

DOWNLOADING MEDIA FILES: A THEORETICAL APPROACH TO UNDERSTANDING
UNDERGRADUATE DOWNLOADING OF MEDIA FILES

By

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Research into intellectual property theft, especially concerning copyright infringement, has recently become a topic of interest. Many studies focus on the legal or economic side of copyright infringement, with much of this work investigating software piracy and the impact copyright infringement has on the copyright holders. Illegal copying and downloading of copyrighted materials has particularly become an area of interest as the media industry, such as record labels and production studios, begin to fight against copyright infringement. Few studies investigate the phenomena of illegally downloading media files from a theoretical perspective. The purpose of our study was to examine the downloading of digital media files, identify factors associated with the behavior and their theoretical implications. Moreover, our study examined how and why undergraduate students copy and download copyrighted material.

CHAPTER 1 INTRODUCTION

Copyright infringement involves the violation of laws protecting intellectual property, such as a song or movie. This behavior generates a great deal of interest in many fields. In the business and economic arena, for example, copyright infringement, specifically in the form of physical and digital piracy, clearly harms the movie, music, and software industries, costing billions of dollars in lost revenue (Marshall, 2004). The losses in revenue affect a wide spectrum of individuals, from artists in the recording industry all the way to the consumers who must pay higher prices to make up for the losses in royalties. The legal arena becomes involved when criminal or civil action is taken to punish and deter violators. Finally, the academic and research profession becomes involved in studying and trying to explain piracy behavior.

Piracy, in general, is a form of theft. However, there may be a difference between the different forms of piracy. It is possible that physical piracy is more difficult than digital piracy via the Internet or that the various types of piracy are viewed differently by individuals engaging in the behavior. For the purposes of this study, piracy is considered the physical copying of material, such as a software program, while Internet downloading refers to the copying and exchange of digital media (non-physical). In both cases, there is no payment, compensation, or even recognition given to the original creator.

There are a number of approaches currently used to explain piracy behavior in criminology. The two approaches chosen in this study are among the most common and highly supported theories of behavior. In general, piracy behavior can be explained by individual level characteristics or by group influence involving social learning. On the one hand, the behavior may be caused by low self control in an individual; they prefer to act impulsively without considering the implications of their actions. On the other hand, behavior is influenced by

friends. Instead of an individual's characteristics, the perpetrators may have learned the behavior from friends and choose to go along with their friends rather than go against the norms of the group. These two competing paradigms yield very different implications for controlling piracy. Therefore, it is important to study media and software piracy from both of these two theoretical perspectives.

While piracy often involves physical copies of some form of media, the main focus of this project is specifically looking at media files, the Internet, and computer use by college students. The purpose of this study is to discover why there is still so much illegal downloading over the Internet despite the fact that there have been many laws passed to prevent it. Specifically, this study focuses on how two theoretical models - social learning and self control – can explain illegal downloading through two research questions. First, since both self control theory and social learning theory have been used to explain software piracy, can the theories explain illegal downloading? Second, can self control theory alone explain downloading behavior even when controlling for other predictors of digital piracy?

This study will contribute to the literature by expanding research from early software piracy to all types of digital media files. Software piracy, in this study, is considered a physical form of piracy while Internet downloading concerns digital media. It is possible that this is an difference. We will test if social learning and self control theories are generalizable to media downloading and copying.

The following chapters will review the literature on the two theoretical models, namely, social learning and self control, and then discuss copyright infringement and piracy. Next the methods used in this study, sample characteristics, and statistical analyses are covered. This will

then be followed by the section explaining the results. Finally, there is a chapter for the summary of results and conclusion, as well as a section suggesting future research directions.

CHAPTER 2 LITERATURE REVIEW

The following chapter will include a discussion of the extant literature as related to the current study. In order to understand the background for this project, the two theoretical models, namely, social learning and self control, are first described. Then, the evolution of intellectual property and intellectual property law is explained. Finally, previous research into piracy from which the current study was derived is discussed.

Social Learning Theory

Edwin Sutherland proposed in 1947 that criminal behavior is learned through interactions with other people, just like any other behavior is learned. He called this idea differential association theory. During the process of learning behaviors, the individual also learns techniques, attitudes, and motives favorable to that behavior. These attitudes and motives create definitions favorable to that behavior. An individual will commit delinquent acts when there are more definitions favorable to criminal activity than those favorable to lawful activity (Sutherland, 1947).

Sutherland also explained that there could be variations in differential association because of differences in the frequency, priority, duration, and importance of the association. This, in turn, could affect the likelihood of developing pro-crime definitions. For example, an individual would be more likely to develop favorable definitions towards criminal behavior if they were first exposed to the pro-crime definitions, frequently, intensely, and for a long time. If the exposure was to the pro-law definitions in the same manner, then the individual would be more likely to develop pro-law definitions. This theory eventually was modified by other researchers, most notably Burgess and Akers. Arguably the most frequently used and carefully tested is Akers' social learning theory (Akers, 2000).

Expanding from Sutherland's differential association, Burgess and Akers outlined a differential reinforcement theory which utilized the major principles of behaviorism (1966). Akers further developed this differential association – reinforcement theory and proposed his social learning theory. In this theory, criminal behavior was still considered a learned behavior as Sutherland proposed. The difference was, in social learning theory, the behavior was learned through operant conditioning and imitation (Akers, 1985; 1998). By combining the modified differential association ideas with behavioral reinforcement components, Akers argued his was a broader theory that could explain more, yet did not reject differential association (Akers et al., 1979; Akers, 1985; 1998).

The four main concepts in social learning theory are differential association, definitions, differential reinforcement, and imitation (Akers, 1985; 1998). Differential association refers to the way in which an individual is exposed to definitions that are favorable or unfavorable towards criminal and legal behavior. This exposure can be direct, where the individual is interacting with others who engage in behaviors, either criminal or legal. This exposure could also be indirect if the individual identified with a distant group. The strength of the influence is determined by the priority, frequency, duration, and intensity of the exposure. Associations will have greater impact if they occur first, frequently, intensely, and for a longer time (Akers, 1985).

Definitions are both an individual's social and nonsocial attitudes and beliefs about a particular behavior. These can be general, such as ethical, moral, and/or religious values, or specific, values attached to particular behaviors. If an individual possesses attitudes that permit or approve of a certain behavior, the more likely he or she is to engage in that behavior. Therefore, an individual whose attitudes/beliefs disapprove of a behavior will be less likely to engage in the behavior (Akers, 1985).

Differential reinforcement involves anticipated rewards and punishments associated with a behavior. Perceived positive or rewarding outcomes of a behavior (positive reinforcement) will increase the likelihood an individual will engage in the behavior as will the removal of a negative or undesirable outcome (negative reinforcement). Again, there are variations in reinforcement. The greater the amount of reinforcement, the more often it is reinforced, and the higher the chance there is for reinforcement, the more likely the behavior will continue (Akers, 1985).

Imitation or modeling is when an individual engages in a particular behavior by observing that behavior in others and repeating it. Not all behaviors will be modeled by others. It depends upon the type of individual models, the actual behavior being observed, and what are the consequences of the observed behavior (Akers, 1985).

Social learning theory has been criticized because behavioral learning principles appear to be tautological, specifically, because reinforcement is defined as the strengthening of a behavior. This is a problem because, when testing the hypothesis “if a behavior is reinforced, then it is strengthened,” there is no way to prove it false. While this is an issue, it may be possible to address it in research studies. Burgess and Akers acknowledged this problem and suggested that the tautological aspects should be separated from the testable aspects of social learning (1966). Plus, reinforcement variables are separate from behavior measures.

Another critique revolves around the temporal ordering of the variables. The theory assumes that delinquent associations/peers lead to delinquent behavior. It is possible that an individual is first a delinquent individual and then searches for and associates with other delinquents. If this is the case, delinquency causes delinquent associations, not the other way around (Hirschi, 1969; Gottfredson and Hirschi, 1990; Sampson and Laub, 1993). Social learning theory, however, allows for a reciprocal relationship. Delinquents can differentially

associate with other delinquents and learn other definitions favorable to the delinquent behavior, and then the individual increases involvement in the behavior (Akers and Lee, 1996).

Social learning theory has enjoyed considerable support in the literature. Especially strong predictors of behavior are definitions and peers. Akers, Krohn, Lanza-Kaduce, and Radosevich (1979) found support for social learning theory in their study. Differential association was the strongest predictor of deviant behavior, but the other social learning factors – definitions, differential reinforcement, and imitation – were also predictors. This study did find that imitation was the weakest of the four predictors of deviant behavior (Akers, et al., 1979). Krohn, Skinner, Massey, and Akers examined how well social learning theory could explain deviance in teenagers. Specifically, this study investigated whether reinforcement was a necessary aspect of social learning theory, and they concluded that it was. Reinforcement was concluded to be separate from definitions even though reinforcement variables could be considered a form of positive definitions (Krohn, et al., page 468). However, social learning theory does not explain the onset of delinquency and delinquent behavior well.

Lee, Akers, and Borg (2004) found that social learning variables were useful in looking at the effects of social factors, such as age, gender, SES, etc., on delinquency. This study suggested that social learning variables mediated the effect of socioeconomic factors (Lee, Akers, and Borg, 2004: 29). Moreover, social learning variables have been linked to software piracy (Skinner and Fream, 1997; Higgins and Makin, 2004; Higgins, 2005; 2006). Individuals' attitudes towards software piracy have been linked to offending in other studies (Christensen and Eining, 1991; Rahim, Seyal, and Rahman, 2001). These results offer additional support for social learning theory and suggest that social learning variables will be strong predictors of other forms of computer assisted piracy.

