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Explaining Deviant Peer Associations: An Examination of Low Self-Control, Ethical Predispositions, Definitions, and Digital Piracy

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Abstract: *Digital piracy is an emerging criminal behavior. Criminological research has been successful in explaining intentions to commit digital piracy using several different theories. Social learning and self-control have been two of the theories that have consistently been able to explain digital piracy. Importantly, differential association has been shown to be an invaluable measure in predicting involvement in digital piracy and other crimes. However, no study to date has attempted to show what variables specifically contribute to associations with digital pirating peers. Regression models are used to examine this question and results offer interesting interpretations. Age, sex, low self-control, and ethical predispositions were shown to be associated with digital pirating associations. However, when definitions were incorporated into the model these effects disappeared. The results of the present study advance our understanding of digital piracy and social learning theory and pave the road for research on other types of criminal behavior.*

Keywords: peers; differential association; social learning theory; digital piracy

Digital piracy is an emerging computer-related crime in the twenty-first century. Digital piracy is the unauthorized copying of digital goods--software, digital documents, digital audio (music and voice), and digital video--for any reason, other than to back-up, without permission from and compensation to the copyright holder (Gopal, Sanders, Bhattacharjee, Agrawal, and Wagner 2004). Two forms of digital piracy involve software and music (International Federation of Phonographic Industries [IFPI] 2006). It has been estimated that 37 percent of all music CDs purchased worldwide are pirated, resulting in a 4.5 billion dollar loss to the music industry (IFPI 2006). Additionally, around 20 billion individual song tracks were illegally uploaded or downloaded in 2005 (IFPI 2006). The economic impact of music piracy has been described as "the greatest threat facing the music industry today" (Chiou, Huang, and Lee 2005:161). In the context of software piracy, this behavior has been shown to account for the loss of software sales, jobs, wages, and tax revenue (Business Software Alliance 2003; Peace, Galletta, and Thong 2003; Seale, Polakowski, and Schneider 1998). The Business Software Alliance (2003) estimates that software piracy causes 13 billion dollars in lost revenue to the software industry annually.

Digital piracy is considered a copyright violation and was made a criminal offense by *The Piracy and*

Counterfeiting Amendments Act. The distribution of copyrighted materials via the internet was defined as a felony by *The No Electronic Theft Act* (Koen and Im 1997). While the illegality of digital piracy is clear, the criminal act continues to be performed. The heavy reliance on and use of the personal computer in today's society has allowed digital piracy to exist fairly easily. Wall (2006) argues that the Internet facilitates digital piracy because it allows for anonymity, it bridges transnational gaps, it creates the impression of ownership of ideas rather than property, it is relatively easy, and it allows the offense to take place detached from the copyright holder, thereby creating a sense of a victimless crime. Further, with many modus operandi available to commit digital piracy (e.g., CD burning, peer-to-peer networks, LAN file sharing, digital stream ripping, and mobile piracy [see IFPI.org for a discussion of these techniques]), legal battles and public awareness campaigns have been shown to be "insufficient to gain widespread public compliance with the law" (Tyler 1996:224).

Rather than using valuable resources on interventions that do not seem to work, it may be advantageous to examine the factors believed to influence individuals to commit digital piracy (Al-Rafee and Cronan 2006). Accordingly, the criminological literature has focused on examining such ideas as individual propensities (Higgins

2005; Higgins, Fell, and Wilson 2006; Higgins and Makin 2004a, 2004b; Higgins, Wilson, and Fell 2005; Wolfe, Higgins, and Marcum in-press), behavioral intentions (d'Astous, Colbert, and Montpetit 2005; Gopal et al. 2004), past behavior (Higgins and Makin 2004a, 2004b; Higgins et al. 2005; Wolfe et al. in-press), deterrence measures (Higgins 2005; Liang and Yan 2005; Wagner and Sanders 2001; Wolfe et al. in-press), and ethical beliefs (Al-Rafee and Cronan 2006; Gupta, Gould, and Pola 2004; Moores and Chang 2006; Kini, Ramakrishna, and Vijayaraman 2004; Siegfried 2004; Tan 2002; Taylor 2004; Wagner and Sanders 2001) in explaining digital piracy. Additional research has considered the role of social learning variables as predictors of digital piracy (Higgins, Fell, and Wilson 2007; Higgins et al. 2006; Higgins and Makin 2004a; Higgins and Wilson 2006; Hollinger 1993; Wolfe et al. in-press). Much of this literature has shown that deviant peer associations are positively related to digital piracy. However, no known research has examined what variables are associated directly with deviant peer associations. Thus, the present study will explore possible predictor variables associated with the deviant peer associations (i.e., the dependent variable). Specifically, this study will determine which variables help explain digital pirating peer associations.

