Exploring the Extent to Which the Utilization of Technology Has Facilitated the Increased Possession of Online Child Pornography over Time

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EXPLORING THE EXTENT TO WHICH THE UTILIZATION OF TECHNOLOGY HAS FACILITATED THE INCREASED POSSESSION OF ONLINE CHILD PORNOGRAPHY OVER TIME

A Thesis
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Abstract

The possession and distribution of online child pornography is a growingly pervasive problem and its pessimistic effects and dimensions are far-reaching in today’s society. With the steady increase in these types of offenses, it is pertinent that a better understanding of this heinous crime is addressed through various research endeavors. A research avenue significantly lacking in regard to these types of crimes is the extent to which the utilization of technology is further facilitating these types of crimes. Thus, it is the objective of the present study to specifically address these issues with its relationship to technology. In order to achieve this goal, a secondary data analysis was conducted using data from two prior studies with specific attention to the technological variables used by online sex offenders possessing or distributing child pornography. Conclusions of this study determined that technology does play a contributing role in the possession of increased amounts of child pornography over time. Specifically, hard drives, removable media, peer-to-peer, and encryption were all identified as having statistically significant relationships to either increased image/video amount or increased usage of that particular technology over time. This study concludes with policy implications and future research recommendations based on this study’s findings.
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CHAPTER I

Introduction

The advancement of the Internet has proved to be a convenient and useful portal in accessing information for users. Such uses of the Internet include multiple facets such as online shopping, communication, paying bills, social networking, and researching. While the conveniences paired with the technological advancement of the Internet are seemingly paramount, significant social problems exist associated with the online environment. The proliferation of the Internet has provided new opportunities for offenders to utilize this relatively unregulated environment to engage in criminal activities. Specifically, the online victimization of children through the distribution and possession of child pornography is a growingly pervasive problem. Given the far-reaching effects that the Internet has in facilitating the distribution of child pornography, this is an issue that deserves extensive attention.

Online sexual exploitation of children through means such as possessing, downloading, or distributing child pornography has recently gathered the attention of researchers (Babchishin, Hanson, & Hermann, 2011; Mitchell, Finkelhor, Jones, & Wolak, 2010; Mitchell, Finkelhor, & Wolak, 2005; Wortley & Smallbone, 2010) and law enforcement agencies alike. Such research endeavors show that the amount of child pornography possessors arrested each year is continually growing. Additionally, the advancement of technology has yielded opportunities for these types of offenders to store larger amounts of images, readily save and view videos, and encrypt these images to avoid the detection of law enforcement. With the proliferation of the distribution of online child pornography, there has been an increase in the use of peer-to-peer networks for accessing more extreme images, a larger amount of younger victims, and more
extreme images and videos depicting violence towards the adolescents (Wolak et al., 2005; Mitchell, Jones, Finkelhor, & Wolak, 2011). The utilization of online technologies such as chat rooms, private websites, and peer-to-peer networks “are being used daily by paedophiles to meet unsuspecting children” (Kierkegaard, 2008, p.41). The distribution of child pornography is one of the most common ways a child may be victimized online which can be largely attributed to technological advancements. Technology has helped to facilitate child pornography online by increasing the amount available to access online, allowing greater ease of distribution, providing greater ease of accessibility, promoting relative ease of undetected downloading, and facilitating greater anonymity of offenders. Technological advancements have also aided these online offenders to network among themselves, to groom victims in an attempt to make contact offenses, and to promote child tourism or child trafficking notions.

The purpose of this research endeavor was to explore the extent to which technology has facilitated the increase in online victimization of children through the possession and distribution of child pornography. Specifically, this research compared arrest records from the National Juvenile Online Victimization Study (N-JOV) from two points in time (2000 and 2006) and briefly analyzed whether there was a significant increase in offenses and whether such increases varied based upon the technological advancements available to the offenders. The data utilized for this research endeavor was obtained through the National Juvenile Online Victimization Study (N-JOV) and the Second National Juvenile Online Victimization Study (N-JOV2). While many prior studies have reexamined the data collected from both waves of the N-JOV studies, this research is unique to the extent that it exclusively looked at the correlation between technology and the increase of child pornography between two points in time (2000 and 2006).
The research questions for this study specifically relate to the type of technology used and their relationship with either an increase in usage over time or an increase in amount of child pornography stored. The specific technologies that were used within the present study include hard drives, removable media, remote storage, peer to peer networks, password protection, and encrypted files. Thus, it was the objective of the present research to attain a better understanding as to whether technology has facilitated an increased usage over time with larger amounts of stored child pornography.

It was the intent of this research endeavor to fully explore whether technology that is readily available and continually improving has greater facilitated the possession, distribution, and collection of online child pornography. Policy implications are discussed at the conclusion of this paper based on findings of the research. Additionally, suggested future research endeavors are also discussed at the conclusion based on the findings of this study.
CHAPTER II

REVIEW OF THE LITERATURE: ONLINE CHILD PORNOGRAPHY OFFENDERS

Before analyzing the extent to which technology has further facilitated increased dissemination and possession of online child pornography, it is first imperative to fully understand the concept of online child pornography. By obtaining a thorough understanding of the predominance of online child pornography possession and the extent of this problem, then it will be easier to assess the extent to which technology has facilitated an increase in this problem. This chapter will focus on the predominance of online child pornography, demographic and motivational characteristics of these offenders, and demographic characteristics of the victims. Additionally, this chapter will note the extent to which online child pornography has provided a platform for an emerging pedophilia subculture online.

Child Pornography Laws in the United States

The first federal law that specifically addressed child pornography was the Sexual Exploitation of Children Act in 1978 which specifically prohibited both the manufacture and the distribution of “obscene material” with minors under the age of 16 (Sexual Exploitation of Children Act, 1978). In New York v. Ferber, child pornography was found to not be protected by First Amendment rights and it was determined to be judged on a separate standard from obscenity laws (New York v. Ferber, 458 U.S. 747, 1982). In 1984, the age of a minor protected by child pornography legislation was raised from 16 to 18 (Child Protection Act 18 U.S.C. §§ 2251, 2252, et seq.). The Child Protection and Obscenity Enforcement Act of 1988 defined it as illegal to utilize a computer to depict or advertise child pornography (Child Protection and Obscenity Enforcement Act, amending §§ 2251, 2252). In 1990, Osborne v. Ohio found the private possession of child pornography to be illegal (Osborne v. Ohio, 495 U.S. 103, 1990).
Additionally, the Child Pornography Protection Act of 1996 determined virtual images of children to be included within the definition of child pornography (Child Pornography Protection Act (18 U.S.C. §§ 2252A, 2256(8))). Furthermore, 1998 witnessed a significant advancement when it was mandated by law for Internet Service Providers (ISPs) to report incidents of child pornography to authorities through the Child Protector and Sexual Predator Punishment Act (Child Protector and Sexual Predator Punishment Act (42 U.S.C. §§ 13032)). However, in *Ashcroft, v. Free Speech Coalition* virtual images were found to not constitute pornography; where the terminology “appear to be a minor” was ruled too broad (*Ashcroft v. Free Speech Coalition*, 535 U.S. 234, 2002).

Specific U.S. federal statutes define children as being under the age of 18; furthermore, these statues define child pornography as the “visual depiction, including any photograph, film, video, picture, or computer or computer-generated image or picture, whether made or produced by electronic, mechanical, or other means, of sexually explicit conduct” (18 USC Section, 2256, 2003). Sexually explicit conduct within the statute includes “sexual intercourse, bestiality, masturbation, sadistic or masochistic abuse, or lascivious exhibition of the genitals or pubic area of any person” (18 USC Section, 2256, 2003).

**Predominance of Online Child Pornography**

Online possessors of child pornography signify a steadily growing population that has gained continued attention from law enforcement and researchers. While the specific extent of this growing problem is difficult to pinpoint, all evidence directly points to a continually growing issue. At any given time, estimates suggest there to be over one million pornographic images of children located on the Internet, with approximately 200 new images posted daily (Burke,
Sowerbutts, Blundell, & Sherry, 2002). Some child pornography sites can receive up to a million hits a month (Jenkins, 2001). Additionally, the Internet Watch Foundation (IWF) identified websites containing criminal content, including abusive images of children, as rising by 78% between 2004 and 2005 (IWF, 2006).

In 2006, the Internet Filter Review (Ropelato, 2007) reported that there are approximately 100,000 websites that offer child pornography. Additionally, the same study found that a large peer-to-peer network, Gnutella, received 116,000 “child pornography” requests daily (Ropelato, 2007). Additionally, the National Center for Missing and Exploited Children (NCMEC) maintains a CyberTipline where individuals can report cyber-facilitated child pornography cases. There was a significant increase in cases reported over a five year period through NCMEC’s CyberTipline with 2003 receiving 7,038 tips and 2007 receiving 20,760 tips (U.S. Department of Justice Office of the Inspector General, 2009).

This increasingly relentless problem can directly be noted in the number of arrests for possession or distribution of child pornography (Wolak et al., 2005; Mitchell, Jones, Finkelhor, & Wolak, 2011). In 2000, there were approximately 1,713 offenders arrested for the possession or distribution of child pornography according to the National Juvenile Online Victimization Study (Wolak, Finkelhor, & Mitchell, 2005a). Yet in 2006, the same study saw an increase of more than double, witnessing a total of 3,672 arrests of individuals either possessing or distributing child pornography (Wolak, Finkelhor, & Mitchell, 2011). “The large increase in arrests for child pornography possession brings up the question of whether such material became more prevalent, easier to access, or used by a widening number of offenders between 2000 and 2006” (Wolak et al., 2011, p. 28).
In a third wave of the National Juvenile Online Victimization Study (N-JOV 3), which collected arrest data for child pornography offenders in 2009, the arrests for possession of child pornography continued to grow from 2006 to 2009 by one-third (Wolak, Finkelhor, & Mitchell, 2012). Specifically, arrests for child pornography possession in 2009 were 4,901, compared with 3,672 in 2006, and 1,713 in 2000 (Wolak et al., 2012). Additionally, 2009 witnessed a significant increase in the amount of offenders that utilized peer-to-peer technology to access contraband images, in comparison to the two prior N-JOV studies (Wolak et al., 2012). The growing number of arrests can be partially explained by the increased awareness of law enforcement to arrest individuals for child pornography possession. With increased arrests between 2000 and 2009, evidence points to law enforcement success with regard to arresting online offenders, predominantly by utilization of law enforcement undercover techniques (Wolak, Finkelhor, Mitchell, 2009). Furthermore, in comparison with 2000, conclusions from the 2006 survey revealed that there was greater success in prosecuting offenders (Wolak, Finkelhor, & Mitchell, 2011). Such success could be seen in more offenders being incarcerated in 2006, with comparison to those arrested in 2000 (Wolak, Finkelhor, & Mitchell, 2011). Additionally, those who were incarcerated in 2006 were sentenced to serve longer sentences than those in 2000 (Wolak, Finkelhor, & Mitchell, 2011).

**Demographic Characteristics of Online Sex Offenders**

While there is no specific profile available to determine who exactly constitutes an online child pornography offender, there has been extensive research to obtain a better understanding of the demographics of this growing population. To better comprehend the Internet sex offending arena as a whole, it is first pertinent to have a more thorough understanding of some characteristics of offenders driving this industry. A predominant amount
of literature has concluded these offenders to be primarily white, between the ages of 25 and 50, generally employed, and average to above-average intelligence (Bourke & Hernandez, 2009; Burke et al., 2002; Webb et al., 2007; Wolak, Finkelhor, & Mitchell, 2005). Some research has found these offenders to be in a relationship at the time of their offense (Burke et al., 2002). Yet other research endeavors have found the offenders to be single at the time of their offense: 48% of sample was single (Webb, Craissati, & Keen, 2007) and 41% of sample was single and had never been married at time of offense (Wolak, et al., 2005).

With respect to the 2000 and 2006 arrest records, Wolak et al. (2009) found 99% of offenders to be male. Of those males, 84 to 90 percent identified as White, non-Hispanic. With respect to offenders arrested in 2000, 9% of the individuals had been arrested prior for sex offenses against minors, with 2% of them being identified as registered sex offenders (Wolak et al., 2009). With regard to offenders arrested in 2006, 10% of the offenders had been previously arrested for sex crimes against minors, 4% of whom were registered sex offenders (Wolak et al., 2009). Additional studies have concluded similar findings, specifically that individuals accessing online child pornography are likely to be in a relationship, are probable to be employed, generally have an above average IQ, often have a college education, and are less likely to have a criminal record (Blundell, Sherry, Burke, & Sowerbutts, 2002; Schwartz & Southern, 2000). Furthermore, an additional study concluded a predominant amount of offenders are white, males between 26 and 40 with a heavy concentration of spending large amounts of time online (Blundell et al., 2002; Schneider, 2000).

With regard to individuals federally prosecuted in 2006 for possessing child pornography, 89% of arrestees were white, 99% were male, and 58% had some college education (Motivans & Kyckelhahn, 2007). Furthermore, the same study found that 80% of those arrested had no prior
felony convictions (Motivans & Kyckelhahn, 2007). Finally, the median age of those federally prosecuted in 2006 was 42 years old (Motivans & Kyckelhahn, 2007).

An additional study by Mitchell, Jones, Finkelhor, & Wolak (2011) found the following characteristics for offenders arrested in 2006 for Internet-facilitated commercial sexual exploitation of children (IF-CSEC): 99% were male, 47% were 40 or older, 84% were non-Hispanic White, 21% were married at occurrence of crime, and 69% were employed full-time. Additionally, it is interesting to note that in 27% of the cases, the offenders were acquaintances of the victims, while in 26% of the instances, the offenders had familial relationships with the victims.

**Motivations of Online Sex Offenders**

It is imperative to have a thorough understanding of what types of online offenders exist, and what their motivations entail. In their article, Beech, Elliott, Birgden, & Findlater (2008) identified three primary ways in which the utilization of the Internet for child sexual abuse are outlined: (1) dissemination of sexually abusive images of children for personal and/or commercial reasons; (2) communicating with other individuals with a sexual interest in children; and (3) maintaining and developing online pedophilic networks. Furthermore, the authors asserted Internet offenders fell into four categories: (1) ‘curious’ and impulsive users; (2) users accessing and trading images to fuel their sexual interests; (3) contact sexual offenders who also use child pornography; and (4) those who disseminate images for non-sexual reasons, such as financial gain (Beech, Elliott, Birgden, & Findlater, 2008).

In their study, Mitchell, Jones, Finkelhor, & Wolak (2011) classified online offenders associated with child pornography into two primary categories: (1) those who used the Internet to
purchase or sell access to identified children for sexual purposes including child pornography production (36% of cases), and (2) those who used the Internet to purchase or sell child pornography images they possessed but did not produce (64% of cases) (Mitchell et al., 2011). Generally, the primary types of online offenders are recognized as either individuals involved in the production of the child pornography or individuals implicated with the possession of child pornography.

One significant study conducted by Cooper (2002) addressed three basic elements of internet use that draws and motivates users to access child pornography online. What has been referred to as the “triple A engine” directs attention to three basic elements of internet use: accessibility, affordability, and anonymity (Cooper, 2002). Such easy access, simple storage means, free access to child pornography images, and accessibility from the privacy of one’s home all give way to easily accessing child pornography and satisfying the motivations of online sex offenders.

Lanning (2001) attempted to better understand the degrees of motivating factors faced by those who collect online child pornography. He describes the motivation to collect online child pornography as a continuum that extends from individuals who simply collect the child pornography to individuals who collect the material and subsequently kidnap children and sexually abuse them (Lanning, 2001). Other researchers have also found motivating factors to collect child pornography should be viewed along a continuum (Foley, 2002; Krone, 2004; Taylor, Quayle, & Holland. 2001). Based on such identified continuums, various researchers have subsequently proposed typologies for online sex offenders (Krone, 2004; Cooper, Putnam, Planchon, & Boies, 1999; Taylor, et al., 2001).
Proposed Typologies of Online Sex Offenders

Much research has been performed to address these types of offenders (Briggs, Simon, & Simonsen, 2011; Alexy, Burgess, & Baker, 2005; Krone, 2004; Cooper, et al., 1999). The primary question with these types of offenses pertains to whether this type of offense can be categorized with other sexual offenses, or whether an entirely new typology should be devoted to online sex offenders who distribute or possess online child pornography. The following section briefly discusses the research and typologies that have been proposed for this type of offender. It is pertinent to understand motivations and proposed typologies so as to have a thorough conception of these types of offenders.

Because the Internet allows individuals to carry out concealed thoughts and desires, there is a degree of anonymity to these types of offenses. Because of this, there is a varying extent as to the offenders’ level of interest in the child pornography. There is also a differing degree as to the level of severity of child pornography that these offenders are interested and attracted. Because of these varying levels of interest, Cooper et al. (1999) proposed a typology from a psychological perspective for Internet child pornography offenders. The three predominant user types are recreational users, at-risk users, and sexual compulsives (Cooper et al., 1999). Recreational users are individuals who access and view child pornography online out of impulse or curiosity; these types of individuals are not seen as long-term problems with online child pornography (Cooper et al., 1999). At-risk users are individuals who developed an interest in child pornography, most likely due to the fact that it was available on the Internet (Cooper et al., 1999). Sexual compulsives are individuals who already have an interest in “children as sexual objects” and actively search for online child pornography (Cooper et al., 1999).
Krone (2004) has provided one of the most extensive studies pertaining to child pornography offenders. His thorough research endeavors subsequently gave way to his proposed offending typology. Krone’s (2004) typology addressed the varying degrees to which offenders are involved in online child pornography, the varied levels of networking in which they converse with other online sex offenders, and the extent to which their behavior involves sexual abuse. The typology of offenders as proposed by Krone (2004) includes the following nine types: browser, private fantasy, trawler, non-secure collector, secure collector, groomer, physical abuser, producer, and distributor. The following section will explore the attributes of these previously mentioned typologies.

A browser is an individual who unintentionally stumbles across child pornography. The key however, is that this individual saves the content for access to it at a later time (Krone, 2004). An individual who has a private fantasy of having sex with a child has not directly committed an offense (Krone, 2004). However, if that private fantasy escalates to a representation of that fantasy by possessing child pornography for private use, then an offense has been made. A trawler is an individual that aggressively searches for child pornography (Krone, 2004). In the trawler’s case, the individual uses minimal security precautions. A non-secure collector actively purchases or exchanges child pornography through sources available online that generally do not enforce security dimensions (Krone, 2004). The primary difference in a non-secure collector is that there is an elevated level of networking between offenders, such as seen in p2p networks. The secure-collector utilizes security precautions in the collection process of child pornography (Krone, 2004). These collectors only seek pornographic material of children within secure networks. Aside of encryption mechanisms in place, some groups have minimum requirements that must be achieved before the individual can receive access to that
site. Some sites require submission of thousands of pictures before access is granted. However, individuals identified as secure-collectors are enticed to such groups due to the massive collections available once access is granted. The groomer is an individual that has contacted a child online with the intent of the relationship escalating to a sexual relationship, either via cybersex or physical sex (Krone, 2004). The physical abuser is aggressively involved in abusing children and using child pornography as an avenue to supplement their sexual yearning (Krone, 2004). The physical abuse may be recorded for the physical abusers’ purposes alone; it is not their intention to distribute the recorded physical abuse of children. The producer is responsible for recording sexual abuse of children and providing those images to other child pornography users (Krone, 2004). The distributor is responsible for distribution of child pornography at any one of the other levels (Krone, 2004). The distributor’s interests may not be in looking at child pornography; their interests may be for purely financial gain.

