Perceptions of Peer-to-Peer File Sharing Among University Students

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ABSTRACT

In recent years the issue of digital file sharing has become a hotly debated topic among those in the fields of computer science, the music industry, and the movie industry. The purpose of this research was to examine the perceptions of peer-to-peer file sharing among university students. The results of the study revealed that a majority of respondents did in fact use peer-to-peer file sharing and generally perceived the use of the software to be neither illegal nor unethical. Male respondents were found to generally be more certain that the act of file sharing was ethical and legal, while female respondents were more uncertain about the legality and ethics of file sharing.

Within the last five years, the landscapes of the music and video industry have dramatically changed. Like many areas of life that have undergone change with improvements in technology, the acquisition of popular music and movies has moved to the Internet. Gone are the days where consumers wait anxiously in the streets for the release of the latest compact disc from their favorite singer, as are the days where moviegoers camp out over night to catch the latest release of a long-awaited movie. Today, consumers merely connect to the Internet and begin downloading their favorite movies and music without ever leaving the comfort of their homes.

According to a recent congressional report (2002), there are over 3 million users online at any given time swapping music at an incredible rate of 2.6 billion songs per month and movies at a rate of 12 to 18 million files per month. With such a massive amount of file sharing occurring via the Internet, the congressional report argues that songwriters are now losing $240 million a month to Internet piracy, and if the problem persists, it is estimated that the annual costs to the performers could reach $3.1 billion a year by the year 2005 (Gillen & Garrity, 2000). Unfortunately, the very nature of the retail industry makes estimating the impact of file sharing on CD sales difficult. According to the Recording Industry Association of America (RIAA; 2003), record sales have dropped drastically in the wake of advances in peer-to-peer file sharing. Personal experiences of these authors in researching file sharing and discussing the activity with file sharers would support this argument, as many individuals have indicated that they have not purchased a CD since they learned how to use file sharing programs.

Hollywood insiders also fear the impact that online file sharing will have on the future of box office sales. Many in the industry believe that the sharing of movies via the Internet is certain to lead to a decrease in sales at the box office. Others, however, argue that while file sharing is sure to impact the purchase of videos and digital versatile discs (DVDs), the box office will most likely see very little, if any, losses ("Lights! Camera! No Profits!," 2003). Perhaps this view is due to the fact that outings to a movie theater are often more than a trip to see a movie, and are additionally an opportunity to engage in social outreach. The downloading of films is certainly cheaper, but it removes the face-to-face contact a consumer may have with their peers, and therefore the box office will not suffer the same consequences as the purchase of videos and DVDs that are used more for private, home viewing.

Over the last three years there has been a considerable amount of media coverage devoted to the issue of online file sharing through the use of peer-to-peer file sharing programs, which are commonly referred to as P2P programs. The vast majority of this coverage, however, has discussed theories and beliefs espoused by those in the music and movie industries, and as such, the reports have been one-sided and contained little in the way of actual empirical research. Additionally, many articles have claimed that universities have become breeding grounds for Internet piracy because of open access to computers and non-stringent computer security policies. However, there has been little research concerning the use of peer-to-peer software on university campuses, and how university students perceive file sharing. It was the intent of this article to provide an introductory examination of these issues through consideration of students' perceptions at a mid-size state university in the South. Students' perceptions concerning issues of traditional copyright violations were examined in conjunction with students' perceptions of peer-to-peer file sharing, in an attempt to determine: (a) students' feelings about ethical and legal issues surrounding file sharing, and (b) the extent of file sharing among university students. In an attempt to better facilitate this understanding, however, it is first necessary to briefly examine peer-to-peer file sharing and how the technology has developed.

The development of peer-to-peer networking

Peer-to-Peer networking, which is commonly denoted by the designation "P2P", refers to the connecting of two or more computers via the Internet or another computer network in order to share files and resources more efficiently (Jacover, 2002). The concept behind peer-to-peer is certainly not new, as the networking protocols that make up the Internet were designed to allow for computers to share files and resources. In fact, it was this necessity of sharing resources and files that led researchers at the Massachusetts Institute of Technology (MIT) to develop the early forerunner of the Internet, the ARPANET (Advanced Research Projects Agency Network) (Segaller, 1998). Therefore, it should be noted that there are legitimate uses for peer-to-peer networking programs. However, in reality there are relatively few individuals who employ the technology for legitimate business uses. Today, peer-to-peer networking has become synonymous with the violation of copyright law in regards to transfers of music, movies, software, pornography, and text documents.

Recognition of this use for peer-to-peer software was brought to the attention of the public in the late 1990s with the release of the Napster file sharing program. Napster was developed by a college dropout, who at the age of 19 wrote the computer program that would

allow users to swap music files stored on their computer's hard drive. To facilitate faster transfers of these files, the software took advantage of the new MP3 file compression algorithm; an algorithm that allowed for significantly greater file compression of audio files (Carey & Wall, 2001).