Because the internet provides a cloak of anonymity, individuals may be likely to befriend people who they would not normally befriend. That is, the anonymity of the internet provides individuals with an opportunity to behave in ways that they would not normally engage in during face-to-face encounters. For instance, peer-to-peer (P2P) file sharing networks are important in the promulgation of digital piracy. The Business Software Alliance (BSA) (2003) reported that the increased availability of pirated software over the internet via P2P networks is contributing to rising piracy rates. The BSA indicated that almost 60 percent of all internet traffic is driven by P2P networks. Thus, the roles of peers and their networking systems are important in the development and continuation of digital piracy. However, little is known about the development of digital pirating peer associations. This knowledge may provide information to others about P2P networks and their relation to the tendency to perform the behavior. Therefore, a gap exists in the literature for understanding digital piracy peer associations.

The present study will explore the possible predictor variables associated with deviant peer associations (i.e., the dependent variable). Specifically, this study will determine what variables help explain digital pirating peer associations. This study contributes to the literature in two ways. First, this study will advance our understanding of social learning theory. Specifically, it will address areas that explain deviant peer associations. This theoretical development will be valuable in future explorations of other deviant and criminal behaviors and will assist in the formation of policies directed at the reduction of such behaviors. Second, it will help to further explain the act of digital piracy. The present study will shed light on what

contributes to the formation of digital pirating peer associations, which will allow for policy interventions that can help reduce instances of digital piracy.

To make these contributions, the present study will begin with a discussion of social learning theory. It will then address peer associations and definitions in the context of digital piracy, which will be followed by a discussion of self-control theory and ethical beliefs, two concepts that may play a role in explaining deviant peer associations. The methods utilized in the present study will then be discussed, followed by a presentation of the results. The study will conclude with a discussion section.

Social Learning Theory

Sutherland's (1947) theory of differential association has been an influential and widely tested explanation of criminal and deviant behavior (Durkin, Wolfe, and Clark 2005). Researchers, however, have criticized the theory's testability (Burgess and Akers 1966; Glaser 1956; Krohn, Skinner, Massey, and Akers 1985). The most complete and most tested revision is Akers's (1985, 1998) social learning theory.

Akers's (1998) social learning theory argues that, like all behavior, criminal behavior is learned. The theory explains criminal and deviant behavior through variables that both motivate or control criminal behavior and that promote or undermine conformity (Akers and Sellers 2004). Akers's social learning theory (1998) posits four concepts essential to the learning process of deviant or conforming attitudes and behaviors: differential association, definitions, differential reinforcement, and imitation.

Differential association. Differential association involves the direct association with individuals who may engage in certain forms of conduct that will result in exposure to specific sets of values and norms (Durkin et al. 2005). The most important associations involved in the learning process are those of peer groups such as family and friends (Akers 1998). Peer associations form the social contexts in which social learning operates. Peer groups provide an individual with definitions, models for imitation, and differential reinforcement for criminal and conforming behavior (Akers 1998).

Definitions. Definitions are the attitudes and beliefs an individual attaches to a behavior (Akers 1998). These definitions identify the commission of an act as favorable or unfavorable, desirable or undesirable (Akers 1998). According to Akers (1998), individuals with definitions favorable to the commission of criminal behavior are more likely to engage in such acts.

Differential reinforcement. Differential reinforcement "refers to the balance of anticipated or actual rewards and punishments that follow or are consequences of behavior" (Akers and Sellers 2004:87). Differential reinforcers determine whether the behavior will continue in the future and can be social or nonsocial (Akers 1998). Social reinforcers include the praise, acceptance, scorn, and ridicule of friends or family members, while nonsocial

reinforcers include the psychological and physical effects of drugs or alcohol (Durkin et. al. 2005). Akers (1998) argues that a person will be more likely to commit an act in the future if he or she is rewarded for the act (positive reinforcement) or is able to avoid an unpleasant feeling by its commission (negative reinforcement).

Imitation. Imitation refers to the commission of an act after observation of similar behavior by others (Akers 1998). Whether or not the behavior modeled by others will be imitated is affected by the characteristics of the models, the behavior observed, and the observed consequences of the behavior (Bandura 1977, cited in Akers and Sellers 2004).

Social learning theory has been subjected to a vast number of empirical tests and has received tremendous support (Akers and Sellers 2004; Durkin et. al. 2005; Gottfredson and Hirschi 1990). Akers and Sellers (2004) state that results from the literature show a relationship between social learning variables and criminal behavior that is “typically strong to moderate, and there has been very little negative evidence reported” (p. 92).

Although Akers (1998) social learning theory added much to Sutherland's (1947) differential association theory, much of the current criminological literature consistently demonstrates that deviant peer association is one of the most important elements from the theory for explaining criminal behavior. The element has been shown to explain a diverse array of criminal behavior such as college students' use of fraudulent identification to obtain alcohol (Durkin, Wolfe, and Phillips 1996) and gang membership among high school students (Brownfield 2003).