**Emergence of a Pedophile Subculture Online**

The Internet has provided a platform for individuals with common interests to come together and share those thoughts and interests. Specifically, the Internet has provided a place for people with sexual interests outside of society’s norms to intersect in the virtual word with associated anonymity and lack of judgment (Rosenmann & Safir, 2006). With common interests of users and a universal platform to exchange ideas and images through web forms, peer-to-peer networks, and newsgroups, the Internet has provided a mechanism for these types of people to interact and connect instantly and anonymously. The Internet has provided a place for these individuals to share their interests and create support for each other so that they legitimately feel “they are part of a group, from which validation can be drawn, and sexual scripts exchanged” (Rosenmann & Safir, 2006). As a result of such a platform online, subcultures have developed
within cyberspace that focuses on sexual deviance and crime (DiMarco & DiMarco, 2002; Quinn & Forsyth, 2005). Specifically, one of the most significant subcultures that has emerged online is that of pedophilia.

Research has suggested that the Internet is developing a subculture of pedophiles that subsequently fosters relationships and sexual interactions with children (Holt, Blevins, & Burket, 2010; Seto, Cantor, Blanchard, 2006). Pedophilia occurs when adults actively pursue sexual or emotional relationships with children and is debatably one of the most feared Internet related sex crimes (Jenkins, 2001). With the increased accessibility to collect and distribute child pornography online, pedophiles are able to utilize the Internet as a continued facilitation of this criminal behavior (Jenkins, 2001; Quayle & Taylor, 2002). Additionally, with the emergence of various communication mediums such as, chatrooms and Web forums, the Internet allows pedophiles to discuss their interests and gain acceptance within the pedophiliac environment. “These sites provide a way for pedophiles to come together to validate their sexual interests, share information about their habits, and find support for their behaviors” (Holt et al., 2010). Precautionary measures to consider with law enforcement, tips for removing data from hard drives, and justifications for “child love” are all provided to the members of such child pornography subcultures (Jenkins, 2001).

Holt, Blevins, & Burket (2010) explored subcultural norms within the pedophile community by analyzing 705 threads within five web Forums specifically for pedophiles. Web Forums are online discussion groups that allow individuals to discuss relevant topics or issues. The findings of this study suggested that the “values of the pedophile culture support and encourage emotional and, in some cases, sexual relationships with boys and girls in virtual and real settings” (Holt et al., 2010). The findings of this study revealed that the online social world
of pedophiles is contoured by the following four normative orders: marginalization, sexuality, law, and security (Holt et al., 2010). In terms of marginalization, users within the forums constantly conveyed the feeling that society as a whole constantly pushed pedophiles into the margins, or “fringes of society,” and they felt compelled to constantly defend themselves towards people that did not share similar sexual orientations. Thus, the Internet provided a platform through forums where these individuals that felt shunned by society could go and safely interact and converse with others who shared the same interests (Holt et al., 2010). After accepting the fact that society does not accept their type of behavior, pedophiles utilize Web forums as a safe avenue to discuss attractions and wishes within an online community of individuals sharing the same interests. This is where the sexuality dimension comes into play; the Internet provides a platform for these individuals to converse about their sexual preferences with children without fear of being judged or rejected (Holt et al., 2010). With respect to law, this “order emphasizes the influence of law in structuring the way that pedophiles relate to children” (Jenkins, 2001). These offenders use the Web forums to warn each other of relevant laws so as to avoid detection or arrest (Holt et al., 2010). Finally, the element of security is of great importance within the pedophile subculture. Users within these forums are often extremely careful as to what they write and often warn others to be cognizant as to what they say online and where they post comments to further deter detection (Holt et al., 2010).

Additional studies have directed attention to whether child pornography offenses are a reliable indicating factor of pedophilia (Seto et al., 2006). After a sexological assessment of 685 male patients between 1995 and 2004, child pornography offenders were identified as exemplifying greater sexual arousal to children than to adults (Seto et al., 2006). The results of this study identified child pornography offending as a “stronger diagnostic indicator of
pedophilia than is sexually offending against child victims” (Seto et al., 2006). Conclusions found child pornography offending to be a legitimate indicator of pedophilia.
CHAPTER III

REVIEW OF THE LITERATURE: TECHNOLOGY UTILIZED BY CHILD PORNOGRAPHY OFFENDERS

Technological Advancements Affecting Distribution of Child Pornography

There is no doubt that the Internet and advancing technology has played a significant role in promoting child pornography. In fact the Internet has been identified as escalating the issue of child pornography by “increasing the amount of material available, the efficiency of its distribution, and the ease of accessibility” (Wortley & Smallbone, 2006, p. 9). Specifically the Internet has been identified as promoting child pornography in the following ways: “permits access to vast quantities of pornographic images from around the world; makes pornography instantly available at any time or place; allows pornography to be accessed (apparently) anonymously and privately; facilitates direct communication and image sharing among users; delivers pornography relatively inexpensively; provides images that are of high digital quality, do not deteriorate, and can be conveniently stored; provides for a variety of formats (pictures, videos, sounds), as well as the potential for real-time and interactive experiences; and permits access to digital images that have been modified to create composite or virtual images (morphing),” (Wortley & Smallbone, 2006, p. 9).

In 2011, Wolak, Finkelhor, & Mitchell attempted to better understand various trends in cases involving possession of child pornography that resulted in arrest during 2000 and 2006. The purpose of their study was to attain a national representation of Internet-related child sexual exploitation cases which focused on child pornography and ultimately resulted in the offender’s arrest. In order to analyze such trends, the authors utilized data from the National Juvenile
Online Victimization Study which was a national sample survey of 2,574 in 2000 and 2,598 in 2006 law enforcement agencies in the United States. In both waves (2000 and 2006), the researchers contacted the various agencies in an attempt to understand whether they had made child pornography related arrests within the past year. If so, the agency was then contacted in a phone interview to obtain details of the specific cases. Results of comparing these studies revealed significant findings, including the diverse ways in which offenders collect and distribute child pornography.

Advancements in technology have significantly aided offenders in both, easier access to and distribution of child pornography. First, the availability and storage capacity of computer hard drives and flash drives devices make storing child pornography images relatively effortless. It is no wonder why these variations of media storage were used in most cases pertaining to the retrieval of child pornographic images (Wolak et al., 2011).

Second, the technological advancement of peer-to-peer (p2p) file sharing networks presents a substantial problem as it allows users to access and download files from individual computers, as opposed to the traditional route of accessing centralized servers. Such p2p networks allow a higher proportion of offenders to have access to child pornography (Wolak et al., 2011). Additionally, Wolak & associates (2011) identified offenders that utilized p2p networks as often having both larger amounts of images on their computers (more than 1,000 still images and child pornographic videos) as well as more extreme images of victims showing sexual penetration and violence (Wolak et al., 2011). Specifically, offenders arrested in 2006 identified as using p2p networks for child pornographic images were more likely to possess images depicting children under the age of 3 and images portraying both penetration and violence to the victim (Wolak et al., 2011).
By maintaining a sense of anonymity, these types of offenders believe that they will not be caught for their actions considering they are committing these acts within the privacy of their own homes. However, individuals are progressively beginning to employ tools that enhance their anonymity and further protect detection from law enforcement. The third dimension involves the extent to which child pornography offenders have used technological advancements that provide them the ability to hide images to avoid any detection from law enforcement or others. Specifically, of child pornography offenders arrested in both 2000 and 2006, 1 in 5 (20 percent) utilized technological processes to hide the images (Wolak et al., 2011). These methods include password protection, encryption, and steganography. The most common tool was password protection, with the other two utilized less widely.

Additionally, varying technological advances has made the integration of utilizing the Internet of great benefit to offenders. Mitchell et al. (2011), identified four predominant ways pertaining to why offenders quickly adopt the Internet with relation to their child pornography offending. First, the Internet provides an avenue to advertise and promote prostitution via escort services or massage parlors through various websites including Craig’s List and Backpage. Such advertisements can easily advertise young girls and boys. Second, the Internet offers the ability to reach diverse audiences worldwide. Such audiences can include groups that may focus on the exploitation of young children, such as, international traffickers, pedophiles, or individuals concerned specifically with child pornography. Third, online sex offenders often believe that their inappropriate activities on the Internet can be sufficiently hidden through utilization of encryption. Finally, the online realm makes connections between other offenders of the same interest more easily obtainable. Such connections can be seen through networking or within child pornography rings (Holt, Blevins, & Burket, 2010).
This chapter will review literature concerning predominant ways in which technology has played a role in child pornography online. Specifically, the three primary technological dimensions being proposed within this paper that are further facilitating increased child pornography include: storage, exchange, and anonymity. Within the storage category, the increased amount of child pornography available will be discussed, as well as the enhanced storage capacities available to offenders. Within the exchange dimension, accessibility, downloading, and distribution will all constitute improved technological techniques for the exchange of child pornography. Finally, the concept of anonymity will be discussed and the extent to which its role plays in the increased amount of online child pornography.

**Storage of Online Child Pornography**

**Increased Amount of Child Pornography Available.** There is no doubt that with the advent of the Internet came an exponential growth of child pornography available. The introduction of Internet technology lessened the cost of producing child pornography and significantly increased the amount available (Adler, 2008; Taylor & Quayle, 2003). On May 19, 2011, Attorney General Eric Holder Jr. so adequately stated the pervasive problem of increased availability of child pornography online at the National Strategy Conference on Combating Child Exploitation, “Unfortunately, we’ve also seen a historic rise in the distribution of child pornography, in the number of images being shared online, and in the level of violence associated with child exploitation and sexual abuse crimes. Tragically, the only place we’ve seen a decrease is in the age of victims. This is- quite simply- unacceptable.”

Prior to the Internet, there were approximately 250 child pornography magazines in circulation within the United States in 1977 (Wortley & Smallbone, 2010). During this time
period, law enforcement had significant success in reducing the distribution of such hard-copy magazines (Wortley & Smallbone, 2010). There were significant drawbacks to producing and reproducing child pornography, primarily due to the fact that it was expensive and quite difficult (U.S. Department of Justice, 2013). Furthermore, anonymous distribution was impossible by these types of offenders, and interaction between pedophiles was extremely difficult (U.S. Department of Justice, 2013). Due to the risks associated with purchasing child pornography during this time period, these types of offenders often became lonely and opted to pursue individuals instead (U.S. Department of Justice, 2013).

While there were many positive dimensions associated with the advent of the Internet, unfortunately the child pornography industry exploded due to the availability of child pornography images online (U.S. Department of Justice, 2013). The introduction of the Internet in the 1980s “dramatically changed the scale and nature of the child pornography problem, and has required new approaches to investigation and control,” (Wortley & Smallbone, 2010, p. 5). The Internet has been identified as escalating “the problem of child pornography by increasing the amount of material available” (Wortley & Smallbone, 2010, p. 9). The Internet provided a platform for child pornographers to “create, access, and share” child pornography within the privacy of their own home (U.S. Department of Justice, 2013). It also provided an avenue for these individuals to express their common interests, goals, and fantasies, while “normalizing their interest in children and desensitizing them to the physical and psychological damages inflicted on child victims” (U.S. Department of Justice, 2013).

While it is nearly impossible to precisely estimate the amount of child pornography currently available online, all evidence directs attention to it being a major, growing problem (Wortley & Smallbone, 2006; Jenkins, 2001). At any given time, estimates suggest there to be
over one million pornographic images of children located on the Internet, with approximately 200 new images posted daily (Wortley & Smallbone, 2006). Some child pornography sites can receive up to a million hits a month (Jenkins, 2001). Internet Service Providers (ISPs) have also provided data concerning the amount of users attempting to access child pornography that they block. In fact, Norwegian ISPs have identified blocking access to as many as 15,000-18,000 daily requests to access known sites for carrying abusive child images (Quayle, Loof, & Palmer, 2008). Additionally, the Internet Watch Foundation (IWF) identified websites containing criminal content, including abusive images of children, as rising by 78% between 2004 and 2005 (IWF, 2006). One significant problem in estimating a precise number of sites “is that many exist only for a brief period before they are shut down, and much of the trade in child pornography takes place at hidden levels on the Internet,” (Wortley & Smallbone, 2010, p. 12).

**Storage Capabilities for Child Pornography.** With the increased amount of child pornography available online, there are also technological advancements that have supplemented for increased storage capabilities. Such technologies with storage capabilities include hard drives, removable media, and remote storage. These three storage variables all relate to ease of storage and are all three independent variables within this study.

Hard drives within laptops and desktops have continually expanded in storage capacity and speed throughout the years. The initiation of new storage technologies, as well as the continued demand for increased storage capacity has resulted in a surge in the size of hard drives (McKemmish, 1999). This increase in storage capacity has directly affected the amount of data people are capable of storing on their computers (McKemmish, 1999). With regard to child pornography, this significant increase in storage capacity has resulted in users downloading and
storing vast amounts of child pornographic images and videos without compromising the quality of the data.

Removable media devices include optical discs (blue-ray discs, DVDs, CDs), memory cards, floppy disks/zip disks, and magnetic tapes. Remote storage devices can store larger amounts of data and include USB flash drives and external hard disk drives. Both removable media devices and remote storage devices have improved technological capabilities and provide relatively large storage capacities. With such devices, it is easily attainable to inexpensively purchase infinite amounts of data storage capacity and store endless amounts of child pornography.

With available storage devices, individuals can easily download large amounts of image files. Subsequently, these digital files “can then be reproduced easily without compromising the quality of the image” (Beech, Elliot, Birgden, & Findlater, 2008, p. 219). Oftentimes, these offenders are utilizing a variety of storage techniques in attempts to organize or increase their child pornography collections. In fact, Carr (2004) found that in his sample, 86% of the sample had stored their images on a hard drive, with 29% also utilizing floppy disks and 14% using CD-ROMs.

Exchange of Child Pornography Online

Ease of Accessibility to Child Pornography. While child pornography did exist prior to the introduction of the Internet, it was much more difficult to access and attain. Yet, with the initiation of the Internet came an abundance of easily accessible sexual material, including child pornography (Quayle et al., 2008). The Internet provides a platform for individuals to find material no matter what their interests or tendencies entail (Taylor et al., 2003). A number of
dimensions have been identified which promote the notion of accessing child pornography online: anyone can access it, most images are free, images and videos can be viewed and stored, and they can all be accessed from the comfort of one’s home (Webb, Craissati, Keen, 2007). Such ease of accessibility was identified by Cooper (2002) as one of three primary factors that attracts millions of users to pornography online (remaining two are affordability and anonymity).

For individuals to access child pornography, it is normally something that must be actively sought after and not accidentally discovered. In fact, “it has been argued that genuine child pornography is relatively rare in open areas of the Internet, and, increasingly, those seeking to find images need good computer skills and inside knowledge of where to look,” (Wortley & Smallhouse, 2010, p. 10). Yet once these individuals understand where to look and how to access child pornography, there is a relatively endless supply that can be accessed with virtual ease.

There are also pedophile groups that often times have vast supplies of images and videos. Access to such pedophile groups are actually closed to the public and require membership in order to access the large amounts of images (Wortley & Smallhouse, 2010). Oftentimes, access to such groups requires either payment or the user must contribute their pornographic collection to the group. This exchange of images/videos promotes trust among the users, builds relationships due to common pedophiliac interests, and expands the users’ collection of images.

**Ease of Downloading Child Pornography.** Downloading directly involves accessing child pornography, either images or videos, through the Internet. Downloading child pornography involves viewing the images and subsequently storing them to either a hard drive or removable disk (such as a floppy, CD-ROM, external hard drive, or flash drive). Once individuals have access to the pornographic images, then it is relatively easy to download and
store as many images as desired. With relatively infinite storage capacity available to individuals, it is not difficult to store vast amounts of images and/or videos on storage devices. Additionally, “these digital data files can then be reproduced endlessly without compromising the quality of the image,” (Beech et al., 2008, p. 219).

Once downloaded, some individuals take precautionary measures to avoid detection by utilizing technological advances to hide their pornographic collections. In their study, Wolak et al. (2005) found 20% of their sample to utilize measures such as password protection (17%), encryption (6%), file servers (4%), evidence-eliminating software (3%), remote storage systems (2%), and partitioned drives (2%), in an attempt to hide images and/or videos on their computer.

The act of downloading gives the user the ability to later access those images or videos whenever desired and has been debated as a precursor to contact offenses. Quayle & Taylor (2002) and Sullivan & Beech (2003) both suggested that Internet child pornography use can escalate to committing a contact sex offense through the process of various acts including downloading images. Additionally, for individuals who continually download extensive amounts of child pornography, Lanning (2001) suggested that abusive images that were download may be used to “desensitize” an offender prior to or during the commission of an offense.

**Ease of Distribution of Child Pornography.** Distribution of child pornography encompasses both uploading and disseminating child pornographic images and videos. Individuals involved in distributing child pornography can span from amateurs to organized crime groups and pedophile rings (Wortley & Smallbone, 2010). With regard to those in organized crime groups, monetary profit is often the motivating factor (Wortley & Smallbone, 2010). Krone (2004) suggested a typology of Internet offenders, one of which being termed
Distributor. In Krone’s (2004) definition, the distributor of the child pornography may or may not have a sexual interest in children; however, the distributor often possesses child pornography with intent to sell and make a profit. With regard to pedophile rings, further contacts and support is often the contributing motive (Wortley & Smallbone, 2010). Many scenarios that involve amateurs do not even seek financial compensation. While the motives for distributing child pornography are wide and varied, the ease to distribute such images and/or videos are relatively easy given vast technological advancements.

Distribution of child pornography through the Internet can transpire through utilization of many different platforms. Options for dissemination include websites, web cam, e-mail, messaging, bulletin boards, chat rooms, and peer-to-peer (P2P) networks (Wortley & Smallbone, 2010). Even though law enforcement has made attempts to curb this problem by either terminating websites or catching offenders in sting operations, child pornography distributors are now “employing more sophisticated security measures to elude detection and are being driven to hidden levels of the Internet,” (Wortley & Smallhouse, 2010, p. 10).