Self-Control Theory

Gottfredson and Hirschi's (1990) General Theory of Crime (i.e., self control theory) is a control theory where an individual's control comes from one source – self-control. This theory proposes that all criminal behavior can be explained by an individual's self-control. If an individual has high self-control, they are less likely to engage in criminal or risk taking behavior – regardless of age. If an individual has low self-control, they are more likely to engage in criminal behavior – regardless of age. Circumstances, however, mediate low self-control's effect on behavior. The environment surrounding an individual and the presence or absence of supervision (opportunity) can affect behavior. This is considered criminal propensity. Low self-control is primarily the result of ineffective socialization. Specifically, poor parenting practices can lead to the deficient socialization which results in low self control for the child (Gottfredson and Hirschi, 1990).

Children must be socialized correctly in order develop their self-control. It is the parents' responsibility to ensure this happens by supervising their children, forming attachments, and punishing delinquent behavior. The most important takes place in the family. However, other social institutions contribute as well. Self-control, once formed as a child, remains at relatively the same level as the individual ages (Gottfredson and Hirschi, 1990).

Crimes and other analogous acts (i.e., smoking or sexual promiscuity) can be seen as a way to receive something pleasurable and rewarding. In this definition, crimes are short lived, easy, immediately gratifying, and simple. Crimes are the product of assessing the present opportunity and the strength of pleasure resulting from the act. Individuals with low self-control tend to be impulsive, physical, short-sighted, risk-taking – factors considered to be dimensions of self-control (Gottfredson and Hirschi, 1990).

Self control theory has also been criticized for being tautological because criminal propensity is measured by analogous behaviors which are a part of criminal propensity (Akers, 1991; Akers, 1998). Initial studies used analogous risk taking behaviors such as smoking or drinking as a proxy for low self-control. For example, individuals' past drinking behavior was used as a measure of self-control for predicting drunk-driving arrests (Keane et al, 1999). Self reports of smoking and drinking behavior were used to predict other forms of self-reported delinquency (LaGrange and Silverman, 1999). Grasmick and colleagues (1993) directly tested self control theory. Their measures were based on the various dimensions of self-control. This study found mixed results, but suggested that individual items corresponding to specific dimensions of self control may be better predictors of criminal behavior. Still, the items could be used as measure of self-control.

Overall, self-control theory has been well supported by research. A thorough meta-analysis demonstrated that low self-control had a large effect and was a strong predictor of crime (Pratt and Cullen, 2000). Grasmick and colleagues designed a scale to measure self control and, using factor analysis, concluded that self control was unidimensional and was accurately measured by the scale. However, they also noted that opportunity for criminal activity had a significant main effect on use of force and use financial fraud (Grasmick et. al, 1993).

Moreover, self control has also been used as a predictor of software piracy. Higgins (2005) found that students with low self control were more likely to engage in software piracy, even when controlling for peers, attitudes, and moral beliefs. Low self control also can help reduce the gender gap in software piracy (Higgins 2006). This suggests that low self control could be expanded to include other forms of copyright and intellectual property infringement to see if low self control remains a strong predictor of deviant behavior.

Intellectual Property

Intellectual property, which commonly refers to the legal rights to intellectual pursuits, consists of creative and innovative thoughts from the human mind and the original expression of these thoughts (WIPO, 2001). However, this conception of intellectual property continues to change as new advances in technology offer many new challenges for developing and maintaining legal rights of ownership over ambiguous concepts and ideas. Intellectual property, especially in modern or industrial nations, could be considered “the backbone of economic activity and competitive advantage in the world market place” (Ronkainen and Guerrero-Cusumano, 2001: 59). The World Intellectual Property Organization (WIPO) declares that “intellectual creation is one of the basic prerequisites of all social, economic, and cultural development” (WIPO, 2001:41).

Intellectual property is officially defined by WIPO as any idea or set of ideas that has come from the creative mind of a person or group, as well as the expression of that idea in an original way (WIPO, 2001). Intellectual property is commonly divided into two broad categories – industrial property and copyrights. Rights related to industrial property includes patents (protects inventions), trademarks (identifying marks, such as the Nike swoosh,) and industrial designs (the aesthetics of a product). Commercial names and protection against unfair competition are also included in this division of intellectual property. Industrial property is considered less of an “intellectual creation” and seen more as specific “signs [for] transmitting information to consumers” (WIPO, 2001: 4). Rights involving copyright issues include artistic or literary works, such as music, novels, poems, paintings, plays, and films. Copyrights include physical constructions of ideas, such as a song, a schematic, a scientific breakthrough, or a work of art, as well as nonphysical aspects of creation such as the thought processes, names, or artistic

performances. Ideas, and products from these ideas, are treated as a kind of property, owned by the creator and protected by law (WIPO, 2001).

Intellectual property laws are meant “to give statutory expression to the moral and economic rights of creators in their creations [and]... to promote... creativity and the dissemination and application of its results and to encourage fair trading which would contribute to economic and social development” (WIPO, 2001: 3). Violations of these laws are considered intellectual property crime. While intellectual property crime can involve numerous different types of infringement, the following sections will focus on a specific type of copyright infringement – piracy. While piracy can include the copying and selling of physical objects, such as movie DVD’s, software CD’s, or music CD’s, the pirated media files discussed will be the copying and/or downloading of digital files using a computer via the Internet.

Intellectual Property laws and legislation

Countries have laws to protect intellectual property for two main reasons. One is to give statutory expression to the moral and economic rights of creators in their creations and the rights of the public in access to those creations. The second is to promote, as a deliberate act of Government policy, creativity and the dissemination and application of its results and to encourage fair trading which would contribute to economic and social development (WIPO, 2001: 3).

Intellectual property violations that involve the piracy of music, movies, and software are all considered to be violations of copyright law. Copyright infringement of music has always been a major issue, especially with bootlegging live, unreleased performances. Using audio cassette recorders to make copies of music, such as radio songs, and actual recordings of cassette tapes first brought this issue to attention. The music industry is massive, and there are billions of dollars in revenue at stake. However, as technology advanced, so did the piracy. Movies and software also quickly became pirated materials. Moreover, songs, being smaller files in mp3

format, were easier to transfer because they took up less space and took less time to create and/or download.

Uploading, downloading, and sharing music files became much easier with the advent of MP3 technology, which is a form of file compression that creates a low memory (i.e., smaller sized) music file (Kasaras, 2002). The MP3 format allowed for quicker transfers because of the smaller file size and the nearly universal nature of the formatting of the files. File sharing became a popular way to send and receive songs without paying for the CD or even seeing an actual hard copy of it. This also allowed for individuals to customize their own music CDs with their own music “mixes.” This allowed individuals to select individual songs and not buy the entire album. The new technology also led to advances in the digital sharing of other forms of media. After several legal battles and intensive lobbying, the music industry began to make progress against the legions of internet users savvy enough to operate file sharing programs and manipulate MP3 technology. Several high profile cases against file servers, such as *Recording Industry Association of America v. Napster*, *Metallica v. Napster*, and *Recording Industry Association of America v. Verizon Internet Services*, have pushed copyright violations into general public awareness and brought about advances in copyright protection.

The first Copyright law was enacted in 1897. This act criminalized copyright infringement by requiring the “conduct be willful and undertaken for profit” (Maher and Thompson, 2002: 783). The next major change to copyright law did not occur until the Copyright Act of 1976, which changed the restriction of infringement being for profit. In 1997, the No Electronic Theft (NET) Act was enacted. This criminalized the reproduction of copyrighted material and/or the distribution of such material. The Digital Millennium Copyright Act was enacted in 1998 which affected copyright infringement of online materials (Maher and Thompson, 2002).

Copyright infringement fears led to intensive lobbying as the Recording Industry Association of America (RIAA) aggressively attacked online pirating and file sharing. This powerful supervisory body of the music industry has fought for stricter copyright protection policies and has been involved with the development of several copyright acts, such as the Digital Performance Right in Sound Recording Act in 1995 and the Digital Millennium Copyright Act in 1998 (Imfeld and Ekstrand, 2005).

Historically, interest groups representing copyright holders exerted considerable influence over the legislation corresponding to their industry. Piracy could limit the recording industry by affecting investments, development, and profits. Therefore, protecting copyrights is “in the interests of the governments whose companies are behind this effort as well as the companies whose rewards for this activity are threatened” (Ronkainen and Guerrero-Cusumano, 2001: 59). However, some individuals see the influence of these powerful interest groups as being excessive. The politics of the powerful few took over the original intent to protect the powerless many (Imfeld and Ekstrand, 2005). This is a self-evident trend often seen in lobbying, beginning with the Copyright Act of 1909 and continuing through to the Digital Millennium Copyright Act (DMCA) of 1998.

However, with the advent of the Internet in the 1990s, the various affected industries, specifically the music industry, foresaw the enormous potential harm for copyright violations and infringement issues. This was largely due to the ease in which individuals could upload and share files (specifically small music files) without any reliable means to identify the ISP source, track the movement of the file, or guarantee payment for the use of the file (Imfeld and Ekstrand, 2005). This galvanized interest groups to seek stricter copyright laws that dealt with the new advances in digital file transfer technology.