Differential Association and Digital Piracy

Research has shown peer associations (i.e., differential association) from social learning theory to be one of the strongest predictors of digital piracy (Hinduja 2006; Higgins et al. 2007; Higgins et al. 2006; Higgins and Makin 2004a; Higgins and Wilson 2006; Hollinger 1993; Skinner and Fream 1997; Wolfe et al. in-press). Specifically, Higgins and Wilson (2006) used a sample of 318 college students to demonstrate a positive link between pirating peer associations and software piracy. Higgins et al. (2007) examined movie piracy in a sample of 338 college students and showed that association with movie pirating peers had a positive association with intentions to pirate movies.

The literature on digital piracy and differential association has contributed several important findings to the extant body of knowledge. First, the literature shows how concepts from the theory, such as peer associations, are related to digital piracy. Also, a few studies demonstrate that there are interaction effects that take place between social learning variables and individual propensities (i.e., self-control) (Higgins 2005; Higgins et al. 2007; Higgins et al. 2006; Higgins and Makin 2004a, 2004b; Higgins and Wilson 2006). However, no known study has explicitly used differential association as the

dependent variable in explaining the factors that develop deviant peer relationships.

Definitions and Digital Piracy

The digital piracy literature has demonstrated an association between definitions and intentions to pirate (Higgins et al. 2007; Higgins and Wilson 2006). Higgins et al. (2007) used a sample of 338 college students to show that “associating with movie-pirating peers created an environment that may develop positive movie piracy attitudes” (p. 351). Additionally, the study showed that the link between low self-control and intentions to pirate were exacerbated by positive attitudes (i.e., definitions) for piracy (see also Higgins and Makin 2004a). Similarly, Higgins and Wilson (2006), using a college student sample of 318, demonstrated that favorable definitions for piracy were significantly associated with intentions to pirate. The literature examining the link between definitions from social learning theory and digital piracy has provided support for such a connection. However, no known study has explicitly tested whether or not a measure such as definitions plays a role in explaining variations in differential association. Thus, a gap is left in the literature as to what role an individual's definitions (i.e., attitudes) play in explaining association with deviant peers.

Self-Control Theory

Gottfredson and Hirschi's (1990) self-control theory has received tremendous support in the empirical literature (Pratt and Cullen 2000). The theory posits that poor or ineffective parenting results in a child with low levels of self-control. Poor and ineffective parenting is characterized by a parent's inability to develop emotional bonds with their child, to adequately supervise or monitor his or her behavior, to analyze this behavior for deviance, or to effectively use noncorporal means to punish deviant behavior. Hirschi (2004:543) defines self-control as “the tendency to consider the full range of potential costs of a particular act.” Individuals with low self-control tend to be impulsive and self-centered; to enjoy simple, easy, and physical acts; and to prefer risky behavior. Because criminal behaviors share common characteristics, those with low self-control are more likely than individuals with higher levels to engage in them. Higgins et al. (2007:342) note that “crimes provide a short-lived payoff, an act that requires little planning, an act that is exciting, and one that is simple and easy to perform.” Low self-control has been argued to inhibit an individual's ability to accurately calculate the consequences of crime (Higgins et al. 2007). This inability to see the consequences of committing crime has been shown to be a relatively stable trait throughout an individual's life (Turner and Piquero 2002). Low self-control has been shown to be associated with many forms of deviance and criminal behavior, such as cutting class (Gibbs and Giever 1995), academic dishonesty (Bichler-Roberston, Potchak, and Tibbetts 2003; Cochran, Wood, Sellers, Wilkerson, and Chamlin 1998; Gibbs, Giever, and Martin 1998; Tibbetts and Myers

1999), and theft (Piquero and Tibbetts 1996; Tibbetts 1997; Tibbetts and Herz 1996). As such, it appears logical to examine the link between low self-control and involvement in digital piracy.

Low Self-Control and Digital Piracy

Importantly, research has shown that individuals with low self-control have greater intentions to commit digital piracy. Higgins et al. (2007) used a sample of college students to show that lower levels of self-control were associated with higher intentions to pirate movies. Higgins and Makin (2004a, 2004b), in a sample of college students, demonstrated similar findings with intentions to pirate software. Other research has also shown a positive link between low self-control and digital piracy (Higgins 2005; Higgins et al. 2006; Higgins et al. 2005; Higgins and Wilson 2006; Wolfe et al. in-press). It appears that low self-control is an important predictor variable to be used in studies of digital piracy.

Important to the present study, some researchers have suggested that self-control theory and social learning theory are interrelated in complex ways (Evans, Cullen, Burton, Dunaway, and Benson 1997; Pratt and Cullen 2000; Winfree and Bernat 1998). Higgins et al. (2007) showed through a conditioning analysis that “when substantial association with movie pirating peers and positive attitudes toward software piracy combine, low self-control has its strongest relative impact on movie piracy likelihood” (p. 352). This finding supported the contentions made by Higgins and Makin (2004a) that low self-control is conditioned by social learning theory. It was argued that the “results indicate that individuals develop the intentions to pirate a movie as a member of a group, and the group norms toward movie piracy exacerbate the link between low self-control and intentions to pirate movies” (Higgins et al. 2007:353). However, this is counter to Gottfredson and Hirschi’s (1987) contention that “people acquire the propensity to delinquency, find delinquent friends, and commit delinquent acts” (p. 597).