Exchange Associated with Online Child Pornography. Ease of distribution, ease of accessibility, and ease of downloading child pornography can all be depicted as the exchange of child pornography. A primary platform that has facilitated increases in exchange of child pornography is P2P networks. P2P networks allow file sharing among users. While P2P networks are widely utilized for sharing other media types, such as songs and videos, P2P networks have gained significant attention by child pornographers in exchanging child pornography (Wortley & Smallbone, 2010). These networks also allow closed groups to trade images (Wortley & Smallbone, 2010). Thus, for this research, P2P is the primary variable measuring exchange of child pornography.
Greater Anonymity for Online Offenders

The online environment provides individuals with the capability to remain relatively anonymous, differing significantly from real-world interactions. This anonymity has provided individuals with a platform in which they perceive their actions to be anonymous. This has resulted in a feeling that their actions go unnoticed or undetected by law enforcement. This sense of feeling anonymous results in individuals committing cybercrimes due to the perceived notion that they will not be detected. This perceived feeling of anonymity extends to individuals committing many types of cybercrimes, including the possession and/or distribution of online child pornography. The computer has provided a sense of “anonymity and protection not afforded in face-to-face encounters” (Hundersmarck, Durkin, & Delong, 2007, p. 264). Furthermore, “the anonymity provided by the lack of face-to-face communication on the Internet may function to lessen social risk and will have a powerful disinhibiting effect on users” (Morahan-Martin & Schumacher, 2000). Additionally, the anonymity granted by the Internet to these types of offenders allows them to “merely borrow computers or choose different login names” to further enhance the feeling on anonymity and to avoid detection from law enforcement (Wynton, 2010, p. 1901). This perceived sense of anonymity has further facilitated potential for criminal behavior online, particularly regarding online child pornography.

Anonymity associated with the Internet not only allows oneself to attempt to remain anonymous by feeling as though they are hidden, but also grants one the potential pleasure of playing a role of someone else (Chou & Hsiao, 2000). These offenders feel that there are operating with a degree of anonymity and are thus more inclined to distribute child pornography, communicate with several children simultaneously, and utilize multiple fictitious profiles (Britts et al., 2011). Such anonymity associated with online activity allows these individuals to not only
access this illicit material, but to also engage in online predatory behavior (Bourke & Hernandez, 2009). Whether dealing with individuals that engage in pedophiliac behaviors in real life, or considering individuals that are exploring the notion of these sexual fantasies, the anonymity provided by the Internet provides a platform for individuals to explore or engage in this criminal activity with the notion of feeling anonymous (Bourke & Hernandez, 2009).

**Anonymity Associated with Online Child Pornography.** Encryption and password protection can represent efforts made by online sex offenders to further maintain a sense of anonymity. Encryption involves the process of encoding messages in a way that the general public cannot view the messages, but authorized parties can view what is composed within the message (Goldreich, 2004). An encryption key is used to encrypt the message, which essentially determines how exactly the message will be encoded. In order to decode the message, a decryption algorithm must be used by an authorized party. Utilization of encryption has gained momentum within the possession and distribution realm of online child pornography, especially among collectors of child pornography (Krone, 2004). Password protection allows users to protect their data by assigning it with a specified password. Access to such data is denied unless the predetermined password is given. Both encryption and password protection depict primary platforms that have facilitated attempts to avoid detection in accessing and storing online child pornography. Thus, for this research, encryption and password protection will be the primary independent variables measuring anonymity.

**Research Hypotheses**

Based on the literature review, the following hypotheses will be used within the present study to measure the extent to which technology has further facilitated increased amounts of
child pornography over time. The hypotheses are categorized based on the measurement of storage, exchange, and anonymity.

The following research hypotheses specifically relate to the ease of storage: hard drives, removable media, and remote storage. These variables will all be utilized in assessing whether they directly correlate with increased amounts of child pornography between 2000 and 2006.

It is hypothesized that between 2000 and 2006, utilization of hard drives are likely to be used to a greater extent in storing increased amounts of child pornography images and videos. This is hypothesized considering that increase in storage capacity by hard drives has directly affected the amount of data people are capable of storing on their computers (McKemmish, 1999). With regard to child pornography, this significant increase in storage capacity has resulted in users downloading and storing vast amounts of child pornographic images and videos without compromising the quality of the data. Thus the relationship between hard drives and increased amounts of child pornography over time will be examined within the present study.

\[ H1: \text{Between 2000 and 2006, it is more likely that hard drives will be utilized to a greater extent to store increased amounts of images depicting child pornography.} \]

\[ H2: \text{Between 2000 and 2006, it is more likely that hard drives will be utilized to a greater extent to store increased amounts of digital videos depicting child pornography.} \]

It is hypothesized that between 2000 and 2006, utilization of removable media is likely to be used to a greater extent in storing increased amounts of child pornography images and videos. This is hypothesized considering that removable media devices have improved technological capabilities and provide relatively large storage capacities. With such devices, it is easily attainable to inexpensively purchase infinite amounts of data storage capacity and store endless amounts of child pornography. Thus the relationship between removable media and increased amounts of child pornography over time will be examined within the present study.


**H3:** Between 2000 and 2006, it is more likely that removable media will be utilized to a greater extent to store increased amounts of images depicting child pornography.

**H4:** Between 2000 and 2006, it is more likely that removable media will be utilized to a greater extent to store increased amounts of digital videos depicting child pornography.

It is hypothesized that between 2000 and 2006, utilization of remote storage is likely to be used to a greater extent in storing increased amounts of child pornography images and videos. This is hypothesized considering with remote storage, individuals can easily download and remotely store large amounts of image and video files. Subsequently, these digital files “can then be reproduced easily without compromising the quality of the image” (Beech, Elliot, Birgden, & Findlater, 2008, p. 219). Thus the relationship between remote storage and increased amounts of child pornography over time will be examined within the present study.

**H5:** Between 2000 and 2006, it is more likely that remote storage will be utilized to a greater extent to store increased amounts of images depicting child pornography.

**H6:** Between 2000 and 2006, it is more likely that remote storage will be utilized to a greater extent to store increased amounts of digital videos depicting child pornography.

The following research hypotheses specifically relate to the exchange of online child pornography. Specifically, the independent variable, P2P, will be utilized in assessing whether there is a direct correlation with increased amounts of child pornography between 2000 and 2006. P2P networks have gained significant attention by child pornographers in exchanging child pornography (Wortley & Smallbone, 2010). These networks also allow closed groups to trade images (Wortley & Smallbone, 2010). Thus, it is hypothesized that between 2000 and 2006, P2P networks will more likely be utilized to a greater extent to access, download, and/or distribute child pornography.
H7: Between 2000 and 2006, it is more likely that peer to peer networks will be utilized to a greater extent to access increased amounts of images depicting child pornography.

H8: Between 2000 and 2006, it is more likely that peer to peer networks will be utilized to a greater extent to access increased amounts of digital videos depicting child pornography.

The following research hypotheses specifically relate to the anonymity associated with possessing or distributing online child pornography. Both independent variables: password protection and encryption, directly relate to the feeling of anonymity.

Specifically, the independent variable, password protection, will be utilized in assessing whether there is a direct correlation with increased amounts of child pornography between 2000 and 2006. Password protection is a primary platform that has facilitated attempts to avoid detection in accessing and storing online child pornography. Thus, it is hypothesized that between 2000 and 2006, password protection will more likely be utilized to a greater extent to hide increased amounts of child pornography.

H9: Between 2000 and 2006, it is more likely that password protection will be utilized to a greater extent to hide increased amounts of images depicting child pornography.

H10: Between 2000 and 2006, it is more likely that password protection will be utilized to a greater extent to hide increased amounts of digital videos depicting child pornography.

The independent variable, encryption, will be utilized in assessing whether there is a direct correlation with increased amounts of child pornography between 2000 and 2006. Utilization of encryption has gained momentum within the possession and distribution realm of online child pornography, especially among collectors of child pornography (Krone, 2004). Thus, it is hypothesized that between 2000 and 2006, encryption will more likely be utilized to a greater extent to hide increased amounts of child pornography.
**H11:** Between 2000 and 2006, it is more likely that encrypted files will be utilized to a greater extent to restrict access to increased amounts of images depicting child pornography.

**H12:** Between 2000 and 2006, it is more likely that encrypted files will be utilized to a greater extent to restrict access to increased amounts of digital videos depicting child pornography.
CHAPTER IV

Methodology

Research Design

In order to examine the extent to which technology has facilitated online child pornography, a secondary data analysis was utilized as the primary research design. Specifically, a secondary data analysis was conducted on two National Juvenile Online Victimization (N-JOV) studies. The primary objective of the N-JOV studies was to determine total arrests for Internet-related sex crimes against children (Wolak et al., 2005; Mitchell, Jones, Finkelhor, & Wolak, 2011). Specifically, the studies focused on obtaining a national representative sample of arrested offenders for the possession of child pornography (Wolak et al., 2005; Mitchell et al., 2011). The N-JOV studies attempted to gain a more comprehensive understanding of the characteristics of these types of offenders, the uniqueness of the crimes they commit, and a thorough understanding of the victims within these situations (Wolak et al., 2005; Mitchell et al., 2011). This design will specifically focus on the N-JOV 2000 study; one conducted between July 1, 2000 and June 30, 2001 (Wolak et al., 2005) and the N-JOV 2006 study from January 1, 2006 and December 31, 2006 (Mitchell et al., 2011).

Secondary Data Analysis of N-JOV Studies

Secondary data analysis is the examination of data collected by another other than the user. With regards to this research, the primary dataset analyzed was originally collected within the N-JOV studies. Thus, with regards to this research, the data that was analyzed is secondary data since it was not originally collected for this particular study.
There are significant benefits in conducting a secondary content analysis of the N-JOV studies. A paramount advantage to utilizing secondary data analysis is that the data can be readily available. Many high-quality datasets are stored and readily available for researchers to access. Because they are readily available and relatively easy to access, this heavily assists with time constraints. With regard to the N-JOV datasets, they have been archived and require permission from Cornell University to access them. Once access is granted, the original datasets are sent to the requesting individual at no cost.

An additional advantage in utilizing these previously collected dataset is that it accounts for a nationally representative sample. Such a large amount of data would be hardly attainable for an individual researcher. Due to hypotheses within this present study, a national representative sample would be the most beneficial in obtaining a thorough understanding of these types of online offenders and their use of technology with these types of offenses. Limitations to certain areas, whether rural or urban, could provide contrasting results on possession or distribution of child pornography and technological use. Thus, a nationally representative sample would be extremely beneficial for this research endeavor.

A third significant benefit of utilizing secondary data analysis directly relates to finances. Due to time and resources available, personally attaining a nationally representative sample would not be possible. Utilizing these datasets will save a significant amount of cost and time. Because of financial and time constraints, and because of access to the N-JOV datasets, utilization of the original datasets for secondary data analysis could prove to be extremely beneficial.
A fourth benefit involves the fact that this study was conducted by renowned researchers within this field, Janis Wolak, Kimberly J. Mitchell, David Finkelhor, and Lisa M. Jones. These individuals are known for their extensive depth of knowledge pertaining to this subject matter. With their extensive backgrounds in this field, it is hoped that the integrity and validity of their work will be depicted in the N-JOV datasets. Furthermore, both N-JOV datasets have been used as secondary datasets for a number of additional studies (Babchishin, Hanson, & Hermann, 2011; Mitchell, Finkelhor, Jones, & Wolak, 2010; Mitchell, Finkelhor, & Wolak, 2005; Mitchell, Jones, Finkelhor, & Wolak, 2011; Mitchell, Wolak, & Finkelhor, 2005; Mitchell, Wolak, & Finkelhor, 2009; Skeele & Collins, 2007; Walsh & Wolak, 2005; Wells, Finkelhor, Wolak, & Mitchell, 2004; Wells, Finkelhor, Wolak, & Mitchell, 2007; Wolak, Finkelhor, & Mitchell, 2004; Wolak, Finkelhor, & Mitchell, 2009; Wolak, Finkelhor, & Mitchell, 2011; Wolak, Finkelhor, & Mitchell, 2005; Wolak, Finkelhor, & Mitchell, 2009; Wolak, Finkelhor, Mitchell, & Jones, 2011; Wolak, Finkelhor, Mitchell, & Ybarra, 2008; Wolak, Mitchell, & Finkelhor, 2003; Wolak, Mitchell, & Finkelhor, 2003) thus instituting a sense of reliability within these resources.

Finally, specifically pertaining to the research question sought after in the present study, the N-JOV studies are the only data sources available that directly relate to the present research question. Specifically, the N-JOV studies are the only ones that specifically address online child pornography offenders and also include technology related questions. Because the N-JOV studies include variables relating to technologies utilized by offenders, these datasets are applicable and relevant to the hypotheses within the present study.

While there are numerous advantages to employing secondary data analysis, there are also a number of disadvantages. Arguably the most significant disadvantage is that data analysis
is the secondary data resource and may not specifically pertain to the new research endeavor. This brings the question of validity into the equation. Since N-JOV was conducted with certain research aspirations in mind, there is no guarantee that the datasets will be entirely appropriate for my specified research interests. Such limitations can restrain or alter the original research endeavor and may have to be modified to pertain to the data that had been previously collected.

A second disadvantage of using secondary data analysis is that variables used within the original study may have been categorized or defined differently than those identified for the new study. This may restrict the new research endeavor in terms of independent and dependent variables used, or the way variables had been previously defined. This can also be time consuming and requires strict adherence to assuring the validity and integrity of the data is not lost. This also relates to the possibility that variables that could be pertinent the current study may have not been measured within the original study. It is unlikely that all variables within the current study were measured in the precise manner used during the original study. Such limitations result in having to recode variables, modify variables, or exclude variables that would have been included otherwise if not utilizing secondary data analysis.

A third disadvantage is the uncertainty in knowing the integrity and reliability in which the original study was conducted. In analyzing secondary data sources, the new researcher is unable to determine the preciseness of the previous data collection process, as well as the integrity in which it was completed. Uncertainty pertaining to the methods of the original data collection and the integrity associated with such data collection proves significant.
A final disadvantage is that all limitations of the original study become restrictions within the new study. Specific limitations of the N-JOV studies will be duly discussed in the next section.

Despite disadvantages associated with secondary data analysis, it is believed that within this specific research endeavor, the advantages outweigh the cons. This is primarily due to the fact that all proposed hypotheses within this study appear to be addressed with variables in the original N-JOV studies. Thus, after careful consideration, it was determined that secondary data analysis of both the 2000 N-JOV study and the 2006 N-JOV study would be most beneficial for the current research endeavor. Thus, the next section is devoted to duly discussing both the 2000 N-JOV and 2006 N-JOV datasets.

**Research Instrument**

**National Juvenile Online Victimization Study (2000).** The first N-JOV study was conducted between July 1, 2000 and June 30, 2001 (Wolak et al., 2005). It was performed by the Crimes against Children Research Center at the University of New Hampshire under the direction of Drs. Wolak, Finkelhor, and Mitchell. Funding was through grants received from the National Center for Missing and Exploited Children and the Office of Juvenile Justice and Delinquency Prevention. The study itself collected data from law enforcement agencies nationwide in an attempt to better understand the qualities of Internet sex crimes against juveniles, specifically child pornography possessors, and the subsequent number of arrests for these specific crimes during a one-year time period.

A two-phase process was utilized to collect data from law enforcement agencies at the local, county, state, and federal levels. The first phase consisted of a mail survey sent to a
national-representative sample of law enforcement agencies concerning whether such agencies had made any Internet-related child pornography or sexual exploitation arrests between July 1, 2000 and June 30, 2001. The second phase entailed phone interviews with the investigators of the law enforcement agencies concerning a sample of the cases previously reported within the mail survey of the first phase. At the conclusion of both phases, the final dataset included data from 612 interviews. Sampling procedures used within the N-JOV are outlined below.

**Sample.** Within the first phase of the N-JOV study, a total 2,574 local, county, and state law enforcement agencies were mailed surveys to constitute a nationally representative sample. The 2,574 \((n)\) total agencies in the sample represented 17% of the total law enforcement agencies in population (15,329). Of the 2,574 agencies that had surveys mailed to them, 2,205 \((88\%)\) agencies responded to the mail survey, as well as two federal agencies. Responses resulted in a total of 1,713 cases pertaining to Internet sex crimes against minors were reported.

The researchers then designed a sampling procedure for further telephone interviews that took into consideration the total number of cases the agency reported. If the agency identified one to three cases total \((85\%\) of cases), then follow-up interviews were conducted for every case. If the agency reported more than three cases \((15\%\) of cases), then interviews were conducted for all cases specifically involving identified victims, and sampled other cases. At the conclusion of both phases, the final data set included data from 612 completed interviews.

It should also be noted that certain criteria were required for eligibility within the N-JOV study. To be eligible, the case had to be a sex crime, have a victim under the age of 18, involve an arrest between July 1, 2000 and June 30, 2001, and be Internet-related.
Instrument Design. The instrument used during the first phase of the study included the mail survey instrument. The final mail survey was in the format of a multi-page booklet, and was developed to be easy for respondents to follow. The mail survey asked two specific questions.

1. “Between July 1, 2000 and June 30, 2001, did your agency make ANY ARRESTS in cases involving the attempted or completed sexual exploitation of a minor, AND at least one of the following occurred:
   a. The offender and the victim first met on the Internet; and/or
   b. The offender committed a sexual offense against the victim on the Internet, regardless of whether or not they first met online.”

2. “Between July 1, 2000 and June 30, 2001, did your agency make ANY ARRESTS in cases involving the possession, distribution or production of child pornography and at least one of the following occurred:
   a. Illegal images were found on the hard drive of a computer or on removable media (e.g., CDs or disks) possessed by the offender; and/or
   b. The offender used the Internet to order or sell child pornography; and/or
   c. There was other evidence that illegal images were downloaded from the Internet or distributed by the offender over the Internet.”

Responding “yes” to any of the previously listed questions resulted in the respondent identifying the case number relating to the incident, as well as listing the primary investigating officer most knowledgeable for that specific case. The second data collection phase consisted of telephone interviews. The instrument design for the telephone interviews consisted of the
following sections: preliminary information, sexual exploitation: online meeting, sexual exploitation: prior face-to-face relationships, production of child pornography, possession of child pornography, undercover investigation, offender, victim, and an interview conclusion.

**Data Collection.** As previously mentioned, the first phase consisted of a mail survey. The following approaches were utilized in attempt to receive a good response rate. First class mail was utilized to send surveys. The mail included the actual survey, personalized cover letters, and business reply envelopes. Two weeks after sending the initial mail survey, reminder postcards were sent to the agencies requesting that they complete the survey and mail back in if they had not already done so. Three weeks later (five weeks after the initial mailing), copies of the mail survey, as well as personalized cover letters stamped “Second Notice” and reply envelopes, were mailed to the agencies who had not yet responded. This step was repeated once more eight weeks after the initial mailing, this time stamped “Third Notice.” As a final attempt to gain a high response rate, interviewers called the agencies that had yet to respond in an attempt to fill out the survey instrument a the phone call. The total response rate to the first phase of the mail survey was 88%.