The Digital Millennium Copyright Act of 1998

The DMCA is one of the pivotal pieces of legislation concerning copyright infringement and the Internet. The act is the result of a report to the Clinton administration that led to a proposal for the National Information Infrastructure Copyright Protection Act of 1995. The initial report by the National Information Infrastructure Task Force (NIITF) evaluated “intellectual property issues within the context of the exploding” Internet (Imfeld and Ekstrand, 2005: 297-298). The NIITF first held a congressional hearing on intellectual property in November of 1993. This led to the July 7, 1994 release of the NIITF’s preliminary report, the “Green Report.”

The Green Report was issued in order to “ensure broad dissemination and ample opportunity for public comment prior to making final recommendations” (NIITF, 1995: 3) concerning the proposed changes related to various intellectual property issues and the Internet. After receiving feedback from citizens, electronic and entertainment industries, academic and legal communities, among others, the Task Force released their second report, the “White Paper,” in October of 1995.

This report addressed many issues involving copyright violations. Exclusive rights were defined as well as the exceptions to exclusive rights such as fair use, the first sale doctrine, and library access. Specifically, the White Paper expressed concerns about how easy it would be to upload copyrighted material and disperse it on the Internet via downloading. “Just one unauthorized uploading of a work onto a bulletin board, for instance -- unlike, perhaps, most single reproductions and distributions in the analog or print environment – could have devastating effects on the market for the work” (NIITF, 1995: 10). It is important to note the date of this publication. The NIITF expressed great concern over uploading material to a bulletin board. This report was published in 1995, before MP3 technology and the advent of file sharing

programs, such as Napster (developed in 1999), which enabled users to upload and download files to a searchable off-site server, much like a database for available digital files. A bulletin board, on the other hand, features an online network that allows postings of information to be shared. The NIITF also suggested that the Internet would never reach its “full potential...if...products protected by intellectual property laws are not protected efficiently when disseminated via the NII [Internet]” (NIITF, 1995: 10).

Extensive research went into online service provider liability as well. The White Paper addressed the necessity for protecting the Internet Service Providers that maintain the infrastructure of the Internet. Online service and content providers are necessary for the Internet to function. Without service providers, there would be no means to access the Internet. Without content providers, there would be nothing to view on the Internet. Both access and content providers are vulnerable to piracy and require some form of protection.

Despite the amount of attention paid to this issue, the “NII Copyright Protection Act of 1995” did not address online service provider’s liability issues (Maher and Thompson, 2002; Imfeld and Ekstrand, 2005). This act generated a lot of debate due to the missing legislation concerning ISPs. After months of heated debate, Congress allowed interest groups to join in on the debate over the proposed act. Online service providers and the content industries (i.e., the entertainment industry) fiercely debated ISP liability. Content industries felt that the current proposal was adequate. Anything else would allow ISPs to hide behind ignorance. The online service providers felt that they would be easy targets for lawsuits if strict liability was allowed. The music industry was especially concerned with allowing limited liability because “if online service providers were granted limited liability, content owners who posted works in cyberspace

would suffer tremendous economic harm because online users could pirate their works without penalty” (Imfeld and Ekstrand, 2005: 304).

Though the music industry remained against limited liability for online service providers, the Digital Millennium Copyright Act of 1998 did expand a provision for protecting ISPs in May of 1998. This provision acknowledged that service providers required protection from liability claims since their servers could be used to host the media files which would allow the provider to be held liable for copyright infringement. On the other hand, content providers needed their actual content (the files and information in them) copyright protected. This additional clause helped create legislation that sought a balance between protecting these two types of providers. This change was important because, without content and service providers to maintain the flow of information, the Internet itself would stagnate or possibly fall apart completely (Imfeld and Ekstrand, 2005).

The DCMA is used to sue individuals for copyright violations and to petition for subpoenas of records from Internet Service Providers (ISPs), especially colleges and universities. Though Congress created legislation protecting online service providers, they also allowed for “new notification and subpoena powers for content providers and takedown requirements for online service providers” (Imfeld and Ekstrand, 2005: 311). In 2003, the RIAA demanded over 1,000 subpoenas from the federal court system to discover the personal information of suspected pirates (Galuszka, 2004). However, individual privacy is protected as well. In *Recording Industry Association of America v Verizon Internet Services*, the courts initially supported the RIAA’s subpoena and ordered the ISP to cooperate by providing personal information about an anonymous user who allegedly downloaded over 600 songs in one day.

In December 2003, the US Court of Appeals for the D.C. Circuit found the subpoenas were not authorized by the DMCA, and the ruling was overturned on appeal because the illegal songs in question were not ever on Verizon's system (Imfeld and Ekstrand, 2005). In order to bring about a subpoena, copyright owners, mainly the recording industry, must file law suits against "John Doe" and ask for subpoenas to discover the identification of the individuals (PEW Memo, January 2004).

Technology and Intellectual Property

Advances in technology have both helped and hurt intellectual property theft. MP3 technology, a file compression protocol, made it much easier to upload, download, and share music files (Kasaras, 2002). File sharing became a popular way to send and receive songs without paying for the CD or even seeing an actual hard copy of it. High speed Internet connections sped up file transfer times (Kasaras, 2002). Compression software has made making relatively high quality copies easily possible. The existence of a "Hacker's Ethic," created by Stephen Levy (1984) to describe the morals and ethics of the hacker philosophy, emphasizes computer use and the freedom of information as well as illustrates the strength and pervasiveness of the Internet subculture (Newman and Clark, 2003).

Digital protection has been utilized as one method to curb pirating and DVDs, CDs, and software. Digital Rights Management refers to encryption technology that is used to prevent piracy. One example of this technology is the activation codes that come with software and are required for products imbedded with anti-piracy keys. Because users are charged for each use, this technology also generates revenue for the company (Gregory, 2006). Bandwidth reductions and bans on certain file sharing programs are other techniques used to prevent piracy. Colleges and universities as well as Internet Service Providers can utilize these techniques Digital Rights

Management was first implemented when the Digital Millennium Copyright Act of 1998 made it illegal to tamper with or attempt to work around anti-piracy protection (Zimmerman, 2006).

Digital Rights Management software can be invasive and dangerous as well. One well known example is the case of Sony Music putting software into some of their CD's. The software would install "rootkits," unbeknownst to the user, onto their personal computer. This software would then run constant checks on the user's computer. This software was not mentioned in any User's Agreement and actually harmed the computers by allowing malicious computer programming, such as viruses and spyware to hide on the machine if they used a similar source name to the software. Sony was sued and removed the "rootkit" software from their products (Rusonovich, 2005). In some ways, technology protection has proven to be both a blessing and a curse to intellectual property.

Intellectual Property Theft

Intellectual property crime can involve numerous different types of infringement. Any violation of intellectual property law can be included under this concept. Because of the ubiquitous nature of intellectual property, it is very difficult to determine how much intellectual property theft occurs.

The amount of intellectual property has grown significantly over the 20th Century. Registered works have increased four to five times the amount at the beginning of the 1900's. Technology, especially the personal computer, has allowed copyrighted material to become more available and easier to access (Luckenbill and Miller, 1998: 94). One way to estimate the prevalence of intellectual property theft is to extrapolate from the increases in the actual number of pieces of intellectual property (Luckenbill and Miller, 1998). This section will focus on one specific type of copyright infringement – piracy.

Just as there are no hard numbers enumerating the prevalence of intellectual property theft, it is also incredibly difficult to determine the monetary losses caused by intellectual property theft. Intellectual property theft has been estimated to cost software companies up to \$17 billion in pirated software (Christensen and Eining, 1991). Other estimates suggest that music piracy has cost the music industry billions in lost revenue, and the global value of pirated music was estimated at \$4.2 billion in 2000 (Marshall, 2004). This is associated with the 31% drop in record sales in 2000 and averages to about 2.6 billion songs downloaded per month (Galuszka, 2004).

The Motion Picture Association estimates that between 1998 and 2002, the industry lost over \$1.2 billion to piracy (MPA, 2003). Maher and Thompson (2002) reported that high technology companies were most frequently targeted in intellectual property theft and that intellectual property theft cost a total of \$300 billion in the United States in 1997. Because of advances in technology, specifically the advances in duplication technology, copyrighted materials seem to be hardest hit by intellectual property theft (Christensen and Eining, 1991).

The majority of the current literature investigating copyright infringement, especially concerning internet implications, revolves around some aspect or implication of the Digital Millennium Copyright Act of 1998. This literature specifically looks at the legal and economic implications, namely with piracy's impact on the music industry and the music industry's impact on legislation. However, society is also impacted by piracy, though there is limited research in this area. Internet behavior changes as the computer savvy become more abundant and influences the use of technology. The culture surrounding piracy also changes as digital piracy becomes more advanced. This may create a specialized philosophy similar to the "Hacker Ethic" (Levy, 1984).

College students make up the largest proportion of illegal downloaders and are also among the most Internet savvy. Individuals find ways around restrictions, often justifying their actions by comparing the small change their petty actions may cost with “the billions pocketed every year by monster entertainment companies whom they consider wallowing in hubris and greed” (Galuszka, 2004: 25).