In order to move beyond previous research and examine Gottfredson and Hirschi’s (1987) argument, the present study will use differential association as the dependent variable. Previous literature has neglected to examine this link in the context of digital piracy. As such, there is a substantial gap left in the literature. Researchers know how self-control and digital piracy are linked and that self-control may be conditioned by social learning theory. However, these studies have all used intentions to pirate as the dependent variable. Using differential association from social learning theory as the dependent variable will show what factors are associated with deviant peer associations rather than simply using it as a predictor of criminal behavior.

Ethical Beliefs and Digital Piracy

Several studies have demonstrated that individuals do not see piracy as a crime or an unethical issue (Im and Van Epps 1991; Solomon and O’Brien 1990). This is an

important finding, since strategies aimed at reducing digital piracy take for granted the illegality of the act. Individuals may not see the act of piracy as illegal or unethical and, therefore, will be influenced little by preventive strategies (Al-Rafee and Cronan 2006). Thong and Yap (1998) used ethical decision-making theory (Hunt and Vitell 1986) to show that individuals are influenced by deontological and teleological evaluations, both of which influence an individual’s piracy involvement. Viewing digital piracy as an ethical behavior appears to be a strong predictor of a person’s intentions to pirate and actual piracy behavior.

Similar to ethical beliefs, several studies have shown that moral beliefs have a connection with digital piracy (Higgins and Makin 2004b; Higgins and Wilson 2006). As an individual’s level of moral beliefs increases, his or her involvement with or intention to digitally pirate decreases. Additionally, in an important study by Gopal et al. (2004), a behavioral model was tested for explaining music piracy. Among other variables, ethical predispositions, or what the authors referred to as “justice,” had strong connections with music piracy involvement. The authors pointed out that due to strong factor loadings in the ethical predisposition scale, such a measure would be beneficial to use in future research on digital piracy (Gopal et al. 2004).

THE PRESENT STUDY

The purpose of the present study is to examine the factors that contribute to the development of associations with digital pirating peers. Much of the extant literature has shown that differential association (Hinduja 2006; Higgins et al. 2007; Higgins et al. 2006; Higgins and Makin 2004a; Higgins and Wilson 2006; Hollinger 1993; Skinner and Fream 1997; Wolfe et al. in-press), definitions (Higgins et al. 2007; Higgins and Wilson 2006), ethical and moral beliefs (Al-Rafee and Cronan 2006; Gopal et al. 2004; Higgins and Makin 2004; Higgins and Wilson 2006; Im and Van Epps 1991; Solomon and O’Brien 1990; Thong and Yap 1998), and self-control all have links with digital piracy behavior. Additionally, many of these studies have shown correlations and interactive effects between each of the variables. However, little research has examined whether such variables explain associating with deviant, software-pirating peers. Regression will be used in the present study to determine whether low self-control, ethical predispositions (Gopal et al. 2004), definitions, gender, or age have a link with differential association.

This study is important to the development and understanding of differential association from social learning theory (Akers 1985), self-control theory (Gottfredson and Hirschi 1990), and ethical predispositions (Gopal et al. 2004) in the context of digital piracy. Additionally, this study will provide information on the factors that are associated with deviant peer associations, which can then be used to implement policies aimed at reducing instances of digital piracy. Finally, results from the present study will guide future research on digital piracy and other forms of criminal behavior.

METHODS

The methods section of the paper will discuss the sampling procedure, sample, measures, and analytic process used in the analysis.

Procedure and Sample

A self-report questionnaire was administered to college students at an eastern university in the United States in the fall 2004 semester after Institutional Review Board and Human Subject Protection review. Prior to administration of the survey, the researchers stressed the voluntary nature of study and explained that answers would be anonymous and confidential. The researchers ensured anonymity by requiring no identifying marks or personal information on the survey instrument. Further, confidentiality was ensured by the researchers storing all completed surveys in a locked filing cabinet housed in a locked room within the researchers' academic building. This set of procedures produced 392 questionnaires. However, due to listwise deletion for missing data, 337 completed questionnaires remained for the analysis. The sample consisted of a non-random sample of students in seven classes from the College of Arts and Sciences. These