The second phase of data collection involved the telephone interviews. It should be noted that with regard to the telephone surveys, only law enforcement investigators were interviewed, given their role and subsequent knowledge pertaining to this topic. A total of six trained interviewers were responsible for conducting the interviews. The phone interviews commenced between October 2001 and the end of July 2002. Between the two federal agencies and the 383 local, county, and state agencies that participated in the mail survey, a total of 1,713 cases were presented prior to the telephone survey. Of that total, 37% were not selected for phone interviews due to certain sampling procedures. Furthermore, 16% were ineligible due to not meeting prior
specified eligibility requirements. With the leftover 796 cases, interviews were completed for 79% of the cases, which was 630 total. Of the 630, 18 cases were deleted due to duplication, resulting in a total of 612 cases that completed the telephone interviews.

**Limitations.** There are a number of identified limitations regarding the N-JOV study that deserve noting. The first involves the notion that some errors or biases may have been obtained while interviewing the law-enforcement investigators. Some information provided by these investigators could have been biased by training, attitudes, experiences, or personal opinions. Second, the results of this study only directly relate to child pornography possessors arrested for Internet-related crimes against minors. There is no guarantee that those arrested represent all online child pornography possessors.

**National Juvenile Online Victimization Study (2006).** The second National Juvenile Online Victimization Study (N-JOV2) represents the second wave of data surveying arrests for Internet-related sex crimes against minors in 2006 (Mitchell et al., 2011). The objective of this study was to obtain information regarding a nationally representative sample involving the arrests and characteristics involving Internet sex crimes against minors (Mitchell et al., 2011). The study collected data pertaining to arrests occurring between January 1, 2006 and December 31, 2006. The study was conducted in a very similar manner to the first N-JOV study in which a two-phase process was utilized to collect data from local, county, state, and federal law enforcement agencies. The first phase consisted of a mail survey that was sent to a national-representative sample of law enforcement agencies concerning whether such agencies had made any Internet-related child pornography or sexual exploitation arrests between January 1, 2006 and December 31, 2006. The second phase entailed phone interviews with the investigators of the law enforcement agencies concerning a sample of the cases previously reported within the
mail survey of the first phase. At the conclusion of both phases, the final dataset included data from 1,051 interviews related to the cases.

**Sample.** Within the first phase of the N-JOV2 study, a total 2,598 local, county, and state law enforcement agencies were mailed surveys to constitute a nationally representative sample. The 2,598 \((n)\) total agencies in the sample represented 17\% of the total law enforcement agencies in the United States (15,332). Of the 2,598 agencies that had surveys mailed to them, 87\% of the eligible agencies (2,028) responded to the mail survey. Of all responses, a total of 3,322 cases pertaining to Internet sex crimes against minors involving arrests were reported.

The researchers then designed a sampling procedure for further telephone interviews that took into consideration the total number of cases the agency reported. While there were 3,322 cases reported by law enforcement, 8\% \((n=276)\) were ineligible and 42\% \((n=1,389)\) were not selected due to a sampling procedure. Eligible cases totaled 1,657 and 64\% \((n=1,063)\) of those cases followed through with telephone interviews. Yet a total of 12 cases were identified as duplicate cases. Thus, the total number of completed telephone interviews was 1,051 and were conducted between June 2007 and August 2008.

As with the original N-JOV study, there was certain criterion that was required for eligibility within the N-JOV2 study. To be eligible, the case had to be a sex crime, have a victim under the age of 18, involve an arrest during 2006, and be Internet-related.

**Instrument Design.** The instrument used during the first phase of the study included the mail survey instrument. The final mail survey was in the format of a multi-page booklet, and was developed to be easy for respondents to follow. The mail survey asked two specific questions.
1. “Between January 1, 2006 and December 31, 2006, did your agency make ANY ARRESTS in cases involving the attempted or completed sexual exploitation of a minor, AND at least one of the following occurred:

   a. The offender and the victim first met on the Internet; and/or
   
   b. The offender committed a sexual offense against the victim on the Internet, regardless of whether or not they first met online; and/or
   
   c. The offender was involved in prostitution or other form of commercial sexual exploitation of a minor that involved the Internet in any way.”

2. “Between January 1, 2006 and December 31, 2006, did your agency make ANY ARRESTS in cases involving the possession, distribution or production of child pornography and at least one of the following occurred:

   a. Illegal images were found on the hard drive of a computer or on removable media (e.g., CDs or disks) possessed by the offender; and/or
   
   b. The offender used the Internet to order or sell child pornography; and/or
   
   c. There was other evidence that illegal images were downloaded from the Internet or distributed by the offender over the Internet; and/or
   
   d. Money was paid for access to a Website that featured child pornography.”

Responding “yes” to any of the previously listed questions resulted in requesting that the respondent identify the case number relating to the incident, as well as list the primary investigating officer most knowledgeable for that specific case. The second data collection phase
consisted of telephone interviews. The instrument design for the telephone interviews consisted of questions designed to understand the aspects of the case, specific case characteristics, victim characteristics, and case outcomes.

**Data Collection.** Similar to the first N-JOV study, the first phase consisted of a mail survey. The following techniques were utilized in both N-JOV waves to receive a good response rate. First class mail was utilized to send surveys. The mail included the actual survey, personalized cover letters, and business reply envelopes. Three weeks after sending the initial mail survey, reminder postcards were sent to the agencies requesting that they complete the survey and mail back in if they had not already done so. Three weeks later (six weeks after the initial mailing), additional copies of the mail survey and reply envelopes were mailed to the agencies who had not yet responded. This step was repeated once more nine weeks after the initial mailing to those agencies that had yet to respond. As a final attempt to gain a high response rate, interviewers called the agencies that had yet to respond in an attempt to fill out the survey instrument over the phone. The total response rate to the mail survey in the second N-JOV study was 87%.

The second phase of data collection involved the telephone interviews. It should be noted that with regard to the telephone surveys, only law enforcement investigators were interviewed, given their role and subsequent knowledge pertaining to this topic. A total of six trained interviewers were responsible for conducting the interviews. The phone interviews commenced between June 2007 and August 2008. Between the two federal agencies and the 458 local, county, and state agencies that participated in the mail survey, a total of 3,322 cases were presented prior to the telephone survey. Of that total, 42% were not selected for phone interviews due to certain sampling procedures. Furthermore, 8% were ineligible due to not meeting prior
specified eligibility requirements. With the leftover 1,657 cases, interviews were completed for 64% of the cases, which was 1,063 total. Of the 1,063, 11 cases were deleted due to duplication, resulting in a total of 1,051 cases that completed the telephone interviews in the second wave of the N-JOV study.

**Limitations.** While the strengths of this study are exponential, the authors (Mitchell et al., 2011) noted a few significant limitations that deserve noting. First, as many sex crimes against minors are not reported to law enforcement and those known to law enforcement do not always result in an arrest, it is inaccurate to extend the results of this sample to all individuals committing Internet-related victimization of minors. Instead, it is accurate to extend the results of this study to individuals were arrested during this time period for Internet-related sex crimes against minors, given that the sample was taken specifically from arrest data during the given time periods. A second limitation involves the notion that some errors or biases may have been obtained while interviewing the law-enforcement investigators. Some information provided by investigators could have been biased by training, attitudes, experiences, or personal opinions. The third limitation can be seen in the estimates were solely based on those cases that were interviewed. This promotes the possibility that samples can sometimes be randomly skewed and the margin of error may be greater than previously anticipated. Fourth, all data was gathered from law enforcement investigators, thus resulting in their perception about victims being based at the occurrence of the crime. Data from other agencies, such as mental health or victim service professionals, may yield different results. The fifth limitation results from some un-weighted cell sizes being small and thus having slight inaccuracy of estimates. Finally, it must be noted that the final datasets may not be entirely representative of all law enforcement agencies nationwide.
given that every agency may have been unable to attain every single case that occurred within the time frame.

**Current Research Procedure**

A secondary data analysis will be conducted on both the N-JOV and the N-JOV2 surveys. Specifically, log linear analysis will be conducted to determine whether a statistical relationship exists between the years (2000 and 2006), the technology used, and increased amounts of child pornography stored. Subsequently, if a statistical significance is not found among relationships of the three variables, a chi-square test will be conducted on all variables to determine whether significance can be found amongst two variables.

The independent variables for this research endeavor include: hard drive, removable media, encrypted files, remote storage, peer to peer networks, and password protection. The dependent variables for this research endeavor include: number of images depicting child pornography and number of digital videos depicting child pornography. The years (2000 and 2006) were also categorized as variables for purposes of determining changes among the two datasets. The specific variables selected within the current study were directly related to selected questions within the 2000 N-JOV dataset (Appendix A). The specific variables selected within the current study were directly related to selected questions within the 2006 N-JOV dataset (Appendix B).

**Variables.** The following section discusses the variables obtained through the 2000 and 2006 N-JOV datasets. This section will discuss what variables were utilized and re-coded for the 2000 N-JOV dataset, the 2006 N-JOV dataset, or the combined 2000 and 2006 N-JOV datasets for purposes of the present study. Furthermore, the variable names for the original dataset were
changed to new variable names in attempts to easily decipher between the variables. New variable names were assigned for all variables within the 2000 and 2006 N-JOV studies (Appendix C).

**Amount of Images/Videos Variables.** The following variables measure the total amount of images and the total amount of videos found between the 2000 and 2006 N-JOV studies. The 2000 N-JOV variable that addressed all images found included the following numerical ranges: “None; Less than 50; Between 50 and 100; Between 101 and 999; Between 1000 and 9,999; Between 10,000 and 99,999; and 100,000 or More.” The 2006 N-JOV allowed a numeric input for the amount of images found.

For purposes of the present study, a recoding of image categories was necessary in order to compare both 2000 and 2006 datasets. Thus, the following categories and weighted value were recoded for both datasets: None (1); Less than 50 (2); Between 50 and 100 (3); Between 101 and 999 (4); Between 1000 and 9,999 (5); and 10,000 or More (6). The original category of “100,000 or More” in the 2000 dataset was merged with the “Between 10,000 and 99,999” due to the minimal amount of responses in the “100,000 or More” category. Finally, a new variable was established to include all images from both the 2000 and the 2006 N-JOV datasets. The new variable was named “AllImages” and included all values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “All Images”: None (1); Less than 50 (2); Between 50 and 100 (3); Between 101 and 999 (4); Between 1000 and 9,999 (5); and 10,000 or More (6).

The 2000 N-JOV variable that addressed all videos found included the following numerical ranges: “None; Less than 50; Between 50 and 100; Between 101 and 999;
1000 and 9,999; Between 10,000 and 99,999; and 100,000 or More.” The 2006 N-JOV allowed a numeric input for the amount of videos found.

With regard to the present study, a re-coding of the amount of video categories was necessary in order to compare both 2000 and 2006 N-JOV datasets. Thus, the following categories and weighted value were recoded for both datasets: None (1); Less than 50 (2); Between 50 and 100 (3); Between 101 and 999 (4); 1000 or More (5). The original categories of “Between 10,000 and 99,999” and “100,000 or More” in the 2000 dataset were merged with the “Between 1000 and 9,999” due to the minimal amount of responses in the “Between 10,000 and 99,999” and the “100,000 or More” categories. Finally, a new variable was established to include all videos from both the 2000 and the 2006 N-JOV datasets. The new variable was named “AllVideos” and included all values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “AllVideos”: None (1); Less than 50 (2); Between 50 and 100 (3); Between 101 and 999 (4); 1000 or More (5).

Technological Variables. The following variables relate to technology and were selected for the present study: hard drive, removable media, encrypted files, remote storage, peer to peer networks, and password protection. The following section will discuss the original values for the variables within the 2000 and 2006 datasets, and the new assigned values for purposes of the present study.

For both the 2000 and the 2006 N-JOV datasets, the variable hard drive was categorized based on whether the possessed child pornography was found on the individual’s hard drive of a desktop or a laptop computer. Thus, the responses for both N-JOV datasets was “No” or “Yes” with regard to whether child pornography was possessed on the individual’s hard drive or not.
For purposes of the present study, the following values were given to both response categories for both the 2000 and the 2006 datasets: No (0) and Yes (1). Additionally, the 2000 dataset included “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) as primary categories within the hard drive variable. The 2006 dataset assigned the same variables, “DK/Not Sure” (97), “NA/Refused” (98), and “Not Applicable” (99) under “Missing” data. Thus, for purposes of the present study, the following categories, “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) within the 2000 dataset were re-coded as “Missing” data.

Finally, a new variable was established to include variable information for hard drives for both the 2000 and the 2006 N-JOV datasets. The new variable was named “AllHardDrives” and included all values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “AllHardDrives”: No (0); Yes (1); and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.

For both the 2000 and the 2006 N-JOV datasets, the variable removable media was categorized based on whether the possessed child pornography was found on the individual’s removable media, like computer disks, CDs, or thumb drives. Thus, the responses for both N-JOV datasets was “No” or “Yes” with regard to whether child pornography was possessed on the individual’s removable media or not. For purposes of the present study, the following values were given to both response categories for both the 2000 and the 2006 datasets: No (0) and Yes (1). Additionally, the 2000 dataset included “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) as primary categories within the removable media variable. The 2006 dataset assigned the same variables, “DK/Not Sure” (97), “NA/Refused” (98), and “Not Applicable” (99) under “Missing” data. Thus, for purposes of the present study, the following
categories, “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) within the 2000 dataset were re-coded as “Missing” data.

Finally, a new variable was established to include variable information for removable media for both the 2000 and the 2006 N-JOV datasets. The new variable was named “AllRemovableMedia” and included all values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “AllRemovableMedia”: No (0); Yes (1); and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.

For both the 2000 and the 2006 N-JOV datasets, the variable remote storage was categorized based on whether the possessed child pornography was found on remote storage, such as on a website in attempts to store or hide images. Thus, the responses for both N-JOV datasets was “No” or “Yes” with regard to whether child pornography was possessed on the individual’s remote storage or not. For purposes of the present study, the following values were given to both response categories for both the 2000 and the 2006 datasets: No (0) and Yes (1). Additionally, the 2000 dataset included “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) as primary categories within the remote storage variable. The 2006 dataset assigned the same variables, “DK/Not Sure” (97), “NA/Refused” (98), and “Not Applicable” (99) under “Missing” data. Thus, for purposes of the present study, the following categories, “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) within the 2000 dataset were re-coded as “Missing” data.

Finally, a new variable was established to include variable information for remote storage for both the 2000 and the 2006 N-JOV datasets. The new variable was named
“AllRemoteStorage” and included all values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “AllRemoteStorage”: No (0); Yes (1); and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.

For both the 2000 and the 2006 N-JOV datasets, the variable p2p was categorized based on whether the offender obtained or distributed the possessed child pornography through a p2p network. Thus, the responses for both N-JOV datasets was “No” or “Yes” with regard to whether child pornography possessed by the individual was obtained or distributed through p2p networks. For purposes of the present study, the following values were given to both response categories for both the 2000 and the 2006 datasets: No (0) and Yes (1). Additionally, the 2000 dataset included “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) as primary categories within the p2p variable. The 2006 dataset assigned the same variables, “DK/Not Sure” (97), “NA/Refused” (98), and “Not Applicable” (99) under “Missing” data. Thus, for purposes of the present study, the following categories, “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) within the 2000 dataset were re-coded as “Missing” data.

Finally, a new variable was established to include variable information for p2p for both the 2000 and the 2006 N-JOV datasets. The new variable was named “AllP2P” and included all values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “AllP2P”: No (0); Yes (1); and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.

For both the 2000 and the 2006 N-JOV datasets, the variable password protection was categorized based on whether the offender utilized password protection in attempts to hide or
conceal access to child pornography. Thus, the responses for both N-JOV datasets was “No” or “Yes” with regard to whether child pornography possessed by the individual was hidden by password protection methods. For purposes of the present study, the following values were given to both response categories for both the 2000 and the 2006 datasets: No (0) and Yes (1). Additionally, the 2000 dataset included “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) as primary categories within the password protection variable. The 2006 dataset assigned the same variables, “DK/Not Sure” (97), “NA/Refused” (98), and “Not Applicable” (99) under “Missing” data. Thus, for purposes of the present study, the following categories, “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) within the 2000 dataset were re-coded as “Missing” data.

Finally, a new variable was established to include variable information for password protection for both the 2000 and the 2006 N-JOV datasets. The new variable was named “AllPasswordProtection” and included all values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “AllPasswordProtection”: No (0); Yes (1); and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.

For both the 2000 and the 2006 N-JOV datasets, the variable encryption was categorized based on whether the offender utilized encryption in attempts to hide or conceal access to child pornography. Thus, the responses for both N-JOV datasets was “No” or “Yes” with regard to whether child pornography possessed by the individual was hidden by encryption methods. For purposes of the present study, the following values were given to both response categories for both the 2000 and the 2006 datasets: No (0) and Yes (1). Additionally, the 2000 dataset included “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) as primary categories within
the encryption variable. The 2006 dataset assigned the same variables, “DK/Not Sure” (97), “NA/Refused” (98), and “Not Applicable” (99) under “Missing” data. Thus, for purposes of the present study, the following categories, “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) within the 2000 dataset were re-coded as “Missing” data.

Finally, a new variable was established to include variable information for encryption for both the 2000 and the 2006 N-JOV datasets. The new variable was named “AllEncryption” and included all values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “AllEncryption”: No (0); Yes (1); and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.

**Demographic Variables.** Demographic variables used for the present study include gender, age, race, type of living location, schooling background, marital status, and prior arrest history for sexual offenses. All of the demographic variables used were addressed in both the 2000 and 2006 N-JOV studies. For purposes of the present study, a recoding of the demographic variables was necessary in order to compare both 2000 and 2006 datasets.

The demographic variable gender from the 2000 and 2006 N-JOV studies were categorized as Male (1) and Female (2). A new variable was named “AllGender” and included all gender values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “AllGender”: Male (1); Female (2); and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.

The demographic variable “age” from the 2000 and 2006 N-JOV studies were categorized as 14-25 (1); 26-39 (2); 40-49 (3); and 50 or Older (4). A new variable was named “AllAges” and included all age values from the 2000 and the 2006 N-JOV datasets. The
following categories were assigned for the new variable “AllAges”: 14-25 (1); 26-39 (2); 40-49 (3); 50 or Older (4) and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.

The demographic variable “race” from the 2000 and 2006 N-JOV studies were categorized as White (1); Black (2); Asian (3); and Other (4). A new variable was named “Race All” and included all race values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “Race All”: White (1); Black (2); Asian (3); Other (4) and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.

The demographic variable “schooling” from the 2000 and 2006 N-JOV studies were categorized as “Did not finish high school” (1); “Graduated high school” (2); “Some college education” (3); and “College Degree” (4). A new variable was named “All Schooling” and included all schooling values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “All Schooling”: “Did not finish high school” (1); “Graduated high school” (2); “Some college education” (3); “College Degree” (4); and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.

The demographic variable “marriage” from the 2000 and 2006 N-JOV studies were categorized as “Single, never married” (1); “Married” (2); “Living with a partner” (3); and “Separated, divorced, or widowed” (4). A new variable was named “All Married” and included all marriage values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “All Married Single, never married” (1); “Married” (2); “Living
with a partner” (3); and “Separated, divorced, or widowed” (4); and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.