Economically, music piracy does appear to harm the music industry, costing billions in lost revenue (Marshall, 2004). The losses in revenue affect a wide spectrum of individuals, from those in the industry to consumers who must pay more to make up for the losses. On the other hand, some may disagree with the sole ownership of a song and view music as more of a language that should be freely exchanged. The music piracy debate stems from the conflict between large interest groups representing the music industry and groups supporting individual rights to privacy and the free exchange of information, arguments stemming from the notion of a “Hacker Ethic” (Levy, 1984). However, with the technology advancing quickly, it is difficult for the industry to keep up with the rapidly changing technology. Instead, authorities go after Internet Service Providers (ISPs) under the new Digital Millennium Copyright Act (DCMA) of 1998, which was a result of the music industry’s successful interest group lobbying.

With the advancements in digital technology, individuals in society are aware of the dangers and problematic nature of computer abuse. Incidents with fraud, viruses, and theft were well reported by the media (Dowland, et. al., 1999). However, the largest impact on societal awareness seemed to be from the coverage of the RIAA lawsuits. According to a November-December 2003 nationwide phone survey conducted by the PEW Internet and American Life Project, individuals who admit to downloading music files fell to 14% from 39% in March, when the survey was last conducted (PEW Memo, January 2004).

Interestingly, in a March 2005 poll by PEW, the percentage of those who reported downloading music rose to 22%. Also, 27% of those surveyed reported downloading media files in general, and 19% of these downloaders received files from someone's MP3 player (or iPod.) Almost 28% of downloaders received media files (music and/or video) from an instant messaging program, such as AIM or Yahoo! Messenger, or through their email. In this same survey, 53% of internet users reported holding opinions that the companies who own and operate file-sharing networks should be held responsible for any of the pirating that takes place. Moreover, 57% of those with broadband service believe the government can do little to reduce the amount of illegal music file sharing. Of individuals who reported that they had downloaded music in the past but no longer do so, 33% claim they stopped because of the lawsuits (PEW Memo, March 2005). In summary, though society recognizes that piracy is illegal, many individuals still engage in the activity.

Music piracy is not the only form of piracy influenced by Internet access. Movie and software piracy also exploded with the advent of the Internet. Without effective measures for tracking copyrighted material, it is difficult to gauge the extent of the problem. These forms of piracy negatively impact the economy and create international conflict. International disputes arise when certain nations have less strict intellectual property legislation which allows piracy to breed uncontrollably (such as China). Despite Congress's best efforts towards international regulations, digital piracy remains a major issue. While much research has been done on the legal implications of piracy and the Internet, few studies look at what is going on behind the piracy. Perhaps more information about piracy groups and their networks (and the individuals who make up these groups) could provide better solutions for the piracy problem.

Although the Recording Industry Association of America's lawsuits did seem to slow the illegal downloading music files, the decrease did not last very long. This would suggest that legal action is not the most effective way to curb this problem. Perhaps there are other methods for handling piracy. For example, technological safeguards would make it more difficult to upload files. However, for each advancement in technology that benefits the copyright holder, pirates usually create a tool to break through this protection. It may be possible to change the method of encryption or copyright technology to be safer and more difficult to break. Experimental programs have been developed to offer free and legal music for downloading. These download-for-free programs came from universities that entered into a contract with Napster to provide no cost music – for their current students (Galuszka, 2004). More research is needed, however. The digital piracy problem is expected to get worse before it gets better. This is partly due to the change in television broadcasting to an all digital formats and partly due to the growing international piracy groups. Therefore, more research is needed in both the cultural and social aspects of piracy and in methods to halt downloading, or at least slow down its expansion.

In 2005, software piracy was estimated to have cost businesses over \$1.6 billion which basically means that for every two dollars spent on legal software, one dollar's worth was obtained illegally (BSA Report, 2006:1). Software piracy is a serious concern in the business world and has many negative impacts on the economy, such as increased prices, loss of jobs, and decreased revenue from the legal software market (BSA Report, 2006:6).

Research into Piracy

There have been many explanations for violations of intellectual property rights (Piquero, 2005). Some studies suggest the violations are a product of opportunity. There is little risk of detection (Hinduja, 2001) and is arguably widespread - especially in terms of software piracy (Christensen and Eining, 1991; Hinduja, 2001). The environment, such as is found at universities

and businesses, may also create opportunity (Christensen and Eining, 1991) due to the dependence on computers (Hinduja, 2001). Deterrence theory suggests that laws will prevent copyright infringement. However, this does not work if people are unaware of the laws and penalties, which may be true in some cases (Christensen and Eining, 1991; Reid, Thompson, and Logsdon, 1992). Social learning variables, specifically peer influence, have also been used to explain intellectual property violations (Hollinger, 1993; Skinner and Fream; 1997).

Low self-control theory has also been linked to piracy, especially theft of software (Higgins, 2005; 2006). However, in a study looking at software piracy and gender, Higgins (2006) suggests that both social learning variables and low-self control are needed to be incorporated together to more fully explain piracy, especially when considering the gender gap in offending. Self control did reduce the effect gender had on offending, and the social learning variables reduced the gap between male and female offending. However, when the two theories were used together, the gender gap disappeared (page 19).

Software piracy is often seen from an economic or legal viewpoint, and there has been a lot of research investigating correlates of software piracy as well (Piquero, 2005). Software piracy has had a large amount of research devoted to it. Individuals who are most likely to pirate software are college students who are also generally Liberal Arts majors (Sims, Cheng, and Teegan, 1996). Males are more likely to pirate software than females (Hollinger, 1993; Hinduja, 2001; Higgins, 2006). Individuals who are also more likely to use a computer on a regular basis, and have high-speed Internet access are more likely to engage in pirating activity. This association to computer and high-speed internet use is attributed to the increased speed of file transferring and increase in accessibility to copyrighted material (Hinduja, 2001).

Moral and ethical decision-making has been applied to software piracy. If software piracy is viewed as a moral or ethical issue, some individuals are less likely to offend (Seale et. al, 1998; Higgins, 2005). If individuals do not view software piracy with a moral or ethical perspective, there is no consistent link to offending. However, if there are perceived negative consequences, the intention to engage in pirating/copying behavior is reduced. Interestingly, a study on moral and ethical variations in software piracy also suggested that increased cost of software was linked to a decrease in pirating behavior (Glass and Wood, 1996).

Individuals' attitudes towards software piracy have been linked to software pirating behavior in other studies (Christensen and Eining, 1991; Rahim, Seyal, and Rahman, 2001). Low self control and social learning variables (especially attitudes and peers) have been strongly linked to software piracy as well (Higgins, 2005; 2006).

In a study by Christensen and Eining (1991) students were found to have very little knowledge of copyright laws, so this lack of knowledge about copyright laws did not impact their offending. Students' attitudes were related to software piracy. Students were less likely to copy software if they felt it was wrong to do so. This study also concluded that students were also influenced by their friends' attitudes (Christensen and Eining, 1991:77). In another study of college students and software piracy, on average, students were found to have favorable attitude towards software piracy. However, the average attitude score was lowest when asking about the use of pirated software for entertainment. Students were less like to copy and use pirated game software. This indicates that students' attitudes were important for trying to explain intentions to pirate software (Rahim, Seyal, and Rahman, 2001:397). Limayen et. al. (2004) found that intentions towards piracy did not affect actual behavior. Perceived consequences were important as well as social factors, specifically the influence of family and friends.

The first systematic study of the effects of piracy comes from the Recording Industry Association of America's use of the Nielsen SoundScan's study in their lawsuit with Napster. In this study, the researchers attempted to measure how music sales fluctuated around college campuses between 1997 and 2000. They found that there were larger decreases in album sales around college campuses and reported that these effects were due to Napster's popularity on college campuses (Fine, 2000). Other studies have found different results. Specifically, Zentner (2003) found that the probability of purchasing music decreases by 30% by using file sharing networks. However, Oberholzer and Strumpf (2004) found that there was no statistically significant effect on the sale of music albums. In a study looking at piracy attitudes, researchers found that "satisfaction of current copyrighted music products is the basis for promoting consumers to refrain from unauthorized music duplication/download or purchasing pirated music products" (Chiou, Huang, and Lee, 2005: 170). The results also suggested that if individuals have a heightened sense of the ethical and moral consequences of music piracy, they are less likely to engage in the behavior. One policy suggestion the researchers discussed was for record company marketing departments to develop campaigns to increase awareness of ethical issues surrounding piracy and to create a sense of "contentedness" with the purchase so that consumers feel they spent their money well and got what they paid for (2005).

As digital technology advances, individuals (in society) are more aware of the dangers and problematic nature of computer abuse. Incidents involving fraud, viruses, and theft have been, and still are, often reported by the media (Dowland et. al., 1999). However, the largest awareness impact seemed to be from the coverage of the RIAA lawsuits. For example, according to a November-December 2003 nationwide phone survey conducted by the PEW Internet and

American Life Project, individuals who admit to downloading music files fell to 14% from the 39% in March 2003, when the survey was previously conducted (PEW Memo, January 2004).

However, most recently reported in a March 2005 poll by PEW, the percentage of those who reported downloading music had risen back to 22%. Moreover, 27% of those surveyed reported downloading media files in general, and 19% of these downloaders received files from someone's MP3 player (or iPod.) Almost 28% of downloaders received media files (music and/or video) from an instant messaging program, such as AIM or Yahoo! Messenger, or through their email. In this same survey, 53% of internet users reported that the companies who own and operate file-sharing networks should be held responsible for any of the pirating that takes place. Disturbingly, 57% of those with broadband believe the government can do little to reduce the amount of illegal music file sharing. Of those who reported that they had downloaded music but no longer do so, 33% claim they stopped because of the RIAA lawsuits and the resultant publicity (PEW Memo, March 2005). Though society now recognizes that piracy is illegal, many individuals still engage in the activity.