classes consisted of general education courses open to all students.¹

Table 1 presents the demographic characteristics of the sample. Males represented 39.2 percent of the sample, which is somewhat unrepresentative of the overall student population, which consisted of 47.4 percent males. About 81.5 percent of the sample was white, which is slightly higher than the university population, which is 76.7 percent white. The mean age category of the student sample was 4.37, which is between the ages of 21 and 22. Age information was not available from the university to compare to this sample. The sample consisted of 9.5 percent freshmen, 33.1 percent sophomores, 21.8 percent juniors, and 35.6 percent seniors. This is compared to the university population from which the sample was drawn, which consisted of 27.4 percent freshmen, 18.9 percent sophomores, 19.7 percent juniors, and 25.1 percent seniors. Thus, the sample is somewhat less representative of the overall university population in terms of class rank. Lastly, the present study oversampled criminal justice majors at 52.0 percent of the sample. While the sample is not perfectly representative of the university population from which it was drawn, it contains few drastic departures in terms of demographic characteristics.

Table 1. Sample Descriptive Statistics

Variable	Valid N	Mean	Median	Std. Deviation	Variance	Skewness	Kurtosis	Minimum	Maximum
Sex	390	.392	0	.489	.239	.443	-1.813	0	1
Race	379	.815	1	.389	.151	-1.632	.665	0	1
Age	391	4.371	4	2.274	5.172	.742	-.320	1	9
Class Rank	390	2.836	3	1.021	1.042	-.206	-1.249	1	4
Major	392	.520	1	.500	.250	-.082	-2.004	0	1

Measures

The measures for this study included differential association (pirating peers), low self-control, ethical predispositions, and the control variables of age (1= 18 to 9= Over 25), sex (1=male, 0=female), race (1= white, 0= non-white), and previous software piracy ("How many times in the past month have you pirated software?").

Differential association. The dependent measure for this study was differential association. A composite of six items from Krohn et al. (1985) was used to form the measure of association with software-pirating peers. The items asked respondents to answer the following questions: "How many of your best *male* friends copied software in the last 12 months without paying for it?," "How many of your *male* friends that you have known the longest have copied software without paying for it in the last 12 months?," "How many of your *male* friends whom you are around the most copied software in the last 12 months without paying for it?," "How many of your best *female* friends copied software in the last 12 months without paying for it?," "How many of your *female* friends that

you have known the longest have copied software without paying for it in the last 12 months?," and "How many of your *female* friends whom you are around the most copied software in the last 12 months without paying for it?" The answers were gathered using a five-point Likert-type scale (1=none, 2= just a few, 3=about half, 4=more than half, and 5=all or almost all). Higher composite scores indicated more association with deviant peers or differential association. Internal consistency was shown to be acceptable for this measure ($\alpha = .96$). Further, factor analysis and scree test showed that the scale was unidimensional.

Definitions. Respondents' definitions were measured using a set of 11 questions regarding their attitudes toward illegally copying or downloading digital software. A list of the items used in the definitions scale is presented in the Appendix. Such questions are consistent with Akers (1998) but have been formulated to be offense specific. A four-point Likert-type scale, ranging from 1=strongly disagree to 4=strongly agree, was used to measure each of the questions. A definitions scale was created by summing

the ten questions together. Internal consistency for the scale was acceptable ($\alpha = .92$) and was demonstrated to be unidimensional through factor analysis and scree test. Higher scores on the scale indicated positive definitions in favor of piracy.

Low self-control. Respondents' level of self-control was measured utilizing the 24-item Grasmick, Tittle, Bursik, and Arneklev (1993) scale. Response answer choices were measured on a four-point Likert-type scale, ranging from 1=strongly disagree to 4=strongly agree. The scale had an acceptable internal consistency ($\alpha = .86$) and was shown to be unidimensional through factor analysis and scree test. Higher scores on the scale indicated lower levels of self-control.

Ethical predisposition. Overall ethical predispositions were measured using a composite of four items from Gopal et al. (2004), who demonstrated the utility of such a scale in research on digital piracy. The items asked the respondents to respond to the following statements: all individuals deserve equal treatment before the law; man's capacity for justice makes democracy possible, but man's inclination to injustice makes democracy necessary; to no man will we sell, or deny, or delay right or justice; and all human beings are born free and equal in dignity and rights. Answer choices were captured using a four-point Likert-type scale, ranging from 1=strongly disagree to 4=strongly agree. There was acceptable internal consistency ($\alpha = .72$), and factor analysis and scree test show unidimensionality.

Analytic Process

The present study will first examine bivariate correlations. Regression will be used to examine the relationships among the variables and the dependent measure. Two regression models will be run in the present study. The first model will be without the definitions

measure. This will be done to determine the association of the other measures with differential association without the impact of another social learning measure. The second regression will include definitions within the model to determine what impact it has in explaining differential association and if it takes away the effects of the other variables.