MP3 is the abbreviation for motion pictures group audio layer 3, and is a compression algorithm that allows for compression of audio files at a rate of 10:1 or 12:1. The MP3 algorithm works by stripping away portions of an audio file that is inaudible to the human ear, in a process known as perceptual audio coding (Blackowicz, 2001; Golangelo, 2002; Greene, 2001). The value of MP3 compression became immediately apparent with the release of the first version of the Napster software. Prior to employing the MP3 compression algorithm, a music file stored on a computer could be as large as 40 to 45 megabytes in size, and would take around one and one-half hours to transfer over a phone line connection that was limited to a speed of 28.8 to 56.6 kilobytes a second. After using the MP3 algorithm, the same music file would be around 3 to 5 MB and would take around 8 to 15 minutes to transfer.

Users of the Napster software were required to download a program from the company's official website that would allow for access to the Napster music servers, a collection of central computers administered by the Napster company. Once users logged onto the Napster network they were asked which files they desired to share from their computer's hard drive. When a user established their shared folder, they were allowed to begin uploading and downloading music files. The one limitation to the file sharing allowed under the Napster software was that it only allowed for the sharing of audio files that were compressed with the MP3 algorithm (Jacover, 2002; Zepeda, 2002).

Napster became incredibly popular in a short time. With the increased awareness of the software's existence, hundreds of thousands of individuals began using the technology to transmit audio files that were copyright protected. At Napster's highest volume of file sharing, it has been estimated that 87% of the files on the network were believed to be in violation of copyright law (Berger, 2001). The RIAA, along with several high profile musical groups like the heavy metal band Metallica, began legal proceedings against the Napster Company in 2000 after repeated attempts to have copyrighted music files removed from the Napster network were disregarded. Napster immediately countered the lawsuit by attempting to argue that their situation was analogous to that of Sony in the case of *Sony Corp. of America v. Universal City Studios, Inc.* (1984). The situation in the Napster case was considered significantly different from that of Sony in that users of Sony were using the videocassette recorder (VCR) technology as a means of viewing non-commercial programs at a later date. Napster, on the other hand, was used as a means of circumventing copyright protections, and was costing artists considerable amounts of money as fewer people were purchasing music cassettes and compact discs (Greene, 2001).

When Napster began to realize they were more than likely going to lose their fight, they began a series of creative arguments as a means of stalling their demise until they could establish a pay-for-service program. One argument launched by Napster was that the record industry had failed to provide adequate proof of which copyrights they owned that were being violated through the use of the Napster software. Napster was aware that the RIAA did not maintain

these records in digital format, and would therefore have to take the necessary time and financial expense to transfer this information from paper format to digital format (Pitta, 2001).

The ploys were unsuccessful in saving Napster, but these attempts to stall did allow other peer-to-peer software manufacturers to begin developing new and improved versions of peer-to-peer software. Out of the ashes of Napster arose new file sharing programs like Morpheus, BearShare, Limewire, and Kazaa. These newer programs, however, differ from their predecessor in two primary ways. First, current programs do not require a central server to operate, which means that each user running the software is in essence running a miniature server and the software's designers are removed from the networking circuit (Gillen & Garrity, 2000). Second, newer peer-to-peer programs allow for users to swap more than music. Today, it is possible to transfer movies, software applications, pictures, and document files (Kazaa, 2003). Subsequent legal maneuvers against these software manufacturers have resulted in little progress, as the software's designers are constantly improving their technology to provide better pirating techniques (Congressional Report, 2002).

The role of the university

The original benefit of using the MP3 algorithm was the speed associated with downloading files compressed with the technology. Today, it could be questioned whether compression is as important to peer-to-peer file sharers, as high speed Internet access is more commonly available. Cable modems and Digital Subscriber Lines (DSLs), which are referred to as broadband Internet connections, allow for transfers of data at speeds greater than 50 times that of traditional phone modems. Both forms of broadband Internet access are becoming more commonplace in residential establishments, making file sharing an even faster activity. When discussing the issue of high-speed Internet, the university is normally mentioned because of the Internet connectivity offered by most institutions. Many, if not all, universities commonly use connection lines that are several times faster than Cable modems and DSL modems. However, the question here is whether college students increase their peer-to-peer file sharing when they have access to university high-speed Internet connections? Representatives of the RIAA claim this answer is yes, and further argue that allowing students easy access to such high-speed connections has led to the point where universities can be labeled as breeding grounds for Internet piracy (Ostrom, 2002).

In response to this criticism, some universities have begun implementing better policies concerning the use of university Internet access. These policies, however, have been implemented not as a means of regulating peer-to-peer usage but instead are being used because file-sharing has been cited as a cause of slow network traffic within the university setting (Carlson, 2001; Ostrom, 2002). The RIAA has also attempted to force universities to ban the use of peer-to-peer software on campus. Within the last two years, several larger universities have received letters from the RIAA indicating that they will be named as defendants in future lawsuits if they do not remove access to peer-to-peer programs (Carlson, 2003). It is believed that these letters resulted in one university seizing 100 computers that were believed to have been used in wide-scale file sharing activities. In response, the RIAA claims they do not desire for universities to seize computers, they merely desire for universities to block access to peer-to-peer programs. Citing their fear of becoming a "spy" for the RIAA, many universities have

refused this request (Ostrom, 2002). Should it be found that universities are truly becoming breeding grounds for Internet piracy, it would seem a logical step for universities to begin work on developing programs to possibly control the growth of the problem. These programs do not necessarily require regulation of Internet activities, but could instead instruct users of university services to better understand the proper use of university resources.

