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"Addicted to pillaging in cyberspace: Investigating the role of internet addiction in digital piracy" *Computers in Human Behavior* volume 37 pp. 101-106 Version of record available @ (<http://dx.doi.org/10.1016/j.chb.2014.04.012>)

Addicted to pillaging in cyberspace: Investigating the role of internet addiction in digital piracy

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a b s t r a c t

The present exploratory study sought to address a gap in the current literature on problematic Internet use by investigating the relationship between Internet addiction and digital piracy. The main research question guiding this study was whether IA was correlated with digital piracy. The expectation was that IA would indeed be correlated with digital piracy and increase odds of perpetration. Secondly, taking into account that previous literature on both IA and digital piracy emphasizes the importance of online relationships (Acier & Kern, 2011; Fitzpatrick, 2008; Marcum, Higgins, Wolfe, & Ricketts, 2011), it was expected that deviant peer association would increase the odds of pirating. Finally, taking into account that previous research on both IA and digital piracy has largely shown that these problems affect a greater proportion of males (Andreou & Svoli, 2013; Gunter, Higgins, & Gealt, 2010; Hinduja, 2012; Lam, Peng, Mai, & Jing, 2009; Shaw & Black, 2008), it was expected that being male would increase the odds of pirating.

1. Introduction

The rapid advancement of technology has resulted in substantial benefits for society, such as new outlets and venues for individuals to express themselves and share information. However, a negative consequence of this rapid advancement is the development of innovative methods to find, copy, and use intellectual property without providing payment (Higgins, Wolfe, & Marcum, 2008; Hinduja, 2012; Marcum et al., 2011). According to Siwek (2007), the annual costs from sound recording piracy alone are staggering: \$12.5 billion lost in the U.S. economy, \$2.7 billion lost in earnings (e.g. sound recording industry workers), 71,000 jobs lost, and \$422 million dollars lost in potential tax revenue. To address this serious social problem, digital piracy has been evaluated using several important criminological perspectives: General Strain Theory (Hinduja, 2012), Rational Choice Theory (Higgins, 2007), and Self-Control Theory (Higgins, 2007; Higgins et al., 2008; Marcum et al., 2011). And, while findings regarding the aforementioned theoretical perspectives add much to existing

literature, one substantial gap in knowledge remains: whether individuals pirate digital material due to an underlying addiction to the Internet in general.

In order to address this gap, this study explored the role of Internet Addiction in the perpetration of digital piracy. While research on Internet Addiction is largely still in a nascent stage, several scholars have highlighted the need for increased empirical attention to this issue (Caplan & High, 2011; Chakraborty, Basu, & Kumar, 2010; Young, 1998, 2011) – particularly by investigating specific areas of troubling behavior in which Internet Addiction may play a role (Griffiths, 2010). Therefore, this study focused on a topic ripe for investigation, which has not been previously addressed (to the best of our knowledge). However, before discussing the results of this study, a review of the relevant literature is warranted.

2. Internet addiction

The rapid advancement of technology has not only led to innovations in the perpetration of criminal behavior, but has also potentially led to a new disorder: Internet Addiction (IA; (Young, 1998). Allowing for minor variations, IA refers to a user's problematic utilization of the Internet that is both time-consuming and detrimental to his/her functioning in important life domains

(Chakraborty et al., 2010). While some refer to this problem as IA (Andreou & Svoli, 2013; Aydin & Sari, 2011; Chakraborty et al., 2010; Christakis, 2010) others have also used the term “problematic internet use” or PIU (Acier & Kern, 2011; Billieux & Van der Linden, 2012; Caplan & High, 2011). Regardless of the term utilized, studies on problematic Internet use began emerging in the mid-1990s (Andreou & Svoli, 2013); however, the earliest reports actually date back to the 1970s and focused on the overuse of computers in general (Shaw & Black, 2008).