RESULTS

Table 2 presents the bivariate correlations for the measures used in the present study. The first issue that can be addressed from this table is multicollinearity. The correlations do not indicate that multicollinearity is a problem with this data. Low self-control was significantly related to age ($r = -.105$), sex ($r = .243$), race ($r = .154$), ethical predispositions ($r = -.147$), and definitions ($r = .231$). This suggests that individuals with lower levels of self-control also have lower ethical predispositions and definitions favorable to software piracy. Also males, younger respondents, and whites tend to have lower self-control. Definitions were also significantly correlated with age ($r = -.176$), previous piracy ($r = .208$), and ethical predispositions ($r = .121$). These results suggest that younger individuals, those who have pirated software in the previous month, and those with ethical predispositions were more likely to have definitions favorable to software piracy. Differential association was shown to be significantly correlated with all other variables except race. That is, individuals with low self-control ($r = .205$) were more likely to have deviant peer associations (i.e., software pirating peers), and males ($r = .131$) and younger respondents ($r = -.219$) were more likely to have deviant peer associations. Further, those who had definitions favorable to the commission of software piracy were more

Table 2. Bivariate Pearson Correlations of Measures (n=337)

Variables	1	2	3	4	5	6	7	8
1. Age	1							
2. Sex	.168**	1						
3. Race	-.126*	.060	1					
4. Previous Piracy	-.070	.066	.036	1				
5. Low Self-Control	-.105*	.243**	.154**	.106*	1			
6. Ethical Predis.	-.036	.080	.067	.028	-.147**	1		
7. Definitions	-.176**	.087	.083	.208**	.231**	.121*	1	
8. Diff. Association	-.219**	.131*	.035	.308**	.205**	.113*	.376**	1

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

likely to associate with peers who pirate ($r = .376$). An interesting finding was that ethical predispositions ($r = .131$) were positively related to differential association.

This is a finding that appears to be counter to previous literature and warrants further investigation. Pearson correlation was used to determine whether or not the

measures were related enough to warrant a regression analysis. The next step in the research process is to perform a regression analysis to determine the relative impact that each measure has on software pirating peer association.

Ordinary least squares (OLS) regression was used in the present study because the data were appropriate for such a technique. Specifically, the data are approximately normally distributed, which allows for the use of OLS regression. Table 3 summarizes the first regression analysis (i.e., without definitions in the model) to

determine what factors are associated with deviant peer associations. Low self-control has an impact on differential association ($b = .074$, $B = .130$, $t = 2.302$). The lower an individual's self-control level, the greater deviant peer associations tend to be. This finding is consistent with literature concerning self-control theory and digital piracy. Further, the regression demonstrates that age is significantly related to deviant peer associations ($b = -.331$, $B = -.161$, $t = -2.927$). Specifically, as age increases, individuals are less likely to associate with digital pirating peers.

Table 3. Regression Results with Differential Association as the Dependent Variable ($n=337$)

Variables	Unstandardized Coefficients		Standardized Coefficients		t	Sig.	Collinearity Statistics	
	b	Std. Error	Beta				Tolerance	VIF
Age	-.331	.113	-.161		-2.927	.004	.902	1.109
Sex	.877	.544	.091		1.610	.108	.853	1.172
Race	-.613	.633	-.051		-.968	.334	.969	1.032
Previous Piracy	.217	.046	.248		4.670	.000	.964	1.037
Low Self-Control	.074	.032	.130		2.302	.022	.850	1.176
Ethical Predis.	.291	.140	.111		2.074	.039	.953	1.049

F = 8.935**
R² = .146
** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

A unique finding from the first regression model is that ethical predispositions are associated with differential association in the opposite direction from what previous literature (Gopal et al. 2004) would suggest ($b = .291$, $B = .111$, $t = 2.074$). According to the regression, individuals with stronger ethical predispositions have more association with deviant peers. This is an important and interesting finding, given previous literature that implicates strong ethical predispositions (Gopal et al. 2004) with having a deterrent effect on digital piracy. The results of the present study suggest that strong ethical predispositions do not hinder the formation of deviant peer associations and may, in fact, lead to more encounters with software pirating friends. An examination of the tolerance and VIF values in the first model indicates that multicollinearity is not a problem with the data.

The next step in the present study was to examine the impact of definitions on the first model. Table 4 summarizes the findings for the second regression with definitions in the model. The results of the second regression are different from those in the first. With definitions in the model, the effect of low self-control and ethical predispositions on differential association was taken away. Age ($b = -.283$, $B = -.138$, $t = -2.538$) was still shown to impact differential association, with older respondents experiencing less association with deviant peers. Additionally, previous software piracy ($b = .171$, $B = .197$, $t = 3.709$) was still a significant predictor of differential association. Further, results from this regression demonstrate that individuals with favorable definitions for software piracy had significantly more associations with pirating peers ($b = .205$, $B = .258$, $t = 4.753$).