Responses by the criminal justice system to the problem

With increasing pressure from the RIAA, legislators have begun drafting legislation that deals specifically with the issue of copyright protection on the Internet. One such piece of legislation is that of the Digital Millennium Copyright Act (DMCA), which deals with copyrights of materials that are digital in nature (Ginsburg, 2000; Greene, 2001; Johnstone, 2001). While the DMCA has received some coverage because of its mention in several high-profile copyright infringement cases, it has only recently been used with frequency as a justification for obtaining subpoenas for users who have been accused of trading copyrighted materials.

Instead, the recording industry, while arguing for better legislation, has turned to creative means of responding to the problem of peer-to-peer file sharing. For example, the RIAA has recently applied the use of "spoofed" files, which are files that appear to be a popular song or movie but when opened contain no content (Snider, 2002). The use of these files does little to punish those who share files, but it does result in frustration for users who devote the necessary time to download the file, only to subsequently discover that the file is a fake. Other techniques involve the use of NetPD software that allows users to trace a copyright protected file that is being traded online. The creators of the software claim that the software is even capable of tracing the file back to the original individual that posted the file, but the software has received little attention and this feature has never been verified by an outside source (Masson, 2000).

Gillen and Garrity (2000) have long argued that attempts by the RIAA and programmers to develop copyright protections will be unsuccessful. Citing research conducted by Forrester Research, the two researchers have claimed that the solution lies in accepting MP3 technology and developing better awareness campaigns. Additional research has shown that the large number of users who share files online has created a situation where the criminal justice system simply cannot handle the problem with any true level of success (Congressional Report, 2002).

The belief that enforcement by the criminal justice system is impossible has led some to argue that the solution lies in empowering the copyright holders to protect their materials (Fazekas, 2002). A recent bill (H.R. 5122) introduced by Congressman Berman would allow copyright owners to remove copyright protected materials from the computers of individuals who are sharing the files online and via peer-to-peer networks (Snider, 2002). Bill H.R. 5122, which is commonly referred to as "Berman's Bill", would allow for copyright owners to interdict, redirect and spoof users who are sharing files; the problem with this aspect of the bill is that many believe the bill would allow for copyright owners to launch denial of services attacks against individual users (Fazekas, 2002).

Other opponents of the Berman Bill claim that passage of the bill would create a scenario analogous to that of the Wild West, where the user with the greatest technological "guns" will win (Congressional Report, 2002). The Berman Bill may be too broad and would allow for copyright owners to hack into the computers of personal users who are found to be sharing copyrighted materials (Fazekas, 2002), thereby creating a dichotomy in that hacking is still criminalized under the United States Criminal Code, so one piece of legislation cannot legalize such attacks against personal users and then penalize personal users for responding to attacks. Currently, the Berman Bill is still in Congress being debated and it will be interesting to see if the bill makes it out of Congress as it currently stands, or if there will be changes made that govern when copyright holders may access the computers of private citizens.

METHOD

There have been a considerable number of news reports concerning the use of peer-to-peer file sharing programs among university students; however, there appears to be little empirical research that examines the issue. The current research project attempted to examine university students' perceptions of peer-to-peer file sharing. Specifically, the research project attempted to answer the following questions related to peer-to-peer file sharing: (a) Do university students believe that copying of commercial programs, movies, etc. is unethical or illegal? (b) Do university students believe that peer-to-peer file sharing is unethical or illegal? and (c) Have university students increased their peer-to-peer file sharing as they have gained increased access to high-speed Internet access?

Purposive sampling was used in an attempt to ensure that a percentage of participants would be criminal justice majors and the remaining participants would be a combination of other majors. Criminal justice majors were included because there was an interest in determining whether criminal justice majors, who have studied the legal system and have displayed an interest in enforcing the law or serving the field of criminal justice, would perceive the act of file sharing differently from those who had little or no understanding of criminal justice or the field of law. Six courses were selected, three randomly selected criminal justice courses and three randomly selected non criminal justice courses (Sociology, History, Political Science). Professors and instructors were consulted and informed of the research. All six agreed to allow their students to participate in the study. Surveys were administered over the course of one week during the Spring 2003 semester. The survey was administered during the first 15 minutes of each class, resulting in a response rate of 98% (*N*=171), with the remaining 2% declining to participate in the study.

Participants were provided a 20-item survey instrument designed to determine an individual's perceptions of copyright violations and more specifically, copyright violations involving peer-to-peer file sharing. The questions related to whether (a) copying copyrighted materials was unethical, (b) copying copyrighted materials was illegal, (c) sharing files via peer-to-peer networks was unethical, and (d) sharing files via peer-to-peer networks was illegal. Additionally, participants were asked to respond to whether or not they equated the act of file sharing with the act of physically shoplifting music, movies, or software. Responses were categorical in nature, requiring participants to respond to each question with an answer of yes, no, or uncertain.