One of the earliest empirical studies on IA was conducted by Dr. Kimberly Young (1998), who utilized the Diagnostic and Statistical Manual of Mental Disorders (DSM) IV criteria specific to pathological gambling in order to investigate troubling online behavior. Young’s (1998) results indicated that dependent users of the Internet reported poor time management compared to non-dependent users. Moreover, dependent users’ Internet use also resulted in negative consequences within their personal, familial, and occupational lives (Young, 1998). Examples noted by Young (1998) included disruption caused to child-parent relationships and interpersonal relationships. Following Young’s (1998) seminal study, other scholars continued to investigate this problem.

Since Young’s (1998) study, evidence of IA have been found in studies conducted within the United States as well as internationally (Acier & Kern, 2011; Andreou & Svoli, 2013; Ha et al., 2007; Young & de Abreu, 2010). However, precise prevalence rates are difficult to determine due to the various methodological challenges: inconsistent criteria, lack of a uniform definition, and sampling bias concerns (Chakraborty et al., 2010; Shaw & Black, 2008; Weinstein & Lejoyeux, 2010). Despite these challenges, in one comprehensive review of IA surveys published between 2000 and 2009, prevalence rates ranged from 1.5% to 8.2% in the United States and Europe (Weinstein & Lejoyeux, 2010). In a similar review of the literature from 1970 to 2010, the prevalence rates of IA ranged from .3% to 38% (Chakraborty et al., 2010). Thus, while it is important to acknowledge the methodological challenges across studies, scholars have claimed that evidence of the problem exists and that ignoring this evidence of IA “... only trivializes and stigmatizes attempts to understand and treat it” (Shaw & Black, 2008, p.3).

Although there is a scant amount of literature on this fairly new phenomenon, there has been comparison of different societies in regard to IA. A cross-national study examined the differences in IA experiences with Chinese and American university students (Zhang, Amos, & McDowell, 2008). Results indicated that Chinese university students experienced IA at a higher rate, but males in both nations were more likely to have experiences with IA compared to females. However, variables considered “Internet experience” (e.g. time spent online) were not significantly related to IA in either nation.

The methodological challenges associated with studying IA are not the only source of controversy within the field as there is an ongoing debate regarding whether problematic Internet use should be considered a disorder at all (Fitzpatrick, 2008; Griffiths, 1999). The persistence of this debate is readily seen in the American Psychiatric Association’s decision to include IA in the DSM-V (released in 2013), but only as an appendix with the goal to encourage additional research (Acier & Kern, 2011; Chakraborty et al., 2010). Scholars in the field have addressed these concerns by noting that IA is a complex problem due to the very nature of the Internet and the fact that social life has become increasingly intertwined with technology (Billieux & Van der Linden, 2012; Young, 2011). As a result, it is a difficult task for scholars to “draw the line” between normal Internet use and problematic Internet use (Young, 2011). To further clarify the *type* of IA impacting users, five subtypes have been identified: (1) computer game addiction, (2) cyber-relational addiction, (3) cybersex addiction, (4) information overload, and (5) pathological online stock trading or

gambling (Young & de Abreu, 2010; Young, Pistner, O’Mara, & Buchanan, 1999). And, although previous studies have produced largely heterogeneous results, some patterns have begun to emerge (Billieux & Van der Linden, 2012).

One such pattern that has emerged is evidence indicating individuals with interpersonal challenges “offline” are at increased risk of engaging in problematic internet use (Acier & Kern, 2011; Caplan & High, 2011; Lam et al., 2009; Weinstein & Lejoyeux, 2010), which in turn only further worsens their relationships with others (Andreou & Svoli, 2013; Christakis, 2010). Additionally, while several studies have identified males are at greater risk of becoming addicted to the Internet (Anderson, 2001; Chakraborty et al., 2010; Ha et al., 2007), a clear consensus has not been reached across studies. For example, Griffiths (1999) notes that females comprised a greater majority of dependent users in Young’s (1998) study, but adds that this may be the result of females being more willing to disclose problematic behaviors (Weinstein & Lejoyeux, 2010 as cited in Griffiths, 1999). Although in other studies, gender was not a statistically significant risk factor (Andreou & Svoli, 2013).