CHAPTER 3 METHODS

Survey Design

After IRB approval, researchers administered a self-report, pen-and-paper survey to a convenience sample of college students at a large southern U.S. university in the Spring 2006 semester. The participants were enrolled in four separate introductory classes in Criminology in the College of Liberal Arts in Sciences. The researcher assured the participants the questionnaire was voluntary and that all of their responses were anonymous and confidential.

This target population consisting exclusively of university students replicates the research designs of previous research into software piracy (Higgins, 2005; 2006). Hinduja (2001) found that college students were more likely to engage in digital piracy than individuals who are not in college.

Dataset

Sample (N=124): The ages of the total sample ranged from a low of 18 years to a high of 27 years, with an average age of 20.46 and a standard deviation of 1.569. The gender breakdown was 64.5% female and 35.5% male. As for downloading behavior, 72.6% of respondents reported illegally downloading files versus 27.4% who reportedly did not engage in the behavior. The sample was broken into the following racial categories: 58.1% White (non-Hispanic); 15.3% African-American; 18.5% Hispanic; 4.0% Asian; and 4.0% Other. For the purposes of analysis, however, race was divided as White (non-Hispanic) and All Others.

The modal class rank was Junior. The class breakdown was as follows: 11.3% Freshman; 18.5% Sophomore; 42.7% Junior; and 27.4% Senior. The majority of the convenience sample listed criminology as their major, followed by sociology, psychology, and political science. Respondents also indicated their Internet connectivity by choosing one of the following options:

Ethernet, DSL, cable modem; dial-up; do not have Internet access; other. This variable was discarded from analysis because there was not enough variation, since every respondent had access to the Internet. Descriptive statistics can be found in Table 3-1.

Hypotheses

Three hypotheses explore the relationship between self control theory and social learning theory on pirating behavior. Hypothesis one (H1) states that self control theory will predict pirating behavior in that lower levels of self control will predict higher levels of pirating behavior. Hypothesis two (H2) states that social learning variables will predict pirating behavior as follows: higher levels of pro-pirating definitions will predict higher levels of pirating behavior; higher levels of downloading peers will predict higher levels of pirating behavior, higher scores of piracy imitation will predict higher levels of pirating behavior, and higher levels of friend reinforcement and lower levels of punishment will predict higher levels of pirating behavior. Hypothesis three (H3) states that lower levels of self control will predict higher levels of pirating behavior, even while controlling for social learning measures.

Measures

Self control

The measure for self control was derived from the commonly utilized 24-item Grasmick, Tittle, Bursik, and Arneklev (1993) scale (see Higgins, 2005; 2006; Seyal, and Rahman 2001). Grasmick and colleagues designed a single scale to measure self control. The scale has good internal validity (Grasmick, et. al, 1993). Rahim, Seyal, and Rahman (2001), who also used the same self control scale, found it to be unidimensional since it yielded a Cronbach's Alpha of .886 (page 393). Low levels of self control are associated with higher numerical scores on the scale. Six dimensions were created, and, using factor analysis, the researchers concluded that self

control was unidimensional. The dimensions loaded heavily on the first factor – self control, indicating that self control was accurately measured by the scale.

The six dimensions (impulsivity, physical tasks, risk taking, simple tasks, and self-centeredness) were comprised of 4 items each. Respondents mark their level of agreement with statements on a Likert-type scale. The answer choices were as follows: 1 = strongly disagree; 2 = disagree, 3 = agree, and 4 = strongly agree. The scores were summed and then averaged for each respondent. The mean self control score was 2.030 with a standard deviation of .368. In this study, the scale has a Cronbach's Alpha of .818, and therefore can be considered a reliable scale.

Differential Association

Measures of pirating peers were adapted from the six item scale used by Krohn, Skinner, Massey and Akers (1985), which studied cigarette smoking in adolescents and social learning theory. Higher numerical scores indicate higher association with downloading friends. The scale items measured the following: percentage of male/female friends you have known longest who download or copy copyrighted materials without paying for them; percentage of male/female friends you most often associate with who download or copy copyrighted materials without paying for them; percentage of "best" male/female friends who download or copy copyrighted material without paying for them. Respondents reported the percentage of their friends who apply to each item, and these scores were summed to create the differential association score. Higher scores on the scale indicate more friends who engage in copying or downloading copyrighted material and a higher level of association with delinquent peers. The scale is reliable, with a Cronbach's Alpha of .917.

Definitions

Attitudinal measures for piracy were adapted from the 11-item scale created by Rahim, Seyal, and Rahman (2001). This scale had been used in prior research as an attitudinal measure

of software piracy (Higgins, 2005; 2006). Participants mark their level of agreement with statements on a Likert-type scale. The answer choices were as follows: 1 = strongly disagree; 2 = disagree, 3 = agree, and 4 = strongly agree.

The Piracy Definition scale was created by adding the scores for the following items: 1) I think downloading copyrighted media files helps me save money. 2) I think it is alright to copy someone else's computer software to improve my productivity. 3) I believe Internet downloading of copyrighted material helps to increase my computer literacy. 4) I think it is alright to copy copyrighted files for entertainment purposes. 5) I see nothing wrong with using pirated software if it is badly needed for the success of a project. 6) I think it is alright to use pirated materials for research purposes because everyone shares the benefit. 7) I think downloading copyrighted material is alright because it punishes companies that charge a high price for their product. The mean score was 22.213 with a standard deviation of 6.757. The scale for the current study was comprised of seven items and had a reliability score of .893.

Imitation

Imitation was measured by one independent item. 1) I watch my friends download so I know how to do it later. This had a mean score of 2.870 and a standard deviation of 1.311.

Reinforcement

Reinforcement was composed of reinforcer and punisher variables. The Peer Reinforcement variable was measured by a single item: My best friend would approve of my downloading habits. The mean score was 3.86 with a standard deviation of .998. The single item Risk measure was measured by the item There is a risk of being penalized for downloading or pirating media. This measure had a mean score of 3.560 and a standard deviation of 1.172.

The Family Reinforcement scale has a Cronbach's Alpha of .867 and is created by summing the scores for the following items: 1) My family would be very angry if they knew I

was illegally downloading or copying copyrighted material. 2) My family would be very upset if I gave someone a copy of an illegally burned CD. 3) My family would be disappointed if they learned I was downloading media from the Internet illegally. Participants mark their level of agreement with the statement on a Likert-type scale. The answer choices were as follows: 1 = strongly disagree; 2 = disagree, 3 = agree, and 4 = strongly agree. The mean score for this scale was 5.844 with a standard deviation of 2.781.

Piracy/Downloading Behavior

Downloading behavior was recorded as a raw count of the following behaviors over the last 30 days: namely downloading/copying music, downloading/copying videos, and downloading/copying software. This was chosen as a measure of piracy and downloading behavior in order to capture overall offending as well as media type (music, video, and software). The raw counts of each behavior were summed together for analytic purposes. Because of the nature of downloading and piracy behavior reported by the respondents, the data had a left skew, indicating many counts on the low end of the spectrum and few counts at the extreme high end. In order to account for this pattern, the downloading/piracy counts were then truncated at 24 counts because this was the highest count that had a frequency greater than one. All counts above this were recoded as 24 to maintain variability in the counts yet decrease the skew of the data. This gave the variable a mean downloading count of 9.762 and a standard deviation of 9.659.

Demographics

Age and gender (0 = female; 1 = male) were used as controls. Respondents recorded their race as follows: 1 = White/non-Hispanic; 2 = African American; 3 = Hispanic; 4 = Asian; 5 = other). This was then recoded as a dummy variable, with 1 = White/non-Hispanic and 0 = All Other. Year in School was also recorded as follows: 1 = Freshman, 2 = Sophomore, 3 = Junior, and 4 = Senior.

Analytic Plan

Ordinary Least Squares (OLS) regressions can be used to estimate the effects of the independent variables for self control and social learning on downloading behavior while holding each of the various control variables constant. In this study, the dependent variable is downloading and copying behavior as measured by a count of their specific acts over the previous 30 days. This will allow for more variance than a simple bivariate, dichotomous variable measuring downloading and copying behavior. However, binary logistic regression was also estimated in order to compare results and confirm that the OLS results were not an artifact of the data. The independent variables are self control and social learning, including measures of definitions, peer associations, reinforcement, and imitation. Control variables include age, race, and gender. These variables will be discussed in more detail in the Measures section of this chapter.

To test H1, namely the effect of self control on downloading/copying behavior (Model 1), OLS regressions were estimated with self control, age, race, and gender as independent variables and downloading behavior as the dependent variable. OLS regressions were also used to test H2, the effect of social learning theory on downloading/copying behavior (Model 2), using social learning (definitions, peer associations, reinforcement, and imitation), age, race, and gender as independent variables, and downloading behavior as the dependent variable. Similarly, OLS regressions were estimated to test H3, namely the effect of the independent variable, self control, on downloading behavior while holding constant the following independent variables: social learning (definitions, peer associations, reinforcement, and imitation), age, race, and gender (Model 3).