Participants were also asked to answer questions relating to the frequency in which they used peer-to-peer file sharing programs. These questions were designed to determine: (a) how often participants used peer-to-peer file sharing applications, (b) if their use of peer-to-peer software increased with the advent of broadband Internet connectivity, and (c) if their use of peer-to-peer software increased with their access to high-speed Internet access provided by the university. Finally, participants were asked to answer a small number of questions related to demographics. Specifically, participants were asked their age, gender, university classification (freshman, sophomore, etc.) and major. This information was used to examine whether there was a significant difference in perceptions of peer-to-peer file sharing among gender and major.

RESULTS

The participants in the study ranged in age from 18 to 40, with 85% of participants being 24 years of age or younger. In examining the participants' major, 55% were majoring in criminal justice, with the remaining 45% majoring in non criminal justice fields such as history, education, biology, etc. Representation of gender was relatively equal, with 52% of participants being male and 48% being female. In regards to academic classification, 9% were freshmen, 13% were sophomore, 33% were juniors, 39% were seniors, and 6% were graduate students.

Violations of traditional copyright

In examining respondents' perceptions of copyright violations, the first consideration involved answers concerning whether the copying of commercial software without proper authority or permission was illegal. It was revealed that a majority of respondents felt that the copying of commercial software programs was not illegal, while a small percentage of respondents were uncertain about the legality of such behavior (see Table 1). Further examination revealed that there was no statistically significant difference between groups when considering both gender and major. Further, the majority of respondents did not feel that the act of copying commercial software without permission was unethical, with only a small percentage indicating certainty that such activity was unethical. Also, a small percentage of respondents indicated that they were uncertain about the ethics associated with the copying of commercial software. Once again, no significant difference was discovered when examining both gender and major.

Table 1
Responses Related to Traditional Copyright Violations

	n	Percentage	Chi-Square	DF
Copying Legal				
Yes	55	32%		
No	90	53%		
Uncertain	26	15%	36.04	2
Copying Ethical				
Yes	42	25%		
No	102	60%		
Uncertain	27	15%	55.26	2

Copyright violations via peer-to-peer

The survey next examined respondents' views concerning the illegality of trading copyrighted materials via peer-to-peer networking programs. A majority of respondents, almost two-thirds, indicated that they did not believe the use of peer-to-peer networking to be illegal. In fact, several respondents wrote in a response of "it is too easy to get to be illegal." A small percentage indicated that they were uncertain about the legality of the behavior, with an even smaller percentage indicating certainty about the illegal nature of file sharing. A statistically significant difference between genders was discovered, with male respondents generally feeling that the use of file sharing software was not illegal, while female respondents were less likely to indicate certainty about the illegal nature of file sharing (see Table 2). A comparison of responses by major indicated that there was no significant difference between criminal justice majors and non criminal justice majors.

Respondents' views concerning the unethical nature of file sharing were examined next. A majority of respondents did not feel that the sharing of files via peer-to-peer networks was an unethical activity. One-forth of respondents were uncertain about the ethics of file sharing, and a small percentage of respondents felt that file sharing was an unethical activity (see Table 2). When examining gender, there was a statistically significant difference between the genders. While an overwhelming number of male respondent (70%, $n = 63$) did not find the software's use unethical, female respondents were more likely to be uncertain about the activity or view the activity as unethical. A statistically significant difference between major was also found. Sixty-nine percent ($n = 64$) of criminal justice majors responded that sharing files via peer-to-peer networks was not unethical, while non criminal justice majors were less likely to find sharing files ethical (41%, $n = 42$) and more likely to claim uncertainty (35%, $n = 27$) about the ethical implications of file sharing (see Table 2).

Shoplifting. The next consideration involved comparing respondents' views on traditional shoplifting and whether they equated the act of file sharing to shoplifting. Overwhelmingly, respondents indicated they would not engage in shoplifting (see Table 3). In considering both major and gender there was no significant difference in regards to whether respondents would consider engaging in the act of shoplifting. Further, a majority of respondents (71%, $n = 122$) did not equate the act of file sharing via peer-to-peer networks to the act of physically shoplifting movies, music, or software from a retail store. There was a statistically significant difference between gender, with males overwhelmingly refusing to equate the two acts, while female respondents were less likely to refuse equating the act but more likely to claim uncertainty (see Table 3). A statistically significant difference was also found when considering major. Criminal justice majors were more certain that the act of file sharing was not equivalent to the act of shoplifting, while non criminal justice majors were more uncertain about the equality of the acts.