The demographic variable “prior arrests” from the 2000 and 2006 N-JOV studies were categorized as whether the offender had any prior arrests for sexual offending and were coded as “No” (0) or “Yes” (1). A new variable was named “All Prior Arrests” and included all prior sexual arrest values from the 2000 and the 2006 N-JOV datasets. The following categories were assigned for the new variable “No (0), “Yes” (1); and “DK” (97), “NA/REFUSED” (98), and “NOT APPLICABLE” (99) were coded as “Missing” data.
CHAPTER V

FINDINGS

The following section discusses the findings of the present study. For statistical analysis purposes, all data was input and analyzed within SPSS, version 20. Both log linear analysis and chi-square cross-tabulations were used for analyzing the data. The demographic findings will be discussed first, followed by the log linear analysis findings, and finally the chi-square cross-tabulation analyses. This chapter will conclude with a discussion of the results.

Demographics

The following section discusses the demographic findings from the 2000 N-JOV study, the 2006 N-JOV study, and the combined 2000 and 2006 N-JOV studies. Table 1 compares the demographics from 2000, 2006, and 2000 & 2006 combined.

With regard to gender, male represents the predominant category for both 2000 (98.9%) and 2006 (99%). With respect to race, white represents the predominant category for both 2000 (95.7%) and 2006 (93.7%). With respect to age, 2000 witnessed a larger sample in the 26-39 category (41.8%), followed by 40-49 (24.2%), 50 or older (18.5%), and 14-25 (15.5%). The age categories were slightly different in 2006, with the highest portion being in the 26-39 category (34.5%), followed by 14-25 (25%), 40-49 (22.7%), and 50 or older (17.8%). These results illustrate the most significant change in the 14-25 age categories between 2000 and 2006.

With regard to living locations, 30.4% of respondents lived in suburban areas, 24% lived in urban, 21% lived in a small town, 14.3% lived in a large town, and 10.3% lived in rural areas in 2000. In 2006, 30.3% of individuals lived in suburban areas, 25.6% lived in urban areas,
18.6% lived in a small town, 14.4% lived in rural areas, and 11% lived in a large town. This illustrates the most significant change in living location is the higher number of individuals in rural areas and lesser number of respondents in a large town in 2006 with comparison to 2000.

Table 1

Demographic Variables

<table>
<thead>
<tr>
<th></th>
<th>2000 (n=612)</th>
<th>2006 (n=1051)</th>
<th>2000 &amp; 2006 (n=1663)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>605 (98.9%)</td>
<td>1040 (99%)</td>
<td>1645 (98.9%)</td>
</tr>
<tr>
<td>Female</td>
<td>7 (1.1%)</td>
<td>11 (1%)</td>
<td>18 (1.1%)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14-25</td>
<td>95 (15.5%)</td>
<td>263 (25%)</td>
<td>358 (21.5%)</td>
</tr>
<tr>
<td>26-39</td>
<td>256 (41.8%)</td>
<td>362 (34.5%)</td>
<td>618 (37.2%)</td>
</tr>
<tr>
<td>40-49</td>
<td>148 (24.2%)</td>
<td>238 (22.7%)</td>
<td>386 (23.2%)</td>
</tr>
<tr>
<td>50 or Older</td>
<td>113 (18.5%)</td>
<td>187 (17.8%)</td>
<td>300 (18.1%)</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>581 (95.7%)</td>
<td>971 (93.7%)</td>
<td>1552 (94.5%)</td>
</tr>
<tr>
<td>Black</td>
<td>14 (2.3%)</td>
<td>42 (4.1%)</td>
<td>56 (3.4%)</td>
</tr>
<tr>
<td>Asian</td>
<td>10 (1.6%)</td>
<td>18 (1.7%)</td>
<td>28 (1.7%)</td>
</tr>
<tr>
<td>Other</td>
<td>2 (0.3%)</td>
<td>5 (0.5%)</td>
<td>7 (0.4%)</td>
</tr>
<tr>
<td><strong>Type of Living Locations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>144 (24%)</td>
<td>265 (25.6%)</td>
<td>409 (25%)</td>
</tr>
<tr>
<td>Suburban</td>
<td>183 (30.4%)</td>
<td>314 (30.3%)</td>
<td>497 (30.4%)</td>
</tr>
<tr>
<td>Large Town</td>
<td>86 (14.3%)</td>
<td>114 (11%)</td>
<td>200 (12.2%)</td>
</tr>
<tr>
<td>Small Town</td>
<td>126 (21%)</td>
<td>193 (18.6%)</td>
<td>319 (19.5%)</td>
</tr>
<tr>
<td>Rural</td>
<td>62 (10.3%)</td>
<td>149 (14.4%)</td>
<td>211 (12.9%)</td>
</tr>
<tr>
<td><strong>School Background</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not finish high school</td>
<td>36 (7.3%)</td>
<td>82 (10.5%)</td>
<td>118 (9.3%)</td>
</tr>
<tr>
<td>Graduated high school</td>
<td>193 (39.1%)</td>
<td>324 (41.4%)</td>
<td>517 (40.5%)</td>
</tr>
<tr>
<td>Some college</td>
<td>115 (23.3%)</td>
<td>194 (24.8%)</td>
<td>309 (24.2%)</td>
</tr>
<tr>
<td>College degree</td>
<td>149 (30.2%)</td>
<td>182 (23.3%)</td>
<td>331 (26%)</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single, never married</td>
<td>247 (41.2%)</td>
<td>513 (50.5%)</td>
<td>760 (47.1%)</td>
</tr>
<tr>
<td>Married</td>
<td>194 (32.3%)</td>
<td>276 (27.2%)</td>
<td>470 (29.1%)</td>
</tr>
<tr>
<td>Living with a partner</td>
<td>29 (4.8%)</td>
<td>60 (5.9%)</td>
<td>89 (5.5%)</td>
</tr>
<tr>
<td>Separated, divorced, or widowed</td>
<td>130 (21.7%)</td>
<td>166 (16.4%)</td>
<td>296 (18.3%)</td>
</tr>
<tr>
<td><strong>Prior Arrests for Sexual Offenses</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>527 (86.8%)</td>
<td>930 (89.4%)</td>
<td>1457 (88.5%)</td>
</tr>
<tr>
<td>Yes</td>
<td>80 (13.2%)</td>
<td>110 (10.6%)</td>
<td>190 (11.5%)</td>
</tr>
</tbody>
</table>
Schooling background witnessed slightly significant changes between 2000 and 2006. Graduated high school was the largest category for 2000 (39.1%), followed by college degree (30.2%), some college (23.3%), and finally did not finish high school (7.3%). For 2006, 41.4% graduated high school, 24.8% attained some college education, 23.3% earned a college degree, and 10.5% did not finish high school. These results indicate that more of these offenders are likely to have education than to not attain higher education.

For 2000, the largest amount of respondents with regard to marital status was single, never married (41.2%); followed by married (32.3%); separated, divorced, or widowed (21.7%); and finally living with a partner (4.8%). For 2006, the largest amount of respondents with regard to marital status was single, never married (50.5%); followed by married (27.2%); separated, divorced, or widowed (16.4%); and finally living with a partner (5.9%). There is a significant increase in percentage in single, never married from 2000 (41.2%) to 2006 (50.5%).

With regard to prior arrests for sexual offenses, 2000 witnessed 86.8% of individuals that had not been arrested previously for a sexual offense with a remaining 13.2% of individuals that had been arrested previously for a sexual offense. Finally, with respect to 2006, 89.4% of individuals had not been previously arrested for a sexual offense with 10.6% of individuals identifying as having prior arrests for sexual offenses. There is not significant statistical change in prior arrest history for sexual offenses between 2000 and 2006.

To determine whether there was a significant change in the demographic variables between 2000 and 2006, chi-square cross-tabulations were conducted on all demographic variables to compare the differences between the 2000 N-JOV study and the 2006 N-JOV study. Specifically, the independent variable for the chi-square cross-tabulations was the combined
(2000, 2006) datasets and the dependent variable was the demographic variable (All Gender, All Age, All Race, All Living, All Schooling, All Married, and all Prior Arrests). Table 2 shows the results from the chi-square cross-tabulations for all demographic variables.

Table 2
Chi-Square Tests for Demographic Variables

<table>
<thead>
<tr>
<th>Demographic Variable</th>
<th>2000 &amp; 2006 (n=1663)</th>
<th>( \chi^2 )</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1645 (98.9%)</td>
<td>.034</td>
<td>1</td>
</tr>
<tr>
<td>Female</td>
<td>18 (1.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>22.382***</td>
<td>3</td>
</tr>
<tr>
<td>14-25</td>
<td>358 (21.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26-39</td>
<td>618 (37.2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>40-49</td>
<td>386 (23.2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 or Older</td>
<td>300 (18.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td>3.819</td>
<td>3</td>
</tr>
<tr>
<td>White</td>
<td>1552 (94.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>56 (3.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>28 (1.7%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>7 (0.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of Living Locations</td>
<td></td>
<td>9.744*</td>
<td>4</td>
</tr>
<tr>
<td>Urban</td>
<td>409 (25%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suburban</td>
<td>497 (30.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large Town</td>
<td>200 (12.2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small Town</td>
<td>319 (19.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>211 (12.9%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Background</td>
<td></td>
<td>9.600*</td>
<td>3</td>
</tr>
<tr>
<td>Did not finish high school</td>
<td>118 (9.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduated high school</td>
<td>517 (40.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>309 (24.2%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College degree</td>
<td>331 (26%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td>17.069***</td>
<td>3</td>
</tr>
<tr>
<td>Single, never married</td>
<td>760 (47.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>470 (29.1%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living with a partner</td>
<td>89 (5.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separated, divorced, or widowed</td>
<td>296 (18.3%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prior Arrests for Sexual Offenses</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>1457 (88.5%)</td>
<td>2.544</td>
<td>1</td>
</tr>
<tr>
<td>Yes</td>
<td>190 (11.5%)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*\( p \leq 0.05 \)

**\( p \leq 0.01 \)

***\( p \leq 0.001 \)
Based on the chi-square cross-tabulations, the most significant statistical differences between the two years can be seen in age, type of living location, school background, and marital status. This section will conclude with a discussion pertaining to where there statistically significant differences existed among the demographic variables over time.

With regard to age, there was a significant increase in the “14-25” age category between 2000 and 2006. Specifically, 15.5% of the sample represented the 14-25 age category in 2000; however that percentage increased to 25% within the 14-25 age category in 2006. Contrastingly, the “26-39” age category witnessed a decrease between 2000 and 2006. Specifically, 14.8% of the sample in 2000 represented the 26-39 age category; contrastingly, 2006 decreased to 34.5% in the 26-39 age category. This statistical significance within the age category illustrates that the offenders decreased in age over time.

With regard to living location, there was a decrease in respondents identifying as residing in a “Large Town” between 2000 and 2006. Specifically, 14.3% of the respondents in 2000 stated they lived in a large town; however, in 2006, 11% of the individuals identified as living in a large town. Contrastingly, there was an increase in respondents identifying as living in a “Rural” area over time. Specifically, 10.3% of the offenders stated that they lived in a rural area in 2000; however 14.4% of the respondents identified as living in a rural area in 2006. This statistical significance within the living category illustrates that the offenders merged from large towns to rural areas over time.

With regard to school background, the most statistically significant difference pertained to whether the individual had obtained a college degree. Specifically, 30.2% of the offenders arrested in 2000 identified as having a college degree. However, individuals arrested in 2006
with college degrees only accounted for 23.3% of the sample. This reveals a statistically significant decrease in these offenders obtaining college degrees over time.

With respect to marital status, there was a significant increase in respondents identifying as “Single, never married” from 2000 to 2006. Specifically, 41.2% of the sample identified as being single, never married in 2000. However, by 2006, 50.5% of the respondents identified as being single, never married. This illustrates a significant increase in individuals identifying as being single, never married across time.

Log Linear Analysis on Variables

Because the hypotheses concern the relationship among three variables, log linear analysis was chosen to be conducted on the three variables to determine whether a statistically significant relationship exists among the three variables. Log linear analysis is a technique often used to examine and determine a relationship between more than two categorical variables. Log linear analysis is used for both hypothesis testing and model building, for purposes of the present study it will be used to test the twelve previously stated hypotheses. Log linear analysis utilizes a likelihood ratio statistic that maintains an approximate chi-square distribution when the sample size is large (Field, 2005). Furthermore, with log linear analysis, there are no distinct independent or dependent variables. For log linear analysis testing, the variables are all treated equally.

With log linear analysis, there are two assumptions that must always hold true. First, the observations must be random and independent (Field, 2005). Second, the “observed frequencies are normally distributed about expected frequencies over repeated samples” (Field, 2005). Additionally, with log linear analysis, data should always be categorical. In running log linear
analyses, the model fits well when the residuals remain close to 0. The residuals concern the observed-expected results. In sum, the model fit is better the closer the expected frequencies are to the observed frequencies. Thus, if the model fits well, meaning that the expected frequencies are close to the observed frequencies, then the chi-square statistic is not significant (Field, 2005). Contrastingly, the model does not fit well if the calculated expected frequencies are not close to observed frequencies, thus the chi-square statistic is significant (Field, 2005).

The variables within the log linear analysis testing are treated the same, thus for purpose of the log linear tests, type of technology, year, and amount of images/videos will not be categorized as independent or dependent. The primary goal of running log linear analyses within the present study is to examine the relationship or interaction between the three variables.

Table 3 illustrates the findings from the log linear analyses that were run for all hypotheses within the present study. For all log linear tests conducted, the residuals (observed-expected relationships) were all observed to ascertain how well the model fits. Based on the findings illustrated in Table 3, there was no statistical significance amongst the relationships of the three variables within any of the hypotheses.
Table 3
Log Linear Analysis for Variables

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$\chi^2$</th>
<th>df</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1 Years (2000, 2006) All Images All Hard Drives</td>
<td>10.657</td>
<td>5</td>
<td>.059</td>
</tr>
<tr>
<td>H2 Years (2000, 2006) All Videos All Hard Drives</td>
<td>5.309</td>
<td>4</td>
<td>.257</td>
</tr>
<tr>
<td>H3 Years (2000, 2006) All Images All Removable Media</td>
<td>6.701</td>
<td>5</td>
<td>.244</td>
</tr>
<tr>
<td>H4 Years (2000, 2006) All Videos All Removable Media</td>
<td>3.034</td>
<td>4</td>
<td>.552</td>
</tr>
<tr>
<td>H5 Years (2000, 2006) All Images All Remote Storage</td>
<td>4.018</td>
<td>5</td>
<td>.547</td>
</tr>
<tr>
<td>H7 Years (2000, 2006) All Images All P2P</td>
<td>3.797</td>
<td>5</td>
<td>.579</td>
</tr>
<tr>
<td>H8 Years (2000, 2006) All Videos All P2P</td>
<td>4.423</td>
<td>4</td>
<td>.352</td>
</tr>
<tr>
<td>H9 Years (2000, 2006) All Images All Password Protection</td>
<td>3.017</td>
<td>5</td>
<td>.697</td>
</tr>
<tr>
<td>H10 Years (2000, 2006) All Videos All Password Protection</td>
<td>9.256</td>
<td>4</td>
<td>.055</td>
</tr>
<tr>
<td>H11 Years (2000, 2006) All Images All Encrypted Files</td>
<td>4.944</td>
<td>5</td>
<td>.423</td>
</tr>
<tr>
<td>H12 Years (2000, 2006) All Videos All Encrypted Files</td>
<td>2.222</td>
<td>4</td>
<td>.695</td>
</tr>
</tbody>
</table>
Chi-Square Cross-Tabulation Tests on Variables

Because a significant three-way relationship was not determined amongst the combination of three variables within any of the hypotheses through log linear analysis, a two-way relationship will be conducted through chi-square cross-tabulations to determine whether a statistically significant relationship exists among two variables instead of three. Table 4 discusses all chi-square cross-tabulation tests that were conducted to assess whether a two-way relationship was significant or not.

Year (2000, 2006) and Images/Videos. The relationship of year (2000, 2006) and all images from 2000 and 2006 relates to the storage, exchange, and anonymity variables within the following hypotheses: H1, H3, H5, H7, H9, and H11. The relationship of year (2000, 2006) and all videos from 2000 and 2006 relates to the storage, exchange, and anonymity variables within the following hypotheses: H2, H4, H6, H8, H10, and H12. To avoid discussing the statistically significant findings with regard to the relationship between year and images or year and videos within all three sections (storage, exchange, anonymity), they will be discussed in the following section before discussion of the storage variables. It should be noted however that year (2000, 2006) and all images, as well as year (2000, 2006) and all videos relates to storage, exchange, and anonymity variables.

Year (2000, 2006) & All Images. In analyzing the chi-square cross-tabulations of the years (2000 and 2006) and ‘All Images,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that the statistical significance was found in the following categories of ‘All Images’: “Less than 50; Between 50 and 100; and Between 101 and 999,” between the 2000 and 2006 datasets.
<table>
<thead>
<tr>
<th></th>
<th>Year &amp; Amount</th>
<th>Year &amp; Technology</th>
<th>Technology &amp; Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>Year (2000, 2006) &amp; All Images</td>
<td>Year (2000, 2006) &amp; All Hard Drives</td>
<td>All Hard Drives &amp; All Images</td>
</tr>
<tr>
<td>H2</td>
<td>Year (2000, 2006) &amp; All Videos</td>
<td>Year (2000, 2006) &amp; All Hard Drives</td>
<td>All Hard Drives &amp; All Videos</td>
</tr>
<tr>
<td>H3</td>
<td>Year (2000, 2006) &amp; All Images</td>
<td>Year (2000, 2006) &amp; All Removable Media</td>
<td>All Removable Media &amp; All Images</td>
</tr>
<tr>
<td>H4</td>
<td>Year (2000, 2006) &amp; All Videos</td>
<td>Year (2000, 2006) &amp; All Removable Media</td>
<td>All Removable Media &amp; All Videos</td>
</tr>
<tr>
<td>H7</td>
<td>Year (2000, 2006) &amp; All Images</td>
<td>Year (2000, 2006) &amp; All P2P</td>
<td>All P2P &amp; All Images</td>
</tr>
<tr>
<td>H8</td>
<td>Year (2000, 2006) &amp; All Videos</td>
<td>Year (2000, 2006) &amp; All P2P</td>
<td>All P2P &amp; All Videos</td>
</tr>
<tr>
<td>H9</td>
<td>Year (2000, 2006) &amp; All Images</td>
<td>Year (2000, 2006) &amp; All Password Protection</td>
<td>All Password Protection &amp; All Images</td>
</tr>
<tr>
<td>H10</td>
<td>Year (2000, 2006) &amp; All Videos</td>
<td>Year (2000, 2006) &amp; All Password Protection</td>
<td>All Password Protection &amp; All Videos</td>
</tr>
<tr>
<td>H11</td>
<td>Year (2000, 2006) &amp; All Images</td>
<td>Year (2000, 2006) &amp; All Encrypted Files</td>
<td>All Encrypted Files &amp; All Images</td>
</tr>
<tr>
<td>H12</td>
<td>Year (2000, 2006) &amp; All Videos</td>
<td>Year (2000, 2006) &amp; All Encrypted Files</td>
<td>All Encrypted Files &amp; All Videos</td>
</tr>
</tbody>
</table>
For the “Less than 50” variable, the adjusted residual for the year 2000 was 2.2, while the adjusted residual for 2006 was -2.2. The expected count for “Less than 50” images in 2000 was 90.9 however, the final count was 105. The expected count for “Less than 50” images in 2006 was 127.1 however, the final count was 113.