Table 3-1. Demographics of sample (N=124)

		Total Sample
Gender	Male	35.5%
	Female	64.5%
Age	Mean	20.46
	Minimum	18.0
	Maximum	27.0
Race	White	58.1%
	Other	41.9%
College year	Freshman	11.3%
	Sophomore	18.5%
	Junior	42.7%
	Senior	27.4%
Copy/download	Yes	72.6%
	No	27.4%
Raw DL count	Mean	9.62
	Minimum	0.0
	Maximum	24.0

CHAPTER 4 RESULTS

Hypothesis 1 (Model 1): The Effect of Self Control on Downloading Behavior

Hypothesis 1 states that self control theory will predict pirating behavior in that lower levels of self control will predict higher levels of pirating behavior. First, correlations were estimated on downloading, self control, age, race, and sex. Self control and downloading were weakly correlated, so as values increased along the self control scale, downloading also increased. Age and race were also weakly correlated. Age and sex were as well (Table 4-1).

To test the effect of self control on downloading/copying behavior, an OLS regression was estimated with self control, age, sex, and race as independent variables and downloading behavior as the dependent variable¹. Lower levels of self control are associated with downloading behavior (Table 4-2). This model explains 5.5% of the variance. The model is not statistically significant ($p = .145$).

Self control was a significant predictor of downloading behavior ($p = .022$). Age, race, and sex were not significant nor were these variables particularly strong predictors of downloading behavior (Table 4-2).

Hypothesis 2 (Model 2): The Effect of Social Learning on Downloading Behavior

Hypothesis 2 states that social learning variables will predict pirating behavior as follows: higher levels of pro-pirating definitions will predict higher levels of pirating behavior; higher levels of downloading peers will predict higher levels of pirating behavior, higher scores of piracy imitation will predict higher levels of pirating behavior, and higher levels of friend reinforcement and lower levels of punishment will predict higher levels of pirating behavior.

¹ Logistic regressions were estimated on the effects of self control on downloading behavior, social learning on downloading behavior, and self control on downloading while holding social learning variables constant. The results were similar to the trends found by using OLS.

First, a correlation matrix was estimated on downloading, age, sex, race, and the social learning variables (Table 4-3). Downloading was moderately correlated with definitions and peers. As pro-downloading definitions increased, so did downloading behavior. Having more peers who download was associated with higher levels of downloading. Downloading was also weakly correlated with imitation. Family punishment was weakly correlated to downloading in a negative direction, so lower levels of punishment were associated with higher levels of downloading. Definition was also weakly correlated with the other social learning variables (Table 4-3).

To test the effect of social learning theory on downloading/copying behavior, an OLS regression was estimated with social learning variables (definitions, peers, reinforcement (risk, family punishment, and peer reinforcement), and imitation), age, sex, and race as independent variables, and downloading behavior as the dependent variable (Table 4-4). This model explained 26.9% of the variance. The model is statistically significant ($F = 4.571, p < .001$).

Definitions were highly significant ($p = <.001$). Risk was also a significant predictor ($p = .020$). Peers were highly significant predictors of downloading ($p = .002$) (Table 4-4).

Hypothesis 3 (Model 3): The Effect of Self Control Theory on Downloading Behavior Controlling for Social Learning and Other Variables

Hypothesis 3 states that lower levels of self control will predict higher levels of pirating behavior, even while controlling for social learning measures. First, a correlation matrix was estimated on downloading, age, sex, race, and the social learning variables. Downloading was moderately correlated with definitions and peers. Downloading was also weakly correlated with Family Punishment and imitation. Definition was also weakly correlated with the other social learning variables. Self control was correlated with download, definition, and imitation (Table 4-5).

To test the effect of self control on downloading behavior while holding all other variables constant, an OLS regression was estimated with self control, social learning variables (definitions, peers, reinforcement (risk, family punishment, and peer reinforcement), and imitation), age, sex, and race as independent variables, and downloading behavior as the dependent variable (Table 4-6).

This model explained 27.4% of variance. The model was highly significant ($F = 4.185$, $p < .001$). Definitions ($p = .001$) and peers ($p = .005$) were highly significant. Risk was also significant ($p = .017$). All other predictors were not significant in this model (Table 4-6).

Table 4-1. Pearson Correlations for Self Control Model (N=124)**

	Download	Race	Age	Sex	Self Control
Download	1.0				
Race	-.061 (.251)	1.0			
Age	.043 (.316)	.198 (.014)*	1.0		
Sex	.085 (.173)	.015 (.432)	.256 (.002)*	1.0	
Self control	.216 (.008)*	-.046 (.305)	.018 (.422)	.072 (.214)	1.00

** Significance levels are recorded in parentheses.

* = Significant at $p \leq .05$

Table 4-2. Regression Results for Self Control Model (N=124)**

	Unstandardized B	Standard Error	Standardized B	t-test
Self control	5.455	2.346	.208	2.325 (.022)*
Age	.217	.578	.035	.375 (.708)
Sex	1.251	1.856	.062	.674 (.502)
Race	-1.149	1.773	-.059	-.648 (.518)
Construct	-5.659	12.453	-----	-.454 (.650)
R Squared	.055			
F	1.742			
Significance	.145			

** Significance levels are recorded in parentheses.

* Significant at $p \leq .05$

Table 4-3. Pearson Correlations for Social Learning Model (N=122)**

	Download	Race	Age	Sex	Definition
Download	1.00				
Race	-.066 (.236)	1.00			
Age	.039 (.334)	.199 (.014)*	1.00		
Sex	.075 (.205)	.014 (.441)	-.075 (.205)	1.00	
Definition	.392 (.000)*	-.119 (.096)	.020 (.413)	-.031 (.366)	1.00
Risk	.078 (.196)	-.022 (.403)	-.119 (.095)	.109 (.115)	-.216 (.009)*
Fam Punish	-.182 (.022)*	.036 (.346)	-.075 (.205)	-.069 (.226)	-.294 (.001)*
Peer Reinf.	.092 (.158)	-.069 (.226)	-.058 (.263)	.002 (.490)	.301 (.000)*
Imitation	.186 (.020)*	-.327 (.000)	-.166 (.034)	-.106 (.119)	.323 (.000)*
Peers	.348 (.000)*	-.153 (.047)	-.100 (.137)	-.113 (.108)	.314 (.000)*

	Risk	Fam Punish	Peer Reinf.	Imitation	Peers
Download					
Race					
Age					
Sex					
Definition					
Risk	1.00				
Punishment	.207 (.011)*	1.00			
Peer Reinf.	.025 (.394)	-.204 (.012)*	1.00		
Imitation	.064 (.241)	-.037 (.341)	.112 (.109)	1.00	
Peers	-.128 (.080)	-.178 (.025)*	.216 (.009)*	.228 (.006)*	1.00

** Significance levels are recorded in parentheses.

* Significant at $p \leq .05$

Table 4-4. Regression for Social Learning Model (N=122)**

	Unstandardized B	Standard Error	Standardized B	t-test
Race	.322	1.698	.017	.190 (.169)
Age	.332	.532	.054	.625 (.533)
Sex	1.587	1.712	.079	.927 (.356)
Definition	.495	.137	.346	3.606 (.000)*
Risk	1.688	.715	.205	2.359 (.020)*
Fam Punish	-.284	.303	-.082	-.938 (.350)
Peer Reinf.	-.911	.841	-.094	-1.083 (.281)
Imitation	.201	.679	.027	.296 (.768)
Peers	.018	.006	.282	3.197 (.002)*
Construct	-17.365	12.551	-----	-1.384 (.169)
R Squared	.269			
F	4.571			
Significance	.000*			

** Significance levels are recorded in parentheses.

* Significant at $p \leq .05$

Table 4-5. Pearson Correlations for Self Control and Social Learning Model (N=122)**

	Download	Race	Age	Sex	Definition	
Download	1.00					
Race	-.066 (.236)	1.00				
Age	.039 (.334)	.199 (.014)*	1.00			
Sex	.075 (.205)	.014 (.441)	-.075 (.205)	1.00		
Definition	.392 (.000)*	-.119 (.096)	.020 (.413)	-.031 (.366)	1.00	
Risk	.078 (.196)	-.022 (.403)	-.119 (.095)	.109 (.115)	-.216 (.009)*	
Fam Punish	-.182 (.022)*	.036 (.346)	-.075 (.205)	-.069 (.226)	-.294 (.001)*	
Peer Reinf.	.092 (.158)	-.069 (.226)	-.058 (.263)	.002 (.490)	.301 (.000)*	
Imitation	.186 (.020)*	-.327 (.000)	-.166 (.034)	-.106 (.119)	.323 (.000)*	
Peers	.348 (.000)*	-.153 (.047)	-.100 (.137)	-.113 (.108)	.314 (.000)*	
Self Control	.208 (.011)*	-.039 (.335)	.014 (.246)	-.039 (.335)	.190 (.018)*	
	Risk	Fam Punish	Peer Reinf.	Imitation	Peers	Self Control
Download						
Race						
Age						
Sex						
Definition						
Risk	1.00					
Fam Punish	.207 (.011)*	1.00				
Peer Reinf.	.025 (.394)	-.204 (.012)*	1.00			
Imitation	.064 (.241)	-.037 (.341)	.112 (.109)	1.00		
Peers	-.128 (.080)	-.178 (.025)*	.216 (.009)*	.228 (.006)*	1.00	
Self Control	-.103 (.129)	-.004 (.483)	-.054 (.279)	.300 (.000)*	.284 (.001)	1.00

** Significance levels are recorded in parentheses.

* = Significant at $p \leq .05$

Table 4-6. Regression results for Self Control and Social Learning Model (N=122)**

	Unstandardized B	Standard Error	Standardized B	t-test
Race	.193	1.705	.010	.113 (.910)
Age	.322	.532	.053	.605 (.546)
Sex	1.371	1.731	.068	.792 (.430)
Definition	.487	.138	.340	3.533 (.001)*
Risk	1.751	.720	.212	2.433 (.017)*
Fam Punish	-.305	.304	-.088	-1.001 (.319)
Peer Reinf.	-.803	.850	-.083	-.944 (.347)
Imitation	.031	.706	.004	.044 (.965)
Peers	.017	.006	.262	2.865 (.005)*
Self Control	2.109	2.370	.080	.890 (.375)
Construct	-20.615	13.082	-----	-1.576 (.118)
R Squared	.274			
F	4.185			
Significance	.000*			

** Significance levels are recorded in parentheses.

* = Significant at $p \leq .0$

CHAPTER 5 CONCLUSION

Summary of the Results

Self Control Model

The self control model was not significant in this study and only can explain 5.5% of the variance. Age was not a significant predictor in this model. This result may be due to the makeup of the sample. There is little variation in college age students, which may affect the findings. Race and sex were also not significant predictors of downloading behavior, but this may be due to the nature of the sample of college students.