Table 2
Responses Related to P2P Copyright Violations

	n	Percentage	Chi-Square	DF
P2P Illegal				
Overall				
Yes	25	15%		
No	110	64%		
Uncertain	36	21%	74.98**	2
Male				
Yes	18	20%		
No	61	69%		
Uncertain	10	11%		
Female				
Yes	7	9%		
No	49	60%		
Uncertain	26	31%	12.995**	2
Criminal Justice Major				
Yes	18	19%		
No	60	64%		
Uncertain	16	17%		
Non Criminal Justice Major				
Yes	7	9%		
No	50	65%		
Uncertain	20	26%	4.55	2
P2P Unethical				
Overall				
Yes	25	14%		
No	105	62%		
Uncertain	40	24%	63.82**	2
Male				
Yes	13	15%		
No	63	70%		
Uncertain	13	15%		
Female				
Yes	12	15%		
No	42	52%		
Uncertain	27	33%	8.78*	2
Criminal Justice Major				
Yes	16	17%		
No	64	69%		
Uncertain	13	14%		
Non Criminal Justice Major				
Yes	9	12%		
No	41	53%		
Uncertain	27	35%	10.48**	2

*Note. * p < .05   ** p < .01*

Table 3
Responses Related to File Sharing and Shoplifting Views

	n	Percentage	Chi-Square	DF
Would Shoplift w/ Opportunity				
Overall				
Yes	1	.6%		
No	169	98.8%		
Uncertain	1	.6%	330.11**	2
Male				
Yes	1	1.1%		
No	87	97.8%		
Uncertain	1	1.1		
Female				
Yes	0	0%		
No	82	100%		
Uncertain	0	0%	1.87	2
Criminal Justice Major				
Yes	0	0%		
No	93	98.9%		
Uncertain	1	1.1%		
Non Criminal Justice Major				
Yes	1	1.3%		
No	76	98.7%		
Uncertain	0	0%	2.04	2
File Sharing Comparable to Shoplifting				
Overall				
Yes	23	14%		
No	122	71%		
Uncertain	26	15%	111.26**	2
Male				
Yes	12	14%		
No	72	81%		
Uncertain	5	5%		
Female				
Yes	11	13%		
No	50	61%		
Uncertain	21	26%	13.59**	2
Criminal Justice Major				
Yes	15	16%		
No	72	77%		
Uncertain	7	7%		
Non Criminal Justice Major				
Yes	8	10%		
No	50	65%		
Uncertain	19	25%	10.05**	2

Note. * *p* < .05   ** *p* < .01

File sharing activity

Respondents were also asked to rank the frequency in which they downloaded materials using peer-to-peer file sharing software. Almost half of all respondents indicated regular file sharing activity (see Table 4). Utilizing the Mann Whitney U-test, a statistically significant difference between male and female file sharing frequency was discovered. With a mean rank for male respondents of 97.31 and a mean rank for female respondents of 73.72, these results indicate that females in the current study shared files with less frequency than their male counterparts (U = 2642, *p* = .001). A similar comparison between respondents' major was also conducted. However, there was no significant difference found between the frequency of file sharing between majors (U = 3174, *p* = .149). In examining the types of files most commonly downloaded, 44% of respondents were split among sharing a combination of music, movies, software, and text files; while 32% downloaded only music, and 12% traded only music and movies.

The issue of whether broadband Internet access, and specifically university network access, impacted respondents' desire to share files via peer-to-peer programs was examined next. Twenty eight percent of respondents were removed from this analysis, having answered that they traded neither before nor after the introduction of broadband activity. Of those who did utilize file sharing programs, a majority (72%, *n* = 88) had increased their file sharing upon gaining access to a broadband Internet connection. There was no significant difference between gender or major when examining this issue.

The final issue to be considered was whether access to the university's high speed network resulted in an increase in file sharing. The university where this data was collected is a wireless compatible campus, meaning that students who attend the university can connect to the university's high-speed Internet connection via a wireless card attached to the student's computer. Additionally, the university's library is enabled with high-speed connections in every study carrel and study room. While current findings indicated that students increased their file sharing with increased access to high-speed Internet connectivity, an overwhelming 70% (*n* = 78) of respondents indicated that they did not increase their peer-to-peer file sharing upon gaining access to the university's high-speed Internet activity. No significant difference in peer-to-peer file sharing was found between responses when comparing gender and major. Interestingly, in ranking the frequency in which four different modems were used by respondents (56.6 dial-up, cable, DSL, and university network), university high-speed Internet access was the third ranked modem used by participants in this study, with only 23% (*n* = 24) of respondents using this form of Internet connectivity. The most commonly used modem was the 56.6 dial-up modem, while Cable modem was the second most used Internet connection, and the DSL modem was the fourth ranked modem (see Table 4).