For the “Between 50 and 100” variable, the adjusted residual for the year 2000 was -4.0, while the adjusted residual for 2006 was 4.0. The expected count for “Between 50 and 100” images in 2000 was 79.3 however, the final count was 55. The expected count for “Between 50 and 100” images in 2006 was 110.7 however, the final count was 135.

For the “Between 101 and 999” variable, the adjusted residual for the year 2000 was 2.8, while the adjusted residual for 2006 was -2.8. The expected count for “Between 101 and 999” images in 2000 was 120.2 however, the final count was 140. The expected count for “Between 101 and 999” images in 2006 was 167.8 however, the final count was 148.

Findings from the chi-square cross-tabulations with regards to the two-way interaction between year (2000, 2006) and all images concluded that the amount of images did not increase across years. Conclusions from the chi-square cross-tabulations do not support H1, H3, H5, H7, H9, and H11.

**Year (2000, 2006) & All Videos.** In analyzing the chi-square cross-tabulations of the years (2000 and 2006) and ‘All Videos,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that the statistical significance was found in the following categories of ‘All Videos’: “None; Less than 50; Between 50 and 100; Between 101 and 999; and 1000 or More,” between the 2000 and 2006 datasets.
For the “None” variable, the adjusted residual for the year 2000 was 17.2, while the adjusted residual for 2006 was -17.2. The expected count for “None” videos in 2000 was 133.2 however, the final count was 244. The expected count for “None” videos in 2006 was 118.8 however, the final count was 8.

For the “Less than 50” variable, the adjusted residual for the year 2000 was -6.5, while the adjusted residual for 2006 was 6.5. The expected count for “Less than 50” videos in 2000 was 151.7 however, the final count was 109. The expected count for “Less than 50” videos in 2006 was 135.3 however, the final count was 178.

For the “Between 50 and 100” variable, the adjusted residual for the year 2000 was -9.9, while the adjusted residual for 2006 was 9.9. The expected count for “Between 50 and 100” videos in 2000 was 65 however, the final count was 15. The expected count for “Between 50 and 100” videos in 2006 was 58 however, the final count was 108.

For the “Between 101 and 999” variable, the adjusted residual for the year 2000 was -2.2, while the adjusted residual for 2006 was -2.2. The expected count for “Between 101 and 999” videos in 2000 was 27.5 however, the final count was 20. The expected count for “Between 101 and 999” videos in 2006 was 24.5 however, the final count was 32.

For the “1000 or More” variable, the adjusted residual for the year 2000 was -4.4, while the adjusted residual for 2006 was 4.4. The expected count for “1000 or More” videos in 2000 was 12.7 however, the final count was 2. The expected count for “1000 or More” videos in 2006 was 11.3 however, the final count was 22.

Findings from the chi-square cross-tabulations with regards to the two-way interaction between year (2000, 2006) and all videos concluded that the amount of videos did increase
across years. Conclusions from the chi-square cross-tabulations do support H2, H4, H6, H8, H10, and H12.

**Storage Variables.** Chi-square cross-tabulations were performed on the following storage variables: hard drives, removable media, and remote storage. As illustrated in Table 4, two-way relationships among the type of technology, the year, and the amount of images/videos were tested through chi-square cross-tabulation analyses. Table 5 illustrates the significant relationships found after performing chi-square analyses on the storage variables. Following Table 5, greater detail will be discussed pertaining to the statistical significance and the specific variables that affect that significance. In particular, adjusted residuals will be analyzed to verify which variables contain the significance through analyzing counts and expected counts. It should be noted that for purposes of the present study, all adjusted residuals greater than 2 or less than -2 were determined to be of statistical significance and are discussed in greater detail.

**All Hard Drives & All Images.** In analyzing the chi-square cross-tabulations of ‘All Hard Drives’ and ‘All Images,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that statistical significance was found in the following categories: “None; Less than 50; Between 101 and 999; Between 1000 and 9,999; and 10,000 or More” of the ‘All Images’ category between the ‘All Hard Drives’ variables. ‘All Hard Drives’ was categorized as ‘No’ or ‘Yes’ with regard to images being stored on a hard drive.

For the ‘None’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (a hard drive was not used) was 7.3, while the adjusted residual for ‘Yes’ (a hard drive was used) was -7.3. The expected count for ‘None’ images in “No” a hard drive was not used
was 4.2 however, the final count was 18. The expected count for ‘None’ images in ‘Yes’ a hard drive was used was 30.8 however, the final count was 17.

Table 5
Chi-Square Cross-Tabulations for Storage Variables of Statistical Significance

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Two-Way Interaction</th>
<th>$\chi^2$</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1, H3, H5</td>
<td>Year (2000, 2006) &amp; All Images</td>
<td>26.510***</td>
<td>5</td>
</tr>
<tr>
<td>H2, H4, H6</td>
<td>Year (2000, 2006) &amp; All Videos</td>
<td>326.023***</td>
<td>4</td>
</tr>
<tr>
<td>H1</td>
<td>All Hard Drives &amp; All Images</td>
<td>80.211***</td>
<td>5</td>
</tr>
<tr>
<td>H2</td>
<td>All Hard Drives &amp; All Videos</td>
<td>17.936***</td>
<td>4</td>
</tr>
<tr>
<td>H3, H4</td>
<td>Year (2000, 2006) &amp; All Removable Media</td>
<td>7.709**</td>
<td>1</td>
</tr>
<tr>
<td>H3</td>
<td>All Removable Media &amp; All Images</td>
<td>92.852***</td>
<td>5</td>
</tr>
<tr>
<td>H4</td>
<td>All Removable Media &amp; All Videos</td>
<td>21.966***</td>
<td>4</td>
</tr>
</tbody>
</table>

* $\rho \leq 0.05$

** $\rho \leq 0.01$

*** $\rho \leq 0.001$

For the ‘Less than 50’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (a hard drive was not used) was 4.0, while the adjusted residual for ‘Yes’ (a hard drive was used) was -4.0. The expected count for ‘Less than 50’ images in “No” a hard drive was not used was 25.4 however, the final count was 42. The expected count for ‘Less than 50’ images in ‘Yes’ a hard drive was used was 185.6 however, the final count was 169.
For the ‘Between 101 and 999’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (a hard drive was not used) was -2.3, while the adjusted residual for ‘Yes’ (a hard drive was used) was 2.3. The expected count for ‘Between 101 and 999’ images in “No” a hard drive was not used was 34.4 however, the final count was 24. The expected count for ‘Between 101 and 999’ images in ‘Yes’ a hard drive was used was 251.6 however, the final count was 262.

For the ‘Between 1000 and 9,999’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (a hard drive was not used) was -2.7, while the adjusted residual for ‘Yes’ (a hard drive was used) was 2.7. The expected count for ‘Between 1000 and 9,999’ images in “No” a hard drive was not used was 17.7 however, the final count was 8. The expected count for ‘Between 1000 and 9,999’ images in ‘Yes’ a hard drive was used was 129.3 however, the final count was 139.

For the ‘10,000 or More’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (a hard drive was not used) was -2.5, while the adjusted residual for ‘Yes’ (a hard drive was used) was 2.5. The expected count for ‘10,000 or More’ images in “No” a hard drive was not used was 7.1 however, the final count was 1. The expected count for ‘10,000 or More’ images in ‘Yes’ a hard drive was used was 51.9 however, the final count was 58.

Findings from the chi-square cross-tabulations with regards to the two-way interaction between hard drives and image amount concluded that hard drives were used to a greater extent as image amount increased. Conclusions from the chi-square cross-tabulations do support H1.

**All Hard Drives & All Videos.** In analyzing the chi-square cross-tabulations of ‘All Hard Drives’ and ‘All Videos,’ results revealed that a statistical significance does exist within
this two-way relationship. Further analyzing revealed that statistical significance was found in the following categories: “Less than 50; and Between 50 and 100” of the ‘All Videos’ category between the ‘All Hard Drives’ variables. ‘All Hard Drives’ was categorized as ‘No’ or ‘Yes’ with regard to videos being stored on a hard drive.

For the ‘Less than 50’ variable (regarding the amount of videos retrieved), the adjusted residual for ‘No’ (a hard drive was not used) was 2.0, while the adjusted residual for ‘Yes’ (a hard drive was used) was -2.0. The expected count for ‘Less than 50’ videos in “No” a hard drive was not used was 34.4 however, the final count was 43. The expected count for ‘None’ videos in ‘Yes’ a hard drive was used was 249.6 however, the final count was 241.

For the ‘Between 50 and 100’ variable (regarding the amount of videos retrieved), the adjusted residual for ‘No’ (a hard drive was not used) was -2.8, while the adjusted residual for ‘Yes’ (a hard drive was used) was 2.8. The expected count for ‘Between 50 and 100’ videos in “No” a hard drive was not used was 14.2 however, the final count was 5. The expected count for ‘Less than 50’ videos in ‘Yes’ a hard drive was used was 102.8 however, the final count was 112.

Findings from the chi-square cross-tabulations with regards to the two-way interaction between hard drives and video amount concluded that hard drives were used to a greater extent as video amount increased. Conclusions from the chi-square cross-tabulations do support H2.

**Year (2000, 2006) & All Removable Media.** In analyzing the chi-square cross-tabulations of the years (2000 and 2006) and ‘All Removable Media,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that the statistical significance was found regarding whether the individual did not use removable media (‘No’) or they did use removable media (‘yes’) between the 2000 and 2006 datasets.
For the “No” variable (insinuating that the individual did not use removable media), the adjusted residual for the year 2000 was -2.8, while the adjusted residual for 2006 was 2.8. The expected count for “No” removable media was not used in 2000 was 227.3 however, the final count was 206. The expected count for “No” removable media was not used in 2006 was 325.7 however, the final count was 347.

For the “Yes” variable (insinuating that the individual did use removable media), the adjusted residual for the year 2000 was 2.8, while the adjusted residual for 2006 was -2.8. The expected count for “Yes” removable media was used in 2000 was 179.7 however, the final count was 201. The expected count for “Yes” removable media was used in 2006 was 257.3 however, the final count was 236.

Findings from the chi-square cross-tabulations with regards to the two-way interaction between year (2000, 2006) and removable media concluded that removable media was used to a lesser extent across years. Conclusions from the chi-square cross-tabulations do support H3 or H4.

**All Removable Media & All Images.** In analyzing the chi-square cross-tabulations of ‘All Removable Media’ and ‘All Images,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that statistical significance was found in the following categories: “Less than 50; Between 50 and 100; Between 1000 and 9,999; and 10,000 or More” of the ‘All Images’ category between the ‘All Removable Media variables. ‘All Removable Media’ was categorized as ‘No’ or ‘Yes’ with regard to whether images were stored on removable media.

For the ‘Less than 50’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (removable media was not used) was 6.1, while the adjusted residual for ‘Yes’
(removable media was used) was -6.1. The expected count for ‘Less than 50’ images in “No” removable media was not used was 115 however, the final count was 153. The expected count for ‘Less than 50’ images in ‘Yes’ removable media was used was 91 however, the final count was 53.

For the ‘Between 50 and 100’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (removable media was not used) was 2.8, while the adjusted residual for ‘Yes’ (removable media was used) was -2.8. The expected count for ‘Between 50 and 100’ images in “No” removable media was not used was 97.7 however, the final count was 114. The expected count for ‘Between 50 and 100’ images in ‘Yes’ removable media was used was 77.3 however, the final count was 61.

For the ‘Between 1000 and 9,999’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (removable media was not used) was -5.3, while the adjusted residual for ‘Yes’ (removable media was used) was 5.3. The expected count for ‘Between 1000 and 9,999’ images in “No” removable media was not used was 82.1 however, the final count was 53. The expected count for ‘Between 1000 and 9,999’ images in ‘Yes’ removable media was used was 64.9 however, the final count was 94.

For the ‘10,000 or more’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (removable media was not used) was -5.7, while the adjusted residual for ‘Yes’ (removable media was used) was 5.7. The expected count for ‘10,000 or more’ images in “No” removable media was not used was 32.9 however, the final count was 12. The expected count for ‘10,000 or more’ images in ‘Yes’ removable media was used was 26.1 however, the final count was 47.
Findings from the chi-square cross-tabulations with regards to the two-way interaction between removable media and image amount concluded that removable media was used to a greater extent as image amount increased. Conclusions from the chi-square cross-tabulations do support H3.

**All Removable Media & All Videos.** In analyzing the chi-square cross-tabulations of ‘All Removable Media’ and ‘All Videos,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that statistical significance was found in the following categories: “None; Between 101 and 999; and 1000 or More” of the ‘All Videos’ category between the ‘All Removable Media variables. ‘All Removable Media’ was categorized as ‘No’ or ‘Yes’ with regard to whether videos were stored on removable media.

For the ‘None’ variable (regarding the amount of videos retrieved), the adjusted residual for ‘No’ (removable media was not used) was 2.0, while the adjusted residual for ‘Yes’ (removable media was used) was -2.0. The expected count for ‘None’ videos in “No” removable media was not used was 123.4 however, the final count was 136. The expected count for ‘None’ videos in ‘Yes’ removable media was used was 119.6 however, the final count was 107.

For the ‘Between 101 and 999’ variable (regarding the amount of videos retrieved), the adjusted residual for ‘No’ (removable media was not used) was -2.9, while the adjusted residual for ‘Yes’ (removable media was used) was 2.9. The expected count for ‘Between 101 and 999’ videos in “No” removable media was not used was 25.9 however, the final count was 16. The expected count for ‘Between 101 and 999’ videos in ‘Yes’ removable media was used was 25.1 however, the final count was 35.

For the ‘1000 or More’ variable (regarding the amount of videos retrieved), the adjusted residual for ‘No’ (removable media was not used) was -3.3, while the adjusted residual for ‘Yes’
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(removable media was used) was 3.3. The expected count for ‘1000 or More’ videos in “No” removable media was not used was 11.7 however, the final count was 4. The expected count for ‘1000 or More’ videos in ‘Yes’ removable media was used was 11.3 however, the final count was 19.

Findings from the chi-square cross-tabulations with regards to the two-way interaction between removable media and video amount concluded that removable media was used to a greater extent as video amount increased. Conclusions from the chi-square cross-tabulations do support H4.

**Exchange Variables.** Chi-square cross-tabulations were performed on the following exchange variables: P2P (peer-to-peer). As illustrated in Table 4, two-way relationships among the type of technology, the year, and the amount of images/videos were tested through chi-square cross-tabulation analyses. Table 6 illustrates the significant relationships found after performing chi-square analyses on the exchange variables. Following Table 6, greater detail will be discussed pertaining to the statistical significance and the specific variables that affect that significance.

**Year (2000, 2006) & All P2P.** In analyzing the chi-square cross-tabulations of the years (2000 and 2006) and ‘All P2P,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that the statistical significance was found regarding whether the individual did not use P2P (‘No’) or they did use P2P (‘yes’) between the 2000 and 2006 datasets.

For the “No” variable (insinuating that the individual did not use P2P), the adjusted residual for the year 2000 was 16.5, while the adjusted residual for 2006 was -16.5. The expected
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The count for “No” P2P was not used in 2000 was 279.8 however, the final count was 364. The expected count for “No” P2P was not used in 2006 was 181.2 however, the final count was 97.

Table 6
Chi-Square Cross-Tabulations for Exchange Variables of Statistical Significance

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Two-Way Interaction</th>
<th>$\chi^2$</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>H7</td>
<td>Year (2000, 2006) &amp; All Images</td>
<td>26.510***</td>
<td>5</td>
</tr>
<tr>
<td>H8</td>
<td>Year (2000, 2006) &amp; All Videos</td>
<td>326.023***</td>
<td>4</td>
</tr>
<tr>
<td>H7, H8</td>
<td>Year (2000, 2006) &amp; All P2P</td>
<td>273.681***</td>
<td>1</td>
</tr>
<tr>
<td>H7</td>
<td>All P2P &amp; All Images</td>
<td>25.425***</td>
<td>5</td>
</tr>
<tr>
<td>H8</td>
<td>All P2P &amp; All Videos</td>
<td>127.197***</td>
<td>4</td>
</tr>
</tbody>
</table>

* $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$

For the “Yes” variable (insinuating that the individual did use P2P), the adjusted residual for the year 2000 was -16.5, while the adjusted residual for 2006 was 16.5. The expected count for “Yes” P2P was used in 2000 was 86.2 however, the final count was 2. The expected count for “Yes” P2P was used in 2006 was 55.8 however, the final count was 140.

Findings from the chi-square cross-tabulations with regards to the two-way interaction between year (2000, 2006) and P2P concluded that P2P was utilized to a greater extent across years. Conclusions from the chi-square cross-tabulations do support H7 and H8.
**All P2P & All Images.** In analyzing the chi-square cross-tabulations of ‘All P2P’ and ‘All Images,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that statistical significance was found in the following categories: “Less than 50; Between 101 and 999; and 10,000 or More” of the ‘All Images’ category between the ‘All P2P’ variables. ‘All P2P’ was categorized as ‘No’ or ‘Yes’ with regard to whether images were obtained through P2P.

For the ‘Less than 50’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (P2P was not used) was 2.1, while the adjusted residual for ‘Yes’ (P2P was used) was -2.1. The expected count for ‘Less than 50’ images in “No” P2P was not used was 88.6 however, the final count was 97. The expected count for ‘Less than 50’ images in ‘Yes’ P2P was used was 25.4 however, the final count was 17.

For the ‘Between 101 and 999’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (P2P was not used) was 3.0, while the adjusted residual for ‘Yes’ (P2P was used) was -3.0. The expected count for ‘Between 101 and 999’ images in “No P2P was not used was 145.3 however, the final count was 159. The expected count for ‘Between 101 and 999’ images in ‘Yes’ P2P was used was 41.7 however, the final count was 28.

For the ‘10,000 or More’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (P2P was not used) was -3.3, while the adjusted residual for ‘Yes’ (P2P was used) was 3.3. The expected count for ‘10,000 or More’ images in “No” P2P was not used was 32.6 however, the final count was 24. The expected count for ‘10,000 or More’ images in ‘Yes’ P2P was used was 9.4 however, the final count was 18.
Findings from the chi-square cross-tabulations with regards to the two-way interaction between P2P and image amount concluded that P2P was used to a greater extent as image amount increased. Conclusions from the chi-square cross-tabulations do support H7.