Although the model is not significant, the trends are interesting. Higher levels of self control predicted higher levels of downloading behavior. Because age and sex were positive values, being older and male was related to higher levels of downloading. Interestingly, race was negative, indicating that non-whites were more likely to download than whites. There was not enough variance to further break down this variable, but more research into this finding using a larger population may reveal interesting results. The sample was 58.1% White and 64.5% female. This may have affected the results, so future research is recommended.

Social Learning Model

The social learning model explains 26.9% of the variance and was highly significant. In this model, definition, risk, and peers were significant predictors of downloading. Family Punishment, Peer Reinforcement, and imitation were not significant predictors. Age, race, and sex were not significant. Again, this may be due to the nature of the sample since there may not be much variation in college age students and the sample was over 50% White and female.

There are interesting trends revealed by this model. Of the significant variables, definition was the strongest predictor, with a standardized beta of .346. Peers (.282) and risk (.205) were

also strong predictors – three times stronger than the other variables. Definition and peers were positive values. Pro-downloading definitions and the more friends who download were associated with higher levels of downloading. Interestingly, Family Punishment and Peer Reinforcement were negative. It makes intuitive sense that the higher a perceived punishment, the less likely downloading is. However, this trend does not make sense for the reinforcer variable. The higher the value of the Peer Reinforcer, the lower the downloading values. This may be due to problems in the sample, but the relationship should be explored in the future. Because age and sex were positive values, being older and male was related to higher levels of downloading.

Self Control and Social Learning Model

The combines self control and social learning model explains 27.4% of the variance and was significant. In this model, definition, risk, and peers were significant predictors of downloading. Family Punishment, Peer Reinforcement, imitation, and self control were not significant predictors. Age, race, and sex were not significant. Again, this may be due to the nature of the sample.

The trends in this model were interesting and followed results from the above social learning model. Definition was the strongest predictor, with a standardized beta of .340. Peers (.262) and risk (.212) were also strong predictors. These variables were three times stronger than the other variables. Definition and peers were positive values which indicate that pro-downloading definitions and pro-downloading friends were associated with higher levels of downloading. Family Punishment and Peer Reinforcer were negative. Again, this suggests that the higher a perceived punishment, the less likely downloading is, and the higher the value of the reinforcer, the lower the downloading values. The trend for the Family Punishment variable makes intuitive sense. However, the trend for the Peer Reinforcement variable is in the opposite

direction from what would be expected. This may be due to problems in the sample, but the relationship should be explored in the future. Because age and sex were positive values, being older and male was related to higher levels of downloading.

Conclusion

The social learning variables definition, risk, and peers were the strongest and most significant predictors of downloading behavior. Self control was not a strong predictor in this study. The self control model was not significant and did not explain much variance in behavior. Self control, as a variable, significantly predicted downloading behavior when in a model by itself, but the addition of social learning variables visibly reduced this effect. The addition of self control to the social learning variables did not change the trends found, but it also did not add much to the predictive power of the combined model (27.4%).

The self control model predicted 5.5% of the variance while the social learning model predicted 26.9%. This jump may be due to the strength of definitions, risk, and peers as predictors of downloading behavior. It may also be due to the overwhelming amount of downloading. Over 70% of the sample reported downloading. This behavior may be an example of normalized deviance. Since it is so common, it is considered normal for college students. Further research could help answer this.

Interestingly, the combined self control and social learning model explained 27.4% of the variance. While this is an increase from the social learning model, the increase is not very large (26.9% to 27.4%). However, the three significant social learning variables (definitions, risk, and peers) remained significant and strong predictors. Therefore the increase in predictive power may be a statistical artifact due to the increase of predictors into the model. It is unlikely that the increase has much to do with self control as a predictive variable.

Limitations and Future Research

There are several limitations with this study. One major limitation of this study is the small sample size. The lack of results for some of the variables may be partially attributed to this. Because the sample is small, effects may be influenced by individual cases. However, to try and control for this, several outliers were recoded in the analysis. These were cases where students reported an abnormally high number of downloading counts. Two cases were removed because students recorded ages not consistent with the college age sample targeted for this study. This does not mean the trends suggested by the results are unimportant.

Including students from outside Liberal Arts' majors may have an impact on findings. The large number of students from the College of Liberal Arts and Sciences is not representative of the campus as a whole. First, a larger sample size encompassing a greater variety of majors would be ideal. Students in computer technology may have different attitudes and behaviors than those in agricultural studies. Students in the College of Business Administration, College of Engineering, or College of Education may behave differently than those students in the Liberal Arts. Due to time and resource restraints, this was not possible. However, future research should be able to diversify the sample to include a variety of students in the life sciences, liberal arts, and other available concentrations.

Further studies with a larger, more diverse sample would be more meaningful and could offer a deeper understanding of the behavior. A larger sample size would allow for more powerful statistics. The sample in this study was a convenience sample. It would be beneficial to repeat the study with a representative sample of the college population. Future studies should also look at comparable non-college/university respondents to try and examine the environmental or cultural effects on downloading behavior, if any.

Another limitation of this study involves the measurements. While the Grasmick, et al scale for measuring self control is widely accepted, it is an attitudinal measure of self control. Using a scale that measures behavioral components of self control may produce different results and increase self control's predictive power. It is important to include variables that measure peer influence and social learning. Stronger measures of social learning may change the effect of self control in future studies. Future research should further investigate this relationship. Both social learning and self control theories should be further tested with a more diverse sample and more exhaustive survey.

The capping of the dependent variable measuring downloading at 24 counts of downloading events is also a limitation. Although it was necessary to right-hand center this variable, it is possible that doing this affects the results. Some of the large values for downloading are, in fact, true values of downloading. By truncating the range, these high values are lost among the moderate values. Future research should investigate how this may influence results and examine if there are differences between individuals who report high levels of downloading and those who report more moderate levels.

Definitions were consistent predictors of downloading behavior. This may be a result of respondents defining physical piracy differently from digital piracy. If digital piracy has become viewed as more acceptable, then it is intuitive that pro-downloading definitions predict the behavior. Future research should investigate this relationship.

Future research should also further investigate the relationship between downloading behavior and perception of risk. In the current study, risk was found to be a predictor of downloading. However, the negative relationship was an unexpected finding. Students may recognize the risk associated with downloading but chose to do it anyway because downloading

is so accessible. This would become a question of perception of risk versus abundant opportunity. Further research should also investigate what the perceived risk entails. Is it a matter of truly an effect of copyright laws and penalties?

The lack of legal knowledge questions is also an issue. While there is one fear of legal action measure included in this study, a more complete scale of legal knowledge would allow for a better analysis of the effects of law on downloading behavior. This variable was not included in the current analyses because it did not affect any of the models. There was no variation in the sample as few students reported fearing the law, even if they did not report downloading. Future research should consider a more sophisticated analysis of the effects of law on downloading behavior. Also, this study only used a count measure to ascertain downloading behavior over a thirty day period. Future research may be able to measure this behavior more accurately by using a more complete measurement that includes frequency of downloading as well as the size of the downloaded files, which has changed with technology.

As technology rapidly advances, companies struggle to catch up. It has become easier and quicker to download larger and larger files. DVDs and CDs are easily copied. This is an important issue as the movie and recording industries fight to prevent monetary losses. Research into this behavior is necessary to determine the extent of the problem as well as to help prevention efforts. Researchers should continue to explore this phenomenon as the changes offer more and more opportunities for research.

APPENDIX
SURVEY

The following questions inquire about some general qualities and behaviors about yourself.

What is your age? _____

What is your sex? _____ Male _____ Female

What is your race/ethnicity?

_____ White (non-Hispanic) _____ Hispanic
_____ African-American/Black _____ Asian
_____ Other (Please specify: _____)

What is your current major? _____

What is your current college standing?

How do you connect to the internet in your residence?

_____ Freshman _____ Ethernet _____ Cable modem
_____ Sophomore _____ DSL _____ Dial-up
_____ Junior _____ I do not have internet access at home
_____ Senior _____ Other (please specify): _____
_____ Graduate

Do you live on campus? _____ Yes _____ No

If yes, have you ever lost internet privileges due to internet activities banned by housing? _____ Yes _____ No

What is ICARUS?