Table 4
Responses Related to File Sharing Activity

		n	Percentage	Chi-Square	DF
File Sharing Frequency					
Never		65	38%		
Rarely		26	15%		
Occasionally		37	22%		
Frequently		43	25%	18.92**	2
Modem Used to Share Files					
Dial Up Modem	32		31%		
DSL		17	17%		
Cable		30	30%		
University Network		24	23%	5.311	3
Increased File Sharing w/ Broadband					
Overall					
Yes		88	72%		
No		35	28%	22.84**	1
Male					
Yes		51	69%		
No		23	31%		
Female					
Yes		37	75%		
No		12	25%	.629	1
Criminal Justice Major					
Yes		54	74%		
No		19	26%		
Non Criminal Justice Major					
Yes		34	68%		
No		16	32%	.520	1
Increased File Sharing w/ University Network Access					
Overall					
Yes		34	30%		
No		78	70%	17.29**	1
Male					
Yes		22	32%		
No		47	68%		
Female					
Yes		12	28%		
No		31	72%	.198	1
Criminal Justice Major					
Yes		24	36%		
No		43	64%		
Non Criminal Justice Major					
Yes		10	22%		
No		35	78%	2.36	1

*Note. * $p < .05$ ** $p < .01$*

Because there was the possibility that not all of these students had access to the high-speed capabilities of the university (some may not have lived on campus and not have had laptops to connect with), these results were compared with information provided by the university's network administrator. According to the university, it appears true that fewer students are using the high-speed Internet connections of the university to download data. However, there is a significant increase in broadband activity in regards to uploads. Because the university does not monitor the exact data traffic, it is impossible to explain how many users are affecting this spike in service (personal communication, December 5th, 2003). The increase is possibly due to inexperience with the software. Most, if not all, of the software programs allow users to designate portions of their computer as shared folders. In addition, users can preset the number of other users that can upload files at any given time. If left unmodified, the default value is to allow an infinite number of connections. Therefore, a relatively moderate amount of students (such as 23%, $n = 24$) who use the file sharing programs in their dorm rooms could potentially be responsible for this spike in bandwidth consumption.

DISCUSSION

While a notable majority of respondents would never consider stealing videos, compact discs or software from a retail store, fewer found the manufacturing of homemade copies to be illegal. Further, a large number of respondents indicated they did not find the sharing of files via peer-to-peer networks to be either unethical or equivalent to physical shoplifting. This is despite the fact that both activities result in copyrighted materials being obtained without payment for the materials. There are two possible explanations for why university students perceive file sharing they way they do. First, there is the possibility that individuals merely do not view the act as equivalent because there is no physical activity involved in the criminal act. The perceived anonymity associated with using the Internet and computers to share files, when combined with the fact that there is no physical removal of merchandise, could reduce a file sharer's fear of being caught. The act may therefore take on a less serious nature.

The second explanation, and perhaps the better of the two, involves Sykes' and Matza's techniques of rationalization and neutralization. According to Sykes and Matza (1957), relatively law abiding individuals can move between periods of legal behavior and periods of illegal behavior. "It is our argument that much delinquency is based on what is essentially an unrecognized extension of defenses to crimes, in the form of justifications for deviance that are seen as valid by the delinquent but not by the legal system or society at large." (p. 666) When these individuals drift between behaviors, it is normal for one of five excuses to be used to neutralize their guilt over their behavior: denial of victim, denial of injury, denial of responsibility, condemnation of condemners, and an appeal to higher authorities.

At first glance it would appear that two of the neutralizations could be used to explain attitudes related to file sharing. The first is the concept of denial of a victim. Smigel and Ross (1970) found in their assessment of Sykes and Matza's techniques that attacks against large companies are often easier to justify because these companies are often impersonal and appear more interested in profit than in their customer's needs. Here, students may realize that what they are doing is wrong, yet they continue to engage in the activity because they do not believe that the recording industry, or the musical artists, is being affected by their activities. It is

possible that file sharers could be rationalizing their behavior on the grounds that the RIAA and the musical artists have already made so much money off of their albums that they will not be affected by a few file sharers. Of course the problem with this argument would be that there are so many file sharers today, that the impact is greater than even file sharers themselves may realize.

The second technique of neutralization that could be used to explain the behavior of file sharers is that of denial of injury (Sykes & Matza, 1957).   Here, file sharers may realize that the RIAA and musical artists are being affected by their activities. However, file sharers may attempt to convince themselves that by file sharing they are learning more about the artists and their music, with the intention of buying more music in the future. In the comment sections of the survey instrument there were several respondents that indicated they only used file sharing programs to preview albums. The problem with these statements is that in reality, a low number of file sharers appear to ever purchase music CDs (Enos, 2000; Madden & Lenhart, 2003).

Differences in file sharing by gender

In examining perceptions of file sharing among gender, female respondents were generally less certain about the equality of physical shoplifting and peer-to-peer file sharing. A majority of male respondents was certain the act was not equivalent, while only a small number were uncertain about the equivalency of the two acts. However, female respondents were directly inversed with more responses of uncertainty and fewer responses that the act was not equivalent. Female respondents also were less certain about the ethics associated with sharing files via peer-to-peer networks, with a significant number of respondents not willing to make a statement indicating that the act was either ethical or non-ethical. In examining the frequency with which students share files via peer-to-peer networks, it was revealed that male respondents generally downloaded files at a greater rate than their female counterparts.

