredson and Hirschi (1990), who suggested that “gender differences may be due to differences in crime rather than criminality, and that differences in opportunity may account for much of the male-female difference in crime rates” (p. 147). In other words, the propensity to download pornography may be based in gender (male) and online behavior. This may be further associated with the stages of behaviors that constitute the act of downloading pornographic images from online sources. Gendered differences in the propensity to engage in the series of steps in downloading may be associated with gender differences in online activity. This is something future research will want to examine.

Access, sophistication, and monitoring were found to influence individual opportunities for downloading pornography from the Internet. The transition from high school to college appears to offer greater access to the Internet and, thus, opportunities for downloading activity. Moreover, emailing friends increases the opportunity for downloading pornography as well. As college students use the Internet more often for email exchanges, they may in fact also be engaged in peer to peer sharing of pornographic images. As the level of sophistication increases, so does the likelihood of downloading pornography. More perplexing is the negative relationship between being online more hours per day and more downloading of pornography, as well as the positive relationship between being online in public and more downloading of pornography. One explanation is that individuals who download pornography do so in an efficient manner, engaging in behavior that is highly focused or targeted to the outcome. One would predict that increased monitoring by the public would also discourage downloading behaviors. However, downloading behavior may prove easier to conceal than on-screen activity, as pulling up sexually explicit websites may be more readily witnessed by others near the computer. These aspects of access and monitoring, especially as they relate to different types of online pornography use, deserve further study.

Which dimensions of low-self control were related to online pornography use? This study found that risk seeking and self-centeredness were significant to variations in visiting explicit websites. This may be related to the relationship between pornography use and self-centeredness, which suggests that online pornography use, for some, is a behavior designed to satisfy individual (rather than partner-based) sexual urges, or is sought to avoid the high-cost game of finding a sexual partner (Laumann et al., 1994). In addition, persons with higher risk-seeking propensities may find a certain degree of thrill in securing pornographic material offline. In their study of adolescent sexual activity, Hope and Chapple (2005) explained some sexual behavior by identifying similarities between sex research, psychological research on risk seeking and impulsivity, and the claims in the general theory of crime. But, these patterns shift when controlling for gender. LaGrange and Silverman (1999) found that risk taking was the principle factor in explaining gender differences in a variety of delinquent behaviors. Future studies of online pornography use should examine these particular dimensions of low-self control, as they may shed more light on the gender effects revealed here, and afford insights that connect cognitive characteristics and pornography use.

Another venue for further work in this area stems from the criticism that the study here relied on a relatively small, homogenous sample. Future research should examine the relationship between low self-control and pornography use in larger, diverse populations. Very few studies of pornography use in the general population have been completed, although items in the General Social Survey offer new opportunities to examine Internet pornography use (Buzzell, 2005; Stack et al., 2004). In one of the few studies of human sexuality using a nationally representative sample, Laumann et al. (1994) provided clues about the nature of sexual scripts culturally created. These vary by gender, race, and to some extent social class. This may be a useful concept in further exploration of the association between gender, low self-control, and pornography use. Moreover, the study of pornography use in the general population could help us better understand pornography use among criminal populations, especially sex offenders. Research that further explores pornography as an analogous behavior could be useful in specifying the role of pornography in what appears to be a repertoire of past behaviors leading up



to sex crimes (Lussier et al., 2005). Introducing pornography into the list of analogous behaviors identified by Gottfredson and Hirschi (1990) may offer new directions in the study of pornography and aggression.

One should approach these results with a number of caveats in mind. The small sample size certainly limits the generalizability of the findings. Moreover, there are several limitations to this study commonly associated with web-based research (Birnbaum, 2004). A web-based survey may encounter threats to internal validity as a result of individuals completing the survey more than once. The web survey design used here could not prevent individuals from using another ISP site to complete the survey multiple times. While the web survey server did report the dataset with ISP addresses allowing the researchers to check for duplicate addresses, no mechanism was used to discourage multiple submissions. In addition, web-based surveys are sometimes plagued by respondent dropouts, especially when web-based instruments require respondents to click to move to the next section. Some respondents may have simply failed to do this. The sample here from two Midwestern universities places obvious limits on the generalizability of the findings. Additionally, the study surveyed individuals in a restricted age range, and there are important benefits to studying online deviance as well as online pornography use across age groups (Cooper et al., 1999). The survey may also be limited by self-presentation bias, as is common with snowball samples, especially those which ask respondents to report deviant behaviors. However, as an initial test of self-control theory, the analysis confirms the significance of gender in predicting pornography use including Internet pornography, and contributes to the current literature on self-control that finds ambiguous (Tittle et al., 2003) support for the theory in predicting one particular type of deviant behavior when controlling for gender, age, and other factors.

## CONCLUSIONS

At a more general theoretical level, this study offers mixed if not weak support for adding online pornography use to the growing literature that finds a connection between low self-control and a number of deviant acts. Prior research has found a relationship between low self-control and drug use (Longshore, Chang, Hsieh, & Messina, 2004), drunk driving (Keane, Maxim, & Teevan, 1993), a variety of classroom deviances such as skipping class and cheating (Cochran, Wood, Sellers, Wilkerson, & Chamblin, 1998; Gibbs & Giever, 1995), and risky sexual behavior (Jones & Quisenberry, 2004). Pornography use may be considered more appropriately an analogous deviant behavior that is better explained by another conceptual model. This is a topic for future research.

The exploration of Internet deviance and crime require the methodical application of hypothesis testing through data collection and analysis. Binik (2001) observed that the social scientific study of sexuality and the Internet has been plagued by “lots of hyp(otheses) – only a little data” (p. 281). Noting that little research has been done on cybersex, Binik proposed at least a decade of research to more empirically inform the understanding of how and why individuals use the Internet for constructing aspects of their sexual experience. While media reports about online deviance and the suggested perils of cybersex abound, more work needs to be done grounded in an empirical understanding of these phenomena.

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