Another pattern that has emerged across studies is the increased risk of problematic internet use among adolescents and young adults (Acier & Kern, 2011; Andreou & Svoli, 2013; Aydin & Sari, 2011; Ha et al., 2007; Hawi, 2012; Kwon, Chung, & Lee, 2011; Lam et al., 2009) and particularly those in college (Anderson, 2001; Christakis, Moreno, Jelenchick, Myaing, & Zhou, 2011). Scholars have speculated that this population is particularly vulnerable, because of their near constant access to the Internet – again, particularly in a college environment (Anderson, 2001; Castiglione, 2008; Christakis et al., 2011; Young, Yue, & Ying, 2011). In addition, adolescents and young adults are also still developing and some may be less socially inclined than others, which could then lead those experiencing difficulty in connecting in the real-world to pursuing those bonds in a virtual environment (Anderson, 2001).

Anderson’s (2001) aforementioned observation was recently supported in a study focusing on the perceptions of problematic internet users among addiction counselors (Acier & Kern, 2011). In their study, Acier and Kern (2011) found that addiction counselors unanimously agreed that role-playing games and virtual relationships (maintained either through instant messaging or dating sites) were two applications most clearly associated with troubling online behavior. Moreover, counselors noted that IA clients were also inhibited, introverted, withdrawn, and experienced trouble expressing themselves (Acier & Kern, 2011). In another study, IA was also negatively correlated with self-esteem (Aydin & Sari, 2011). In other words, youth who had low self-esteem were at increased risk of developing IA (Aydin & Sari, 2011). However, to be clear, evidence of IA has also been found in the adult population and even in the workplace (Griffiths, 2000, 2001, 2010).

According to research conducted by Griffiths (2000, 2001, 2010), although a substantial amount of IA studies focus on youth, the problem exists in the adult population as well. Indeed, one area of adult behavior that IA may be particularly apparent is online sexual behavior (Griffiths, 2000, 2001). Per Griffiths (2001), pornographers have typically been one of the first groups to exploit technological advances to pursue their interests. For example, in one review of IA and the implications for sexual behavior, Griffiths (2000) notes that IA is most likely associated with users’ online pornography use for self-pleasure, online relationships in general, and sexually related crime. These findings were supported in another review of the literature on IA and online sexual behavior. In that review, Griffiths (2001) noted that the Internet does appear to function as a new medium for users to pursue avenues of sexual pleasure, perhaps due to the anonymity one can maintain online. However, he did note that the lack of data on the subject made it difficult to reach any firm conclusion on the scope of the problem (Griffiths, 2001). Taking into account the aforementioned

studies, there is growing evidence suggesting users *can* become addicted to the Internet or, more likely, to the activities made available through cyberspace (Griffiths, 2010) – such as the thrill of pirating digital media.

3. Internet addiction and digital piracy: What is the connection?

The connection between IA and engagement in digital piracy has yet to be explored (to the best of our knowledge) despite the overlap in the characteristics of each. For example, indicators of IA typically include the following: tolerance, withdrawal, preoccupation, craving, and a lack of control to discontinue use despite consequences (Bergmark, Bergmark, & Findahl, 2011; Billieux & Van der Linden, 2012; Young et al., 2011). As such, scholars have referred to IA as a behavioral addiction or an impulse control disorder (Billieux & Van der Linden, 2012). Relatedly, in studies on digital piracy, a relationship between a lack of self-control and engagement in the deviant behavior has also been established (Higgins, 2007; Higgins et al., 2008; Hinduja, 2012; Marcum et al., 2011). Another area of overlap concerns the population most likely to engage in piracy.

Due to the increasing intertwining of social life and technology, youth are particularly vulnerable to developing IA (Anderson, 2001; Castiglione, 