It is difficult to explain why female respondents were less certain about their perceptions of file sharing. While there have been numerous studies on delinquency, it has only been recently that these studies have included an examination of gender. It is still undetermined as to whether explanation of delinquency by females lies in the gender of the offender or in the historical view of females as more victim than perpetrator (Daly & Chesney-Lind, 1988). However, there is little consideration of technology and the impact technology has on the behavior of both males and females; a consideration that can certainly impact behaviors of both genders. Further research designed to test the role gender plays in the commission of technology-assisted crime is necessary.

Differences in file sharing by major

In considering major, it was revealed that there were few differences between responses when considering whether a respondent was a criminal justice major or a non criminal justice major. In fact, the only differences found related to whether respondents believed the sharing of files to be ethically wrong and whether respondents equated the acts of file sharing and physical shoplifting. Criminal justice majors were more certain that file sharing was not unethical, while non criminal justice majors were more uncertain about the ethical implications of file sharing.

Non criminal justice majors were also more uncertain about the equivalency of shoplifting and file sharing, while criminal justice majors were more certain that the two acts were not equivalent. Of course, little difference between major was expected by these authors; however, at the same time it is these individuals who may be asked to handle investigations of these types of crimes if, in fact, the criminal justice system is forced to one day handle these investigations. The question that will almost certainly arise is whether someone can truly investigate a crime for which they are themselves frequently committing?

File sharing activity

This study found that a majority of respondents did increase their peer-to-peer file sharing with the advent of broadband Internet connections. Once again, these results were not surprising to these authors. Utilizing narrowband Internet connections such as dial up modems would take 10 to 15 minutes to transfer musical files, so it is only reasonable to expect that faster Internet connections could result in increased amounts of file sharing. Additionally, subsequent releases of file sharing software have allowed for trading of movies and software that can both be large in file size. Absent the use of broadband Internet access, the downloading of these files could potentially take days to complete. If individuals are going to download files, and a majority of respondents did use the software, then it is only reasonable to expect individuals to look for the quickest and easiest method of trading the files.

University Internet access was found to be used by only a small percentage of those who used the peer-to-peer networking software. While at first glance it would seem that these results support the argument that universities have no obligation to prevent peer-to-peer file sharing, the reality is that if students are utilizing university services to engage in illegal activity, then a university-based program to make users more aware of the consequences of their actions could be justified. Further, the fact that 23% ($n = 24$) of those in the current study who shared files claimed to use university network services could be viewed as a justification for establishing such a course. Even this small amount of usage could impact the university's normal day-to-day network operations if the software is not properly configured.

The awareness program could consist of a course combined with additional topics to satisfy one hour of elective credit, and be required for all students who are entering the university. Along with covering the issue of peer-to-peer networking, this course could also introduce students to the various computing aspects of the university. The majority of universities now provide students with electronic mail (e-mail) addresses and computer labs for completing research assignments. The e-mail address could be assigned to the student during the course, and rules relating to the use of the computer labs could be addressed. The course would be of limited inconvenience for a university and would not require extensive meeting times, thereby resulting in minor inconvenience for an instructor. Prior to completing the course, participants could be asked to sign an informed consent form that indicates their understanding of punishments should they violate the university's acceptable computing policy.

Limitations

The current study was limited by several factors. First, there was the nature of the data collected by the survey instrument. The data collected was nominal in nature, and only allowed

respondents a limited range of responses (yes, no, and uncertain). These results are useful in providing an introductory examination of file sharing attitudes, but more research is necessary to fully understand how university students feel about the activity of file sharing. Second, the current study was not designed to gauge understanding of why some students engage in file sharing, while others choose to avoid file sharing. The initial results provided by this study indicate the possibility that Sykes and Matza's techniques of neutralization could be used to explain this phenomenon. More research designed to gauge the use of neutralization techniques by file sharers will allow for a better understanding of why individuals who would not engage in physical acts of theft will engage in acts of digital theft. Finally, the data for this survey was collected less than one month before the RIAA began utilizing lawsuits to dissuade file sharers. Initial reports are conflicting as to whether these lawsuits are discouraging file sharers. Collecting more data in the post-lawsuit era could aid in determining if the lawsuits have affected the attitudes of university students who engage in file sharing.

CONCLUSION

The results of this study have revealed that a majority of university students do in fact use peer-to-peer networking. The problem with curbing the use of the software is that few respondents perceive the use of the software as either unethical or illegal. Few respondents even perceive the copying of commercial software, videos and compact discs without the use of peer-to-peer software to be an unethical or illegal act. Interestingly, female respondents do appear to be more uncertain about the legality or ethics of violating copyright law, and as result, it appears that females use peer-to-peer file sharing at a slightly lower rate than their male counterparts. Perhaps these results could also be interpreted as proof that there is hope for solving the problems associated with those who violate copyright protections using peer-to-peer software through education and awareness training.