**All P2P & All Videos.** In analyzing the chi-square cross-tabulations of ‘All P2P’ and ‘All Videos,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that statistical significance was found in the following categories: “None; Between 50 and 100; Between 101 and 999; and 1000 or More” of the ‘All Videos’ category between the ‘All P2P’ variables. ‘All P2P’ was categorized as ‘No’ or ‘Yes’ with regard to whether videos were obtained through P2P.

For the ‘None’ variable (regarding the amount of videos retrieved), the adjusted residual for ‘No’ (P2P was not used) was 9.3, while the adjusted residual for ‘Yes’ (P2P was used) was -9.3. The expected count for ‘None’ videos in “No” P2P was not used was 175.6 however, the final count was 216. The expected count for ‘None’ videos in ‘Yes’ P2P was used was 41.4 however, the final count was 1.

For the ‘Between 50 and 100’ variable (regarding the amount of videos retrieved), the adjusted residual for ‘No’ (P2P was not used) was -7.5, while the adjusted residual for ‘Yes’ (P2P was used) was 7.5. The expected count for ‘Between 50 and 100’ videos in “No P2P was not used was 55.8 however, the final count was 33. The expected count for ‘Between 50 and 100’ videos in ‘Yes’ P2P was used was 13.2 however, the final count was 36.

For the ‘Between 101 and 999’ variable (regarding the amount of videos retrieved), the adjusted residual for ‘No’ (P2P was not used) was -3.0, while the adjusted residual for ‘Yes’ (P2P was used) was 3.0. The expected count for ‘Between 101 and 999’ videos in “No” P2P was
not used was 33.2 however, the final count was 26. The expected count for ‘Between 101 and 999’ videos in ‘Yes’ P2P was used was 15 however, the final count was 7.5.

For the ‘1000 or More’ variable (regarding the amount of videos retrieved), the adjusted residual for ‘No’ (P2P was not used) was -4.6, while the adjusted residual for ‘Yes’ (P2P was used) was 4.6. The expected count for ‘1000 or More’ videos in “No” P2P was not used was 8.9 however, the final count was 3. The expected count for ‘1000 or More’ videos in ‘Yes’ P2P was used was 2.1 however, the final count was 8.

Findings from the chi-square cross-tabulations with regards to the two-way interaction between P2P and video amount concluded that P2P was utilized to a greater extent as video amount increased. Conclusions from the chi-square cross-tabulations do support H8.

Anonymity Variables. Chi-square cross-tabulations were performed on the following anonymity variables: password protection and encrypted files. As illustrated in Table 4, two-way relationships among the type of technology, the year, and the amount of images/videos were tested through chi-square cross-tabulation analyses. Table 7 illustrates the significant relationships found after performing chi-square analyses on the anonymity variables. Following Table 6, greater detail will be discussed pertaining to the statistical significance and the specific variables that affect that significance.

Year (2000, 2006) & Password Protection. In analyzing the chi-square cross-tabulations of the years (2000 and 2006) and ‘All Password Protection,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that the statistical significance was found regarding whether the individual did not use Password
Protection (‘No’) or they did use password protection (‘Yes’) between the 2000 and 2006 datasets.

**Table 7**  
*Chi-Square Cross-Tabulations for Anonymity Variables of Statistical Significance*

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Two-Way Interaction</th>
<th>$\chi^2$</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>H9, H11</td>
<td>Year (2000, 2006) &amp; All Images</td>
<td>26.510***</td>
<td>5</td>
</tr>
<tr>
<td>H10, H12</td>
<td>Year (2000, 2006) &amp; All Videos</td>
<td>326.023***</td>
<td>4</td>
</tr>
<tr>
<td>H9, H10</td>
<td>Year (2000, 2006) &amp; Password Protection</td>
<td>5.208**</td>
<td>1</td>
</tr>
<tr>
<td>H11, H12</td>
<td>Year (2000, 2006) &amp; Encrypted Files</td>
<td>10.473***</td>
<td>1</td>
</tr>
<tr>
<td>H11</td>
<td>Encrypted Files &amp; All Images</td>
<td>21.637***</td>
<td>5</td>
</tr>
</tbody>
</table>

*$\rho \leq 0.05$  
**$\rho \leq 0.01$  
***$\rho \leq 0.001$

For the “No” variable (insinuating that the individual did not use password protection), the adjusted residual for the year 2000 was -2.3, while the adjusted residual for 2006 was 2.3. The expected count for “No” password protection was not used in 2000 was 329.7 however, the final count was 319. The expected count for “No” password protection was not used in 2006 was 501.3 however, the final count was 512.

For the “Yes” variable (insinuating that the individual did use password protection), the adjusted residual for the year 2000 was 2.3, while the adjusted residual for 2006 was -2.3. The expected count for “Yes” password protection was used in 2000 was 41.3 however, the final
count was 52. The expected count for “Yes” password protection was used in 2006 was 62.7 however, the final count was 52.

Findings from the chi-square cross-tabulations with regards to the two-way interaction between year (2000, 2006) and password protection concluded that password protection was utilized to a lesser extent across years. Conclusions from the chi-square cross-tabulations do not support H9 or H10.

**Year (2000, 2006) & Encrypted Files.** In analyzing the chi-square cross-tabulations of the years (2000 and 2006) and ‘All Encrypted Files,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that the statistical significance was found regarding whether the individual did not use encryption (‘No’) or they did use encryption (‘yes’) between the 2000 and 2006 datasets.

For the “No” variable (insinuating that the individual did not use encryption), the adjusted residual for the year 2000 was -3.2, while the adjusted residual for 2006 was 3.2. The expected count for “No” encryption was not used in 2000 was 354.7 however, the final count was 345. The expected count for “No” encryption was not used in 2006 was 547.3 however, the final count was 557.

For the “Yes” variable (insinuating that the individual did use encryption), the adjusted residual for the year 2000 was 3.2, while the adjusted residual for 2006 was -3.2. The expected count for “Yes” encryption was used in 2000 was 15.3 however, the final count was 25. The expected count for “Yes” encryption was used in 2006 was 23.7 however, the final count was 14.

Findings from the chi-square cross-tabulations with regards to the two-way interaction between year (2000, 2006) and encrypted files concluded that encryption was utilized to a lesser
extent across years. Conclusions from the chi-square cross-tabulations do not support H11 or H12.

**Encrypted Files & All Images.** In analyzing the chi-square cross-tabulations of ‘All Encrypted Files’ and ‘All Images,’ results revealed that a statistical significance does exist within this two-way relationship. Further analyzing revealed that statistical significance was found in the following categories: “Less than 50; and 10,000 or More” of the ‘All Images’ category between the ‘All Encrypted Files’ variables. ‘All Encrypted Files’ was categorized as ‘No’ or ‘Yes’ with regard to whether images were encrypted.

For the ‘Less than 50’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (encryption was not used) was 2.4, while the adjusted residual for ‘Yes’ (encryption was used) was -2.4. The expected count for ‘Less than 50’ images in “No” encryption was not used was 179.2 however, the final count was 185. The expected count for ‘Less than 50’ images in ‘Yes’ encryption was used was 7.8 however, the final count was 2.

For the ‘10,000 or More’ variable (regarding the amount of images retrieved), the adjusted residual for ‘No’ (encryption was not used) was -3.8, while the adjusted residual for ‘Yes’ (encryption was used) was 3.8. The expected count for ‘10,000 or More’ images in “No” encryption was not used was 55.6 however, the final count was 50. The expected count for ‘10,000 or More’ images in ‘Yes’ encryption was used was 2.4 however, the final count was 8.

Findings from the chi-square cross-tabulations with regards to the two-way interaction between encrypted files and image amount concluded that encryption was utilized to a greater extent as image amount increased. Conclusions from the chi-square cross-tabulations do support H11.
CHAPTER VI

DISCUSSION

Based on the findings previously discussed, it can be concluded that all hypotheses (H1-H12) were rejected following the log linear analyses, concluding that the null hypotheses were accepted. As a result of the rejection of the hypotheses, it was determined that chi-square cross-tabulation analyses should be run to determine whether a statistically significant relationship could be determined as a two-way interaction, instead of a three-way interaction (as illustrated in the log linear analyses). These chi-square analyses produced significant findings within the following three areas: storage, exchange, and anonymity. The following sections discuss the significant two-way relationships observed amongst the storage, exchange, and anonymity dimensions. The chi-square cross-tabulations for Year (2000, 2006) and All Images, as well as Year (2000, 2006) and All Videos, were significant and were related to storage, exchange, and anonymity. Thus, the discussion of those analyses will be discussed before discussing the results of the storage, exchange, and anonymity variables, since year (2000, 2006), images, and videos relate to all three categories. Table 8 illustrates the results of the number of images/videos with relation to the 2000/2006 datasets. Following the table, greater detail will discuss the results illustrated in Table 8.

The chi-square cross-tabulations for the combination of both years (2000, 2006) and ‘All Images’ resulted in statistical significance across years. However, results of these tests do not show a direct relationship of increased image amounts from 2000 to 2006. This can be illustrated by the fact that for image counts ‘Less than 50,’ the adjusted residual in 2000 was 2.2; however the adjusted residual in 2006 was -2.2. With image counts of ‘Between 50 and 100’ in 2000, the adjusted residual was -4.0; however the adjusted residual in 2006 was 4.0. With image counts of
‘Between 101 and 999,’ the adjusted residual in 2000 was 2.8; however the adjusted residual in 2006 was -2.8. These results conclude that there was no statistical relationship supporting a direct increase in image amounts across years. This indicates that in 2000, these types of offenders were already storing large amounts of images relative to the amounts that they stored in 2006. This could be attributed to the amount of images already available in 2000 or to the storage capabilities offered in 2000.

Table 8
Results from Chi-Square Cross-Tabulations for Amount Variables of Statistical Significance

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Two-Way Interaction</th>
<th>Results</th>
<th>Support Hypothesis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMOUNT OF IMAGES/VIDEOS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1, H3, H5, H7, H9, H11</td>
<td>Year (2000, 2006) &amp; All Images</td>
<td>Amount of images did not increase across years</td>
<td>No</td>
</tr>
<tr>
<td>H2, H4, H6, H8, H10, H12</td>
<td>Year (2000, 2006) &amp; All Videos</td>
<td>Amount of videos increased across years</td>
<td>Yes</td>
</tr>
</tbody>
</table>

The chi-square cross-tabulations for the combination of both years (2000, 2006) and ‘All Videos’ resulted in statistical significance across years. Specifically, results of these tests indicate that increased video amounts tend to increase from 2000 to 2006. This can be illustrated by the fact that for video counts ‘None,’ the expected count of users in 200 was 133.2, however the actual count of individuals in 2000 with no videos was determined to be 244 (adjusted residual of 17.2). Contrastingly, in 2006 with regard to the video category of ‘None,’ the expected count of individuals having no videos was 118.8; however the actual count was 8 (adjusted residual of -17.2). However, as video amounts increase, the adjusted residuals for 2000 indicate negative results, while the adjusted residuals for 2006 indicate positive results. This
confirms that videos stored increase from 2000 to 2006. This can further be illustrated by the category ‘1000 or More.’ In 2000 the expected users for having ‘1000 or more’ videos was 12.7, however the actual count was determined to be 2 (adjusted residual of -4.4). Contrastingly, the expected users possessing ‘1000 or More’ videos in 2006 was 11.3, however the actual count was 22 (adjusted residual of 4.4). Thus further illustrates the notion that as time progressed (2000 to 2006), amount of videos stored increased.

Storage

With regard to storage, the primary technological variables measuring storage include: hard drives, removable media, and remote storage. Results revealed that hard drives had a significant impact on number of images, hard drives a significant impact on number of videos, year (2000, 2006) had a statistical significance on removable media, removable media had a statistical significance on images, and removable media had an impact on videos. It should be noted that remote storage did not produce any statistically significant results in conjunction with year, images, or videos. Specific results indicate that (1) hard drives are used to a greater extent as image amount increases; (2) hard drives are used to a greater extent as video amount increases; (3) removable media was used to a lesser extent across years; (4) removable media is used to a greater extent as image amount increases; and (5) removable media is used to a greater extent as video amount increases. Table 9 describes the results from the chi-square cross-tabulations as they relate to the storage variables, as well as whether the results support the original hypotheses as a two-way relationship. Following the table, a brief discussion of each result will be discussed.
Table 9
Results from Chi-Square Cross-Tabulations for Storage Variables of Statistical Significance

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Two-Way Interaction</th>
<th>Results</th>
<th>Support Hypothesis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>All Hard Drives &amp; All Images</td>
<td>Hard drives are used to a greater extent as image amount increases</td>
<td>Yes</td>
</tr>
<tr>
<td>H2</td>
<td>All Hard Drives &amp; All Videos</td>
<td>Hard drives are used to a greater extent as video amount increases</td>
<td>Yes</td>
</tr>
<tr>
<td>H3, H4</td>
<td>Year (2000, 2006) &amp; All Removable Media</td>
<td>Removable media was used to a lesser extent across years</td>
<td>No</td>
</tr>
<tr>
<td>H3</td>
<td>All Removable Media &amp; All Images</td>
<td>Removable media is used to a greater extent as image amount increases</td>
<td>Yes</td>
</tr>
<tr>
<td>H4</td>
<td>All Removable Media &amp; All Videos</td>
<td>Removable media is used to a greater extent as video amount increases</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Based on the chi-square cross-tabulations of images from both years and hard drive usage from both years, results indicate that there is a relationship between increased number of images and usage of hard drives. Specifically, as the number of images increase, the utilization of hard drives is greater. This can be illustrated by the fact that for image counts ‘Less than 50,’ the expected count of users utilizing hard drives was 185.6, however the actual count of individuals using hard drives was determined to be 169 (adjusted residual of -4.0). Contrastingly, with regard to the image category of ’10,000 or more,’ the expected count of individuals using hard drives was 51.9; however the actual count was 58 (adjusted residual of 2.5). This confirms that the two-way relationship between image count and utilization of hard drives is significant in that hard drives are used to a greater extent when dealing with larger image amounts.
Based on the chi-square cross-tabulations of videos from both years and hard drive usage from both years, results indicate that there is a relationship between increased number of videos and usage of hard drives. Specifically, as the number of videos increase, the utilization of hard drives is greater. This can be illustrated by the fact that for video counts ‘Less than 50,’ the expected count of users utilizing hard drives was 249.6, however the actual count of individuals using hard drives was determined to be 241 (adjusted residual of -2.0). Contrastingly, with regard to the video category of ‘Between 50 and 100,’ the expected count of individuals using hard drives was 102.8; however the actual count was 112 (adjusted residual of 2.8). This confirms that the two-way relationship between video count and utilization of hard drives is significant in that hard drives are used to a greater extent when dealing with larger video amounts.

Based upon the chi-square cross-tabulations of year (2000, 2006) and removable media from both years, results reveal that removable media was used to a greater extent than expected in 2000 than in 2006. This can be illustrated by the fact that 179.7 individuals were expected to use removable media in 2000, yet 201 in fact utilized removable media (adjusted residual of 2.8). Contrastingly, the expected count for users employing removable media in 2006 was 257.3, yet the final count of individuals using removable media was 236 (adjusted residual of -2.8). This confirms that the two-way relationship between year (2000, 2006) and removable media is significant in that removable media was used greater in 2000 than in 2006 than previously expected. These results contrast anticipated findings. Such mixed results could be attributed to the fact that removable media was a widely employed technology that had already gained significant momentum in 2000. An additional reason for this result could also be attributed to the fact that the specific question utilized for this study did not differentiate between various types of
removable media, such as floppy disks, CD-ROMs, CDs, or flash drives. Removable media devices such as floppy disks were widely accepted and used during 2000, whereas flash drives may have been used greater in 2006. Future research should specifically note the various types of removable media being utilized by these types of offenders. By noting the various types of removable media being utilized, one can discern the type of removable media preferred by these types of offenders, as well as the amount of storage capability on that removable media. Floppy disks may have been of greater popularity in 2000 than flash drives, however storage capabilities on flash drives are far greater than storage capabilities on floppy disks. Future research should specifically target the types of removable media devices used, as well as the amounts of images/videos stored on those removable media devices.

Based on the chi-square cross-tabulations of images from both years and removable media usage from both years, results indicate that there is a relationship between increased number of images and usage of removable media. Specifically, as the number of images increase, the utilization of removable media is greater. This can be illustrated by the fact that for image counts ‘Less than 50,’ the expected count of users utilizing removable media was 91, however the actual count of individuals using removable media was determined to be 53 (adjusted residual of -6.1). Contrastingly, with regard to the image category of ’10,000 or more,’ the expected count of individuals using removable media was 26; however the actual count was 47 (adjusted residual of 5.7). This confirms that the two-way relationship between image count and utilization of removable media is significant in that removable media is used to a greater extent when dealing with larger image amounts.

Based on the chi-square cross-tabulations of videos from both years and removable media usage from both years, results indicate that there is a relationship between increased number of
videos and usage of removable media. Specifically, as the number of videos increase, the utilization of removable media is greater. This can be illustrated by the fact that for video counts ‘None,’ the expected count of users utilizing removable media was 119.6, however the actual count of individuals using removable media was determined to be 107 (adjusted residual of -2.0). Contrastingly, with regard to the video category of ’1,000 or more,’ the expected count of individuals using removable media was 11.3; however the actual count was 19 (adjusted residual of 3.3). This confirms that the two-way relationship between video count and utilization of removable media is significant in that removable media is used to a greater extent when dealing with increased video amounts.

**Exchange**

With regard to exchange, the primary technological variable measuring exchange was P2P. Results revealed that P2P had a significant impact on year, number of images, and number of videos. Specific results indicate that (1) P2P was utilized to a greater extent across years; (2) P2P was used more as image amount increased; and (3) P2P was used more as video amount increased. Table 10 describes the results from the chi-square cross-tabulations as they relate to the exchange variables, as well as whether the results support the original hypotheses as a two-way relationship. Following the table, a brief discussion of each result will be discussed.

Based upon the chi-square cross-tabulations of year (2000, 2006) and P2P from both years, results reveal that P2P was used to a far greater extent in 2006 than in 2000. This can be illustrated by the fact that 86.2 individuals were expected to use P2P in 2000, yet only 2 in fact utilized P2P (adjusted residual of -16.5). Contrastingly, the expected count for users employing P2P in 2006 was 55.8, yet the final count of individuals using P2P was 140 (adjusted residual of
This confirms that the two-way relationship between year (2000, 2006) and P2P is significant in that P2P was used far greater in 2006 than in 2000.