Table 4. Regression Results with Definitions included in Model and Differential Association as the Dependent Variable ($n=337$)

Variables	Unstandardized	Standardized		t	Sig.	Collinearity Statistics	
	Coefficients b	Std. Error	Beta			Tolerance	VIF
Age	-.283	.112	-.138	-2.538	.012	.887	1.127
Sex	.669	.541	.069	1.236	.217	.839	1.192
Race	-.295	.630	-.024	-.468	.640	.963	1.038
Previous Piracy	.171	.046	.197	3.709	.000	.936	1.068
Low Self-Control	.045	.032	.078	1.376	.170	.809	1.236
Ethical Predis.	.204	.139	.078	1.471	.142	.930	1.075
Definitions	.205	.043	.258	4.753	.000	.893	1.120

F = 10.853**
R² = .200
** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

DISCUSSION

The purpose of the present study was to determine what variables explain associating with software pirating peers by using differential association from social learning theory (Akers, 1985) as the dependent variable. Software piracy has been shown to be a serious crime problem in the United States (Business Software Alliance 2003; Peace et al. 2003; Seale et al. 1998). A number of criminological studies have examined digital piracy using social learning theory (Hinduja 2006; Higgins et al. 2007; Higgins et al. 2006; Higgins and Makin 2004a; Higgins and Wilson 2006; Hollinger 1993; Skinner and Fream 1997; Wolfe et al. in-press), self-control theory (Higgins 2005; Higgins et al. 2006; Higgins et al. 2005; Higgins and Wilson 2006; Wolfe et al. in-press), and ethical predispositions (Al-Rafee and Cronan 2006; Gopal et al. 2004; Higgins and Makin 2004b; Higgins and Wilson 2006; Im and Van Epps 1991; Solomon and O'Brien 1990; Thong and Yap 1998). However, no study to date has attempted to explicitly explain digital pirating peer associations. Doing so is important for two reasons. First, explaining digital pirating peer associations will assist in the formulation of policies aimed at reducing digital piracy. Secondly, understanding digital pirating peer associations will advance our understanding of social learning theory and will improve its utility in explaining various types of criminal behavior.

Results from the present study come with the use of two regression models. The first model examines the ability of age, sex, race, previous piracy behavior, low self-control, and ethical predispositions in explaining deviant peer association. This model does not include any social learning measures except the dependent variable of differential association. The results indicate that as an individual's age increases, he or she tends to associate with fewer deviant peers. Previous research on digital piracy

has not found any significant associations with age and digital piracy (Higgins et al. 2007; Higgins and Wilson 2006). However, these studies did not use differential association as the dependent variable. While age may not help explain intentions to digitally pirate, the present study contributes to the literature by showing that age is an important predictor of association with pirating peers. Additionally, previous piracy behavior was shown to influence differential association. Specifically, those individuals who engage in more software piracy have more friends who engage in the same behavior. This is a fairly consistent finding in the social learning and digital piracy literature. These findings suggest that the robustness of social learning theory may be mediating the effect of demographics. Further, the first regression model demonstrates that low self-control is associated with deviant peer association, which tends to be a similar finding to previous literature showing low self-control to be a predictor of intentions to pirate (Higgins 2005; Higgins et al. 2006; Higgins et al. 2005; Higgins and Wilson 2006; Wolfe et al. in-press). The finding from the present study shows that an individual's level of self-control can not only be used to predict his or her intention to pirate but also to predict his or her association with deviant pirating peers. However, the relative impact of low self-control on deviant peer associations may not be as strong as Gottfredson and Hirschi (1990) contend in their general theory of crime when other variables are taken into consideration.

A unique finding from the first regression was that ethical predispositions were positively related to deviant peer association. This finding is counter to what would be hypothesized after examining previous literature on the subject. Studies have shown that individuals with lower ethical predispositions are more likely to commit digital

piracy (Gopal et al. 2004; Higgins and Makin 2004b; Higgins and Wilson 2006). As such, one would believe that lower ethical predispositions would be associated with more deviant peer relationships. However, the present study contributes to the literature by demonstrating that this is not the case. Rather, the more ethical an individual is the more likely she or he is to have deviant peer relationships. This suggests that ethical predispositions may not be important in reducing peoples' association with software pirating peers. Further, this finding suggests that software piracy may be a behavior that is often socially accepted and thus accepted within many peer groups. Essentially, associating with peers who commit software piracy may not be viewed as an unethical behavior.

Important to the present study was the second regression that included definitions from social learning theory in the model. This measure was included to see what effect it had on the other variables in the model. Interestingly, definitions took away the effect of low self-control and ethical predispositions. With definitions taken into consideration, an individual's level of self-control or ethical predispositions did not have an impact on his or her deviant peer associations. While the second regression still demonstrates that older individuals associate with fewer deviant pirating peers and those who have pirated themselves associate with more deviant peers, definitions was the only other measure with a significant relationship to the dependent variable. Specifically, individuals who have definitions that favor digital piracy are more likely to associate with peers who engage in the behavior. This finding is important to both the digital piracy and social learning theory literature. Importantly, the present study shows that when definitions are included into the model, the effect of low self-control and ethical predispositions on differential association is reduced to insignificance. It appears that definitions have such a strong effect in explaining association with deviant peers that the impact of all other variables (with the exception of age) is negligible.