There is little doubt that peer-to-peer networking is a problem, and it is a problem that is too widespread for the criminal justice system to handle. The solution, however, should not involve allowing copyright owners the opportunity to attack users of the software, as this scenario will only erupt in a technological battle that will accomplish little. Solving the problem will require a combination of education and criminal justice enforcement. There needs to be some amount of criminal prosecution for those who are illegally sharing copyrighted materials, because failure to prosecute anyone is what could have led to the current scenario where few people perceive the use of the software to be illegal. Education, however, is more important to reducing the number of individuals who share digital media via peer-to-peer networks. Universities, while not appearing to provide the Internet connection for the majority of those who share files, are in a position to provide the necessary education to reduce the frequency of the software's use. By offering a short one-hour course that covers the ethics of file-sharing, and the illegality of sharing copyrighted materials, a percentage of those who did not believe the use of peer-to-peer software to be illegal or unethical might change their perception and reduce their use of the software. Education is the key to curbing this problem, and failure to acknowledge this may only result in wasted time and effort by those who seek to develop copyright protection software or legislation that cannot reasonably be enforced.

ENDNOTE

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REFERENCES

Berger, S. (2001). The use of the internet to 'share' copyrighted material and its effect on copyright law. *Journal of Legal Advocacy & Practice, 3,* 92-105.

Blackowicz, J. (2001). RIAA v. napster, defining copyright for the 21st century? *Boston University Journal of Science and Technology*, *7,* 182-193.

Carey, M., & Wall, D. (2001). MP3: The beat bytes back. *International Review of Law Computers & Technology, 15*, 35-58.

Carlson, S. (2001). Napster was nothing compared with this year's bandwidth problems. *Chronicle of Higher Education, 48,* a44-a45.

Carlson, S. (2003). Recording industry plans to accelerate complaints about illegal file sharing. *Chronicle of Higher Education*, *48,* a46.

Congressional Report. (2002). *Piracy of intellectual property on peer-to-peer networks*. Retrieved February 18, 2003, from http://commdocs.house.gov/committees/judiciary/hju81896.000/hju81896_0.HTM.

Daly, K., & Chesney-Lind, M. (1988). Feminism and criminology. *Justice Quarterly*, *5*, 497-535.

Enos, L. (2000). Study: File-sharing stalls net music sales. *Newsfactor Network*, Retrieved February 27, 2003, from http://www.newsfactor.com/perl/story/4704.htm,

Fazekas, C. (2002). *Vigilantes v. pirates: the rumble over peer-to-peer technology hits the house floor. Duke Law & Technology Review*, 20-31.

Gillen, M., & Garrity, B. (2000). Industry's anti-piracy efforts 'doomed to fail' says forester. *Billboard*, 112, 9-11.

Ginsburg, J. (2000). Copyright use and excuse on the internet. *Columbia VLA Journal of Law & the Arts*, *24,* 1-45.

Golangelo, A. (2002). Copyright infringement in the internet era: The challenge of mp3s. *Alberta Law Review*, *39,* 891-913.

Greene, S. (2001). Reconciling napster with the sony decision and recent amendments to copyright law. *American Business Law Journal, 39*, 57-98.

Jacover, A. (2002). I want my mp3! Creating a legal and practical scheme to combat copyright infringement on peer-to-peer internet applications. *Georgetown Law Journal*, *90,* 2207-2254.

Johnstone, D. (2001). The pirates are always with us: what can and cannot be done about unauthorized use of mp3 files on the internet. *Buffalo Intellectual Property Law Journal*, *1,* 122-145.

Kazaa (2003). *Kazaa file sharing program info*. Retrieved on March 5, 2003, from http://kazaa.com.

Lights! Camera! No profits! (2003). *Economist, 366*,11-12.

Madden, M. & Lenhart, A. (2003). *Pew internet project data memo.* Retrieved on January 5, 2004, from http://www.pewinternet.org/reports/pdfs/PIP_Copyright_Memo.pdf.

Masson, G. (2000). NetPD tracks file swapping on web. *Billboard, 112,* 8-10.

Ostrom, M. (2002). Digital copyright issue flares on campuses. *Mercury News*. Retrieved on December 5, 2003, from http://www.siliconvalley.com/mld/siliconvalley/4616327.htm.

Pitta, J. (2001). Digital frontier? *Forbes*, *167*, 60-62.

Recording Industry Association of America. (2003). *Recording industry begins suing P2P file shares who illegally offer copyrighted music online.* Retrieved on December 5, 2003, from http://www.riaa.com/news/newsletter/090802.asp.

Segaller, S. (1998). *Nerds 2.0.1: A brief history of the internet*. New York: T.V. Books L.L.C.

Smigel, E., & Ross, H. (Eds.). (1970). *Crimes against bureaucracy.* New York: Van Nostrand Reinhold.

Snider, M. (2002). *Cyber-turf law hinges on 'hack'*. Retrieved on February 27, 2003, from http://www.usatoday.com/tech/news/techpolicy/2002-09-25-hack_x.htm.

Sony Corporation of America v. Universal City Studios, Inc. (1984). 464 U.S. 417.

Sykes, G., & Matza, D. (1957). Techniques of neutralization: A theory of delinquency. *American Sociological Review, 22*, 664-670.

Zepeda, L. (2002). A&M records inc. v. Napster, Inc. *Berkeley Technology Law Journal, 17*, 71-91.