Do you own a computer? _____ Yes _____ No (If no skip to page #3)

Do you listen to music on your computer? _____ Yes _____ No

If yes, how many songs do you have on your computer at this time? _____ songs

Of the songs on your computer what percentage:

Are from CD's you have purchased? _____ %
Are copied from music (singles or CD's) friends have purchased? _____ %
Were paid for and downloaded from the internet? _____ %

Do you download songs from sites that allow you to pay for downloading privileges or pay-per-song?
_____ Yes _____ No

If yes, how many songs have you downloaded this month from the subscription or pay-per-song site?
_____ songs

Do you watch video files (tv shows or movies) on your computer? _____ Yes _____ No

If yes, how many video files do you have on your computer at this time? _____ files

Of the video files on your computer what percentage:

Have you purchased? _____ %
Are copied from files that friends have purchased? _____ %
Were paid for and downloaded from the internet? _____ %

Do you download videos from sites that allow you to pay for downloading privileges or pay-per-song?
_____ Yes _____ No

If yes, how many videos have you downloaded this month from the subscription or pay-per-song site?
_____ videos

Do you have computer software on your computer that was not included on your computer when you purchased it?
_____ Yes _____ No

If yes, how many software programs do you have on your computer at this time? _____ programs

Of the software programs on your computer what percentage:

Have you purchased? _____ %
Are copied from files that friends have purchased? _____ %
Were paid for and downloaded from the internet? _____ %

Do you download or copy copyrighted materials? Yes No (If no, skip to next page)

How many times in the past 30 days have you:

Downloaded or uploaded music from the internet without paying for it? _____ times

Downloaded or uploaded videos from the internet without paying for it? _____ times

Downloaded or uploaded computer software programs from the internet without paying for it? _____ times

Copied music (singles or CD's) without paying for it? _____ times

Copied videos or other media files without paying for it? _____ times

Copied computer software programs without paying for it? _____ times

When did you start downloading or copying copyrighted materials? _____ months ago

Where did you learn how to download or copy copyrighted materials? (Check all that apply)

Friends Family Self taught Other (please specify): _____

Do you fear legal punishment for downloading or copying copyrighted materials? Yes No

The following questions ask about some general attitudes. Please circle the number corresponding to the response that best describes your feelings.

(1) Strongly disagree (2) Somewhat disagree (3) Agree somewhat (4) Strongly agree

I often act on the spur of the moment without stopping to think.	1	2	3	4
I almost always feel better when I am on the move than when I am sitting and thinking.	1	2	3	4
The things in life that are easiest to do bring me the most pleasure.	1	2	3	4
Sometimes I will take a risk just for the fun of it.	1	2	3	4
I lose my temper pretty easily.	1	2	3	4
If things I do upset people, it's their problem not mine.	1	2	3	4
Excitement and adventure are more important to me than security.	1	2	3	4
When I'm really angry, other people better stay away from me.	1	2	3	4
I'm more concerned with what happens to me in the short run than in the long run.	1	2	3	4
When things get complicated, I tend to quit or withdraw.	1	2	3	4
I try to look out for myself first, even if it means making things difficult for other people.	1	2	3	4
I don't devote much thought and effort to preparing for the future.	1	2	3	4
Often, when I'm angry at people I feel more like hurting them than talking to them about why I am angry.	1	2	3	4
I dislike really hard tasks that stretch my abilities to the limit.	1	2	3	4
I like to test myself every now and then by doing something a little risky.	1	2	3	4
I like to get out and do things more than I like to read or contemplate ideas.	1	2	3	4
I frequently try to avoid projects that I know will be difficult.	1	2	3	4
If I had a choice, I would almost always rather do something physical than something mental.	1	2	3	4
I sometimes find it exciting to do things for which I might get in trouble.	1	2	3	4
I'm not very sympathetic to other people when they are having problems.	1	2	3	4
I will try to get the things I want even when I know its causing problems for other people.	1	2	3	4
I seem to have more energy and a greater need for activity than most other people my age.	1	2	3	4
I often do whatever brings me pleasure here and now, even at the cost of some distant goal.	1	2	3	4
When I have a serious disagreement with someone, it's usually hard for me to talk calmly about it without getting upset.	1	2	3	4

The following questions ask about your friends behaviors.

Percentage of male friends you have known longest who download or copy copyrighted materials without paying for them. 0 1 2 3 4 5 6 7 8 9 10
0% 50% 100%

Percentage of male friends you most often associate with who download or copy copyrighted materials without paying for them. 0 1 2 3 4 5 6 7 8 9 10
0% 50% 100%

Percentage of "best" male friends who download or copy copyrighted material without paying for them. 0 1 2 3 4 5 6 7 8 9 10
0% 50% 100%

Percentage of female friends you have known longest who download or copy copyrighted materials without paying for them. 0 1 2 3 4 5 6 7 8 9 10
0% 50% 100%

Percentage of female friends you most often associate with who download or copy copyrighted materials without paying for them. 0 1 2 3 4 5 6 7 8 9 10
0% 50% 100%

Percentage of "best" female friends who download or copy copyrighted material without paying for them. 0 1 2 3 4 5 6 7 8 9 10
0% 50% 100%

Please indicate your level of agreement with the following statements by circling the number corresponding to the response that best describes your feelings.

(1) Strongly disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly agree

My family would be very angry if they knew I was illegally downloading or copying copyrighted material.	1	2	3	4	5
My friends would be impressed if I was illegally downloading copyrighted material.	1	2	3	4	5
I know people who can help me pirate.	1	2	3	4	5
My family would be very upset if I gave someone a copy of an illegally burned CD.	1	2	3	4	5
My best friend would approve of my downloading habits.	1	2	3	4	5
I watch my friends download so I know how to do it later.	1	2	3	4	5
My family would be disappointed if they learned I was downloading media from the Internet illegally.	1	2	3	4	5
I think downloading copyrighted media files helps me save money.	1	2	3	4	5
I think it is alright to copy someone else's computer software to improve my productivity.	1	2	3	4	5
I see nothing wrong with giving my friends copies of software, music CD's or DVD's in order to foster friendships.	1	2	3	4	5
I believe Internet downloading of copyrighted material helps to increase my computer literacy.	1	2	3	4	5
I think it is alright to copy copyrighted files for entertainment purposes.	1	2	3	4	5
I see nothing wrong with using pirated software if it is badly needed for the success of a project.	1	2	3	4	5
I think it is alright to use pirated materials for research purposes because everyone shares the benefit.	1	2	3	4	5
I think downloading copyrighted material is alright because it punishes companies that charge a high price for their product.	1	2	3	4	5
I think it is alright to use pirated material if it improves my knowledge.	1	2	3	4	5
I do not think it is alright to use pirated media because it may create a negative image.	1	2	3	4	5

Please indicate your level of agreement with the following statements by circling the number corresponding to the response that best describes your feelings.

(1) Strongly disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly agree

There is a risk of being penalized for downloading or pirating media.	1	2	3	4	5
I will save time in acquiring the material I want by downloading or pirating media.	1	2	3	4	5
Downloading or pirating copyrighted material will deteriorate my sense of ethics.	1	2	3	4	5
I will save money by downloading or pirating media.	1	2	3	4	5
By downloading or pirating copyrighted materials, I will contribute to higher consumer product prices.	1	2	3	4	5
I will improve my performance on the computer by downloading or pirating media.	1	2	3	4	5
I will improve my quality of life by downloading or pirating copyrighted materials.	1	2	3	4	5
I will suffer little damage by downloading or pirating copyrighted materials.	1	2	3	4	5
I will gain significantly by downloading or pirating copyrighted materials.	1	2	3	4	5
I will possess more songs, videos, and software by downloading or pirating materials.	1	2	3	4	5
I intend to pirate or download copyrighted material in the future.	1	2	3	4	5
All things considered, I expect to pirate or download copyrighted material in the future.	1	2	3	4	5
The number of material I downloaded or pirated is high.	1	2	3	4	5
I will pirate or download copyrighted material in the future.	1	2	3	4	5
Copyright holders deserve to be compensated for their product.	1	2	3	4	5
It is exciting to pirate or download copyrighted material.	1	2	3	4	5
It is unethical to pirate or download copyrighted material.	1	2	3	4	5
It is wise to pirate or download copyrighted material.	1	2	3	4	5
I don't think twice before pirating or downloading copyrighted material.	1	2	3	4	5
I respect the copyright holder.	1	2	3	4	5
Copyright holders are smart and creative.	1	2	3	4	5
Copyright holders do not receive adequate compensation for their products	1	2	3	4	5

Please indicate your level of agreement with the following statements by circling the number corresponding to the response that best describes your feelings.

(1) Strongly disagree (2) Disagree (3) Neither Agree nor Disagree (4) Agree (5) Strongly agree

People who download or copy music they did not purchase are dishonest.	1	2	3	4	5
There is nothing wrong with friends downloading copies of my music as long as I don't charge them for it.	1	2	3	4	5
I would feel guilty if I downloaded songs I had not purchased.	1	2	3	4	5
There is nothing wrong with downloading songs without paying for them as long as it is for a one time use.	1	2	3	4	5
My school discourages downloading music I have not paid for.	1	2	3	4	5
There is nothing wrong with students downloading songs without paying for them since students have limited financial resources.	1	2	3	4	5
My friends download music to share with others.	1	2	3	4	5
I download or copy music my friends have paid for.	1	2	3	4	5

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