There are several important findings to consider when developing sound policy to thwart software piracy. Research has shown associating with deviant peers to be an important predictor of an individual's involvement in digital piracy (Hinduja 2006; Higgins et al. 2007; Higgins et al. 2006; Higgins and Makin 2004a; Higgins and Wilson 2006; Hollinger 1993; Skinner and Fream 1997; Wolfe et al. in-press). Accordingly, policy aimed at reducing digital piracy should not overlook deviant peer relationships. If digital pirating associations can be reduced, in turn, digital piracy as a behavior can be reduced. Results from the first regression need to be viewed with caution, given the findings in the second regression. The results of the present study demonstrate that in order to reduce contact with deviant peers, policy needs to target people's definitions of whether the behavior is criminal or not. Internet service providers and software companies should post messages both on products and online that remind people that piracy is a crime, explaining why, and

informing of the harm that piracy causes to the economy, people's jobs, and the cost of products. Exposing the public to such messages would hopefully increase the likelihood that they would view piracy as a crime and as inappropriate. They would, as a result, reduce their contact with deviant pirating peers. In effect, these messages are aimed at changing individuals' definitions of piracy. Additionally, these individuals may then spread the word to their friends who engage in digital piracy.

The present study also demonstrates that ethical predispositions and definitions are distinct concepts. Ethical predispositions were positively related to differential association in the first model but not in the second. Internet service providers and software companies should be aware of this finding when developing messages intended to change people's definitions of piracy. The wording of the messages is as important as who receives them. The messages should use language similar to the questions in Appendix 1 asking individuals their definitions of piracy. While research has shown an individual's level of self-control to be fairly stable over time (Turner and Piquero 2002), policies aimed at reducing software piracy should consider the role of self-control in influencing deviant peer associations. While such an action may not change a person's level of self-control, it may assist in restoring inhibitions that were reduced due to previous piracy (Higgins et al. 2007). However, results from the present study show that this may not help in reducing contact with deviant peers. Lastly, policy attempting to reduce instances of digital piracy should focus on younger age groups, since the present study suggests that people age out of associating with pirating peers.

The results of the present study yielded important findings for researchers and policy makers trying to reduce digital piracy. However, the study is not without limitations. For one, the sample was that of college students, which makes generalizability of results difficult. However, social learning theory is considered a general theory that explains all crime all of the time. As such, regardless of the sample, results should be useful in making predictions about larger populations. A second limitation is that the present study used regression as the main analytic tool. This technique demonstrated important results, but the findings cannot be discussed in terms of causal order. Future research would benefit from using larger samples and more advanced statistical techniques.

Despite the limits, the present study contributed significantly to both the digital piracy and social learning theory literature. In particular, the present study was the first to date to use differential association as the dependent variable to help explain deviant pirating associations. Results from the first regression demonstrate the utility of age, sex, and low self-control in explaining deviant peer association. However, when definitions were included in the model, the effect of sex and self-control was diminished. What appear to be the predominant findings of the present study are that younger individuals associate

more regularly with deviant pirating peers and that individuals with strong definitions in favor of piracy tend to associate more with pirating peers. The findings of the present study advance our understanding of social learning theory and digital piracy. The results emphasize the importance of utilizing an overlooked measure, differential association, as the dependent variable. Additionally, the results show that a number of measures have potential in explaining deviant peer relationships with various criminal behaviors. Future studies should investigate other criminal behaviors, use larger and more diverse samples, and employ advanced analytic techniques to more fully capture the behavior and theoretical properties.

Endnotes

¹The seven classes included in this study consisted of four criminal justice classes open to all majors and three general education classes that were required by the university for graduation and that were also open to all majors. Thus, the present study oversampled criminal justice majors.

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Appendix. Items from the Definitions Scale

The following is a list of the items used in the construction of the definitions scale. They can be used in future research or to formulate messages aimed at changes in definitions of piracy.

- 1) I do not think it is okay to use copied software because it may create a negative image (reverse coded).
 - 2) I think copied software helps people, including me, save money.
 - 3) I think it is okay to use copied software to improve my productivity.
 - 4) I see nothing wrong in giving friends copies of my software in order to foster friendship.
 - 5) I think it is okay to use copied software if it improves my knowledge.
 - 6) I think it is okay to use copied software because the community at large is eventually benefited.
 - 7) I believe that copying software helps to increase my computer literacy.
 - 8) I think it is okay to use copied software for entertainment.
 - 9) I see nothing wrong with using copied software if it is badly needed for the success of a project.
 - 10) I think it is okay to use copied software for research purposes, because everybody shares the benefits.
 - 11) I think copying software is okay to punish software publishers who charge high prices.
-