Table 10
Results from Chi-Square Cross-Tabulations for Exchange Variables of Statistical Significance

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Two-Way Interaction</th>
<th>Results</th>
<th>Support Hypothesis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>H7, H8</td>
<td>Year (2000, 2006) &amp; All P2P</td>
<td>P2P was utilized to a greater extent across years</td>
<td>Yes</td>
</tr>
<tr>
<td>H7</td>
<td>All P2P &amp; All Images</td>
<td>P2P was used more as image amount increased</td>
<td>Yes</td>
</tr>
<tr>
<td>H8</td>
<td>All P2P &amp; All Videos</td>
<td>P2P was used more as video amount increased</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Based on the chi-square cross-tabulations of images from both years and P2P usage from both years, results indicate that there is a relationship between increased number of images and usage of P2P. Specifically, as the number of images increase, the utilization of P2P is greater. This can be illustrated by the fact that for image counts ‘Between 101 and 999,’ the expected count of users utilizing P2P was 41.7, however the actual count of individuals using P2P was determined to be 28 (adjusted residual of -3.0). Contrastingly, with regard to the image category of ’10,000 or more,’ the expected count of individuals using P2P was 9.4; however the actual count was 18 (adjusted residual of 3.3). This confirms that the two-way relationship between image count and utilization of P2P is significant in that P2P is used to a greater extent when dealing with larger image amounts.

Based on the chi-square cross-tabulations of videos from both years and P2P usage from both years, results indicate that there is a relationship between increased number of videos and usage of P2P. Specifically, as the number of videos increase, the utilization of P2P is greater.
This can be illustrated by the fact that for video counts ‘None,’ the expected count of users utilizing P2P was 41.4, however the actual count of individuals using P2P was determined to be 1 (adjusted residual of -9.3). Contrastingly, with regard to the video category of ’1,000 or more,’ the expected count of individuals using P2P was 2.1; however the actual count was 8 (adjusted residual of 4.6). This confirms that the two-way relationship between video count and utilization of P2P is significant in that P2P is used to a greater extent when dealing with larger video amounts.

**Anonymity**

With regard to anonymity, the primary technological variables measuring anonymity were password protection and encrypted files. Results revealed that password protection had a significant impact on year, that encrypted files had a significant impact on year, and encrypted files had a significant impact on images. Specific results indicate that (1) password protection was utilized to a lesser extent across years; (2) encryption was utilized to a lesser extent across years; and (3) encrypted files were used greater as image amount increased. Table 11 describes the results from the chi-square cross-tabulations as they relate to the anonymity variables, as well as whether the results support the original hypotheses as a two-way relationship. Following the table, a brief discussion of each result will be discussed.

Based upon the chi-square cross-tabulations of year (2000, 2006) and password protection from both years, results reveal that password protection was used to a greater extent in 2000 than in 2006. This can be illustrated by the fact that 41.3 individuals were expected to use password protection in 2000, yet 52 in fact utilized password protection (adjusted residual of 2.3). Contrastingly, the expected count for users employing password protection in 2006 was 62.7, yet the final count of individuals using password protection was 52 (adjusted residual of -
2.3). This confirms that the two-way relationship between year (2000, 2006) and password protection is significant in that password protection was used greater in 2000 than in 2006. These results contrast anticipated findings. Such mixed results could be attributed to the fact that password protection was an accepted and widely employed technology that had already gained great momentum in 2000. An additional reason for this result could also be attributed to the fact that these types of offenders go to extra precautionary measures in attempts to hide their possessed child pornography. It could be argued that if the technology of password protection was widely available in 2000, then it would have been strongly implemented by these types of offenders in attempts to hide their contraband.

**Table 11**

*Results from Chi-Square Cross-Tabulations for Anonymity Variables of Statistical Significance*

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Two-Way Interaction</th>
<th>Results</th>
<th>Support Hypothesis?</th>
</tr>
</thead>
<tbody>
<tr>
<td>H9, H10</td>
<td>Year (2000, 2006) &amp; Password Protection</td>
<td>Password protection was utilized to a lesser extent across years</td>
<td>No</td>
</tr>
<tr>
<td>H11, H12</td>
<td>Year (2000, 2006) &amp; Encrypted Files</td>
<td>Encryption was utilized to a lesser extent across years</td>
<td>No</td>
</tr>
<tr>
<td>H11</td>
<td>Encrypted Files &amp; All Images</td>
<td>Encrypted files were used greater as image amount increased</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Based upon the chi-square cross-tabulations of year (2000, 2006) and encrypted files from both years, results reveal that encrypted files was used to a greater extent in 2000 than in 2006. This can be illustrated by the fact that 15.3 individuals were expected to use encryption in 2000, yet 25 individuals in fact utilized encryption (adjusted residual of 3.2). Contrastingly, the expected count for users employing encryption in 2006 was 23.7, yet the final count of individuals using password protection was 14 (adjusted residual of -3.2). This confirms that the
two-way relationship between year (2000, 2006) and encryption is significant in that encryption was used greater in 2000 than in 2006. These results contrast anticipated findings. Such mixed results could be attributed to the fact that encryption was a widely employed technology that had already gained great momentum in 2000. An additional reason for this result could also be attributed to the fact that these types of offenders go to extra precautionary measures in attempts to hide their possessed child pornography. It could be argued that if the technology of encryption was widely available in 2000, then it would have been strongly implemented by these types of offenders in attempts to hide their child pornography.

Based on the chi-square cross-tabulations of images from both years and encryption usage from both years, results indicate that there is a relationship between increased number of images and usage of encryption. Specifically, as the number of images increase, the utilization of encryption is greater. This can be illustrated by the fact that for image counts ‘Less than 50,’ the expected count of users utilizing encryption was 7.8, however the actual count of individuals using encryption was determined to be 2 (adjusted residual of -2.4). Contrastingly, with regard to the image category of ’10,000 or more,’ the expected count of individuals using encryption was 2.4; however the actual count was 8 (adjusted residual of 3.8). This confirms that the two-way relationship between image count and utilization of encryption is significant in that encryption is used to a greater extent when dealing with larger image amounts.
CHAPTER VII

CONCLUSION AND POLICY IMPLICATIONS

Conclusions of this study yield significant results that can add to existing literature regarding online sex offenders that possess or distribute child pornography. Through analyzing results of the tests performed within this study, it was determined that three-way relationships among technological variables, year (2000, 2006), and image/video amount did not produce statistically significant results. However, two-way relationships among these variables did return significant results with regard to the extent to which the utilization of technology further facilitates the possession of online child pornography.

Hard drives, removable media, P2P and encryption were all identified as having statistically significant relationships to either increased image/video amount or increased usage of that technology over time. Specifically, P2P was identified as having a statistically significant relationship to increased usage over time (2000, 2006). This confirms other research indicating that P2P networks have gained significant attention over time by child pornographers in exchanging child pornography (Wortley & Smallbone, 2010).

Additionally, hard drives, removable media, P2P, and encryption were all identified as having statistically significant relationships to increased image/video amount. Based on the present study, the conclusion that hard drives and removable media do have a statistically significant relationship to increased image/video amount relates to what other research has found. Such research states that these offenders are utilizing a variety of storage techniques in attempts to organize or increase their child pornography collections; Carr (2004) found that in his sample, 86% of the sample had stored their images on a hard drive, with 29% also utilizing
floppy disks and 14% using CD-ROMs. Finally, the findings revealing that encryption does have a statistically significant relationship with increased image/video amounts have been suggested by previous research. Specifically, prior research has found that the utilization of encryption has gained momentum within the possession and distribution realm of online child pornography, especially among collectors of child pornography (Krone, 2004).

Remote storage and password protection were identified as not having a significant relationship with either increased images/videos or increased usage over time. Conclusions of this study do reveal that certain technologies are aiding in the growth of this crime. The following section discusses policy implications based on these findings.

**Policy Implications**

Conclusions of this research can lead to significant policy implications. If technology is facilitating the increased distribution and possession of child pornography, then significant implications attempts to curtail such growth can be made. If the notion that technology is assisting these types of offenders to victimize children at higher rates, then it could be argued that the same technology should be utilized in an attempt to curb these offenses. While these offenders are continuously employing improved technology in attempts to facilitate their desires, so should law enforcement exploit the same advances in technology in attempts to catch such offenders. In the same manner in which technology and the Internet has increased this significant issue, the Internet has also provided exponential potential for detecting these crimes. By using technological advances such as, facial recognition software, online undercover techniques, and other advancements, it will be far more beneficial to combat these types of crimes with the same technologies that are being utilized by the offenders.
Furthermore, if Internet-related child exploitation is growing due to technology, it would be beneficial to raise awareness to the public concerning this growing issue. If a larger proportion of the general public had a heightened awareness and understanding of this problem, then there could be greater attempts to eradicate this crisis. In much the same way that there have been paradigm shifts raising awareness to issues such as human trafficking, a similar sort of paradigm shift could potentially have the same positive effects on this growing problem of distributing child pornography. If technology is in fact aiding in an increase in these types of offenses, the source of the problem cannot be eliminated. Technology will continue to expand and grow. Thus, it is necessary to raise awareness of this growing problem, so that it is not only law enforcement making efforts to curb this problem, but the public as well. By employing methods granted through technology, such as Facebook, YouTube, Twitter, blogs, and other websites, such platforms have the potential of spreading this issue.

Furthermore, if such a paradigm shift did occur, it would bring greater accountability on the court systems to realize the severity of these acts and hopefully impose harsher punishments on these types of offenders. With such heightened awareness of this pervasive problem, it would be hoped that these types of offenders would no longer be seen as not physically “hurting” anyone. With greater understanding of the problem and the lifelong repercussions experienced by the victims, it is hoped that the courts would impose harsher sanctions such as those seen by contact sex offenders.

By employing a greater use of technology in attempts to catch offenders, by enlightening the general public of the growth and severity of this problem, and by initiating harsher sanctions once these offenders are within the system, it is the hope that attempts can be initiated to begin to curb this continually growing problem. If action is not taken, then these offenders will continue
to exploit children, as has been seen since the initiation of the Internet. The numbers have continually grown as technology has continually aided a platform for these types of offenders to continually offend. It is the responsibility of those who have acknowledged and seen the severity of this problem to raise awareness and makes attempts to further protect our children and serve justice.

**Limitations of this Research**

The most significant limitation of this research is that the data was obtained through secondary data analysis. Given that data was not collected specifically for this research topic, this may result in skewed results. Furthermore, because this research was secondary data analysis, all of the limitations that existed within both N-JOV studies are also reflected within this study.

An additional limitation of this research was that only variables that were specifically addressed within the N-JOV studies could be addressed within the present study. This limited the specific technologies used as variables within the present study to exclusively include the variables included within the original N-JOV studies. Additionally, the categorization used within the N-JOV studies was identified as problematic within the present study. For instance, removable media included all removable devices such as floppy disks, CD-ROMs, CDs, and flash drives. For the present study, it would have been more beneficial for these categories to have been separated. This would have allowed observation of varied removable media selections across time. For example, were flash drives used more widely in 2006 than in 2000?

**Future Direction of Research**

As the problem of online child pornography continually grows, it is imperative that future research attempts acknowledge the prevalence of this issue and continue to research ways to control it. Specifically, research should focus on ways that law enforcement can utilize
technology in further attempts to catch these offenders. If law enforcement takes a more proactive stance on this issue, then it is hoped that these offenders will recognize increased chances of detection and will lessen their online activity.

A predominant concern regarding the growth of online child pornography relates to the question as to whether these online offenders pose a risk for initiating contact offenses. Much existing research has addressed this issue by comparing the characteristics of online offenders and contact offenders (Webb, Craissati, & Keen, 2007; McCarthy, 2010; Elliott, Beech, Mandeville-Norden, Hayes, 2009; Seto, Hanson, & Babchishin, 2011; Bourke & Hernandez, 2009). Future research should specifically address whether it is these types of individuals that become “de-sensitized” to child pornography that pose a significant threat of crossing-over to make contact offenses.

Further research should also continue addressing the extent to which technology is further facilitating an increase in these types of offenses. Future research endeavors should hone in on more specific technological advances and should address wider time spans. This would allow researchers to examine utilizations of technology across larger time spans.
Appendix A

Selected Questions from 2000 N-JOV Study

1. About how many graphic sexual IMAGES of children were found? Would you say…
   1. None
   2. Less than 50
   3. Between 50 and 100
   4. Between 101 and 999
   5. Between 1000 and 9,999
   6. Between 10,000 and 99,999
   7. 100,000 or more
   97. DK
   98. NA/ REFUSED
   99. NOT APP

2. About how many graphic sexual VIDEOS of children were found? Would you say…
   1. None
   2. Less than 50
   3. Between 50 and 100
   4. Between 101 and 999
   5. Between 1000 and 9,999
   6. Between 10,000 and 99,999
   7. 100,000 or more
   97. DK
   98. NA/ REFUSED
   99. NOT APP

3. Was child pornography found on a hard drive of a desktop or laptop computer?
   1. Yes
   2. No
   97. DK
   98. NA/ REFUSED
   99. NOT APP

4. Was child pornography found on removable media like computer disks or CDs?
   1. Yes
   2. No
   97. DK
   98. NA/ REFUSED
   99. NOT APP

5. Was the offender using any sophisticated methods to store or hide images such as remote storage like on a website?
   1. Yes
6. Was the offender using any sophisticated methods to store or hide images such as peer to peer networks?
   1. Yes
   2. No
   97. DK
   98. NA/ REFUSED
   99. NOT APP

7. Was the offender using any sophisticated methods to store or hide images such as password protection?
   1. Yes
   2. No
   97. DK
   98. NA/ REFUSED
   99. NOT APP

8. Was the offender using any sophisticated methods to store or hide images such as encryption?
   1. Yes
   2. No
   97. DK
   98. NA/ REFUSED
   99. NOT APP

9. Is the offender male or female?
   1. Male
   2. Female
   97. DK
   98. NA/ REFUSED
   99. NOT APP

10. What was the offender’s age when the crime started?  
    _________ AGE
    97. DK
    98. NA/ REFUSED
    99. NOT APP

11. What is the offender’s race?
    1. White
    2. African-American
    3. Asian
4. Native American
5. Other
97. DK
98. NA/REFUSED
99. NOT APP

12. What kind of area did the offender live in at the time of the crime (as far as you know)?
   1. Urban
   2. Suburban
   3. A large town of 25,000 to 100,000 people
   4. A small town
   5. Rural
   97. DK
   98. NA/REFUSED
   99. NOT APP

13. How much schooling did the offender have (as far as you know)?
   1. Not finish high school
   2. Graduate high school
   3. Have some college education
   4. Graduate college
   5. Have a post college degree
   6. Have technical training
   7. Some other schooling
   97. DK
   98. NA/REFUSED
   99. NOT APP

14. What was the offender’s marital status at the time of the crime (as far as you know)?
   1. Single, never married
   2. Married
   3. Living with a partner
   4. Separated
   5. Divorced
   6. Widowed
   7. Other
   97. DK
   98. NA/REFUSED
   99. NOT APP

15. Did the offender have any prior arrests for sexual offending (as far as you know)?
   1. Yes
   2. No
   97. DK
   98. NA/REFUSED
   99. NOT APP
Appendix B

**Selected Questions from 2006 N-JOV Study**

1. How many (still) images were found (not including any produced images)? (Your best estimate is fine).
Enter number of images below.
   97. DK
   98. NA/ REFUSED
   99. NOT APP

2. How many videos or DVDs were found (not including any produced images)? (Your best estimate is fine).
Enter number of videos below.
   97. DK
   98. NA/REFUSED
   99. NOT APP

3. Was child pornography found on a hard drive of a desktop or laptop computer?
   1. Yes
   2. No
   97. DK/NOT SURE
   98. NA/ Refused
   99. Not Applicable

4. Was child pornography found on removable media like computer disks, CDs, or thumb drives?
   1. Yes
   2. No
   97. DK/NOT SURE
   98. NA/ Refused
   99. Not Applicable

5. Was the offender using any sophisticated methods to store or hide images such as remote storage, like on a website?
   1. Yes
   2. No
   97. DK/NOT SURE
   98. NA/ Refused
   99. Not Applicable

6. Did the offender distribute the produced images through a peer to peer network (file sharing)?
   1. Yes
   2. No
7. Was the offender using any sophisticated methods to store or hide images such as password protection?
   1. Yes
   2. No
   97. DK/NOT SURE
   98. NA/Refused
   99. Not Applicable

8. Was the offender using any sophisticated methods to store or hide images such as encrypted files?
   1. Yes
   2. No
   97. DK/NOT SURE
   98. NA/Refused
   99. Not Applicable

9. What is the sex of the primary offender: male or female?
   1. Male
   2. Female
   97. DK/Not Sure
   98. NA/Refused
   99. Not Applicable

10. And how old was the (primary) offender (at the time the crime started)?
    1. Younger than 16
    2. 16-17 yrs old
    3. 18-21 yrs old
    4. 22-25 yrs old
    5. 26-29 yrs old
    6. 30-39 yrs old
    7. 40-49 yrs old
    8. 50-59 yrs old
    9. 60 or older
   97. DK/Not Sure
   98. NA/Refused
   99. Not Applicable

11. Please tell me the race of the offender.
    1. White
    2. Black
    3. Asian
    4. Native American/Alaskan Native
5. Mixed Race
6. Other
97. DK/Not Sure
98. NA/Refused
99. Not Applicable

12. What kind of area did the offender live in at the time of the crime (as far as you know)?
   1. Urban
   2. Suburban
   3. A large town of 25,000 to 100,000 people
   4. A small town
   5. Rural
   97. DK/Not Sure
   98. NA/Refused
   99. Not Applicable

13. How much schooling did the offender have (as far as you know)?
   1. Did not finish high school
   2. Graduated high school
   3. Had some college education or technical training
   4. Graduated college
   5. Has a post college degree
   97. DK/Not Sure
   98. NA/Refused
   99. Not Applicable

14. What was the offender’s marital status at the time of the crime (as far as you know)?
   1. Single, never married
   2. Married
   3. Living with a partner
   4. Separated, divorced, or widowed
   5. Other
   97. DK/Not Sure
   98. NA/Refused
   99. Not Applicable

15. Did the offender have any prior arrests for sexual offending (as far as you know)?
   1. Yes
   2. No
   97. DK/Not Sure
   98. NA/Refused
   99. Not Applicable
Appendix C

New Variable Names for 2000 and 2006 N-JOV Datasets

<table>
<thead>
<tr>
<th>Old Variable</th>
<th>New Variable</th>
<th>Old Variable</th>
<th>New Variable</th>
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</thead>
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<td>HardDrives00</td>
<td>CP01a</td>
<td>HardDrives06</td>
</tr>
<tr>
<td>cp1b</td>
<td>RemovableMedia00</td>
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<td>Images00</td>
<td>CP23c</td>
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References


Child Pornography Protection Act (18 U.S.C. §§ 2252A, 2256(8))

Child Protection Act (18 U.S.C. §§ 2251, 2252, et seq.)

Child Protection and Obscenity Enforcement Act (amending §§ 2251, 2252)

Child Protector and Sexual Predator Punishment Act (42 U.S.C. §§ 13032)


Sexual Exploitation of Children Act (Pub.L. 95-225, 92 Stat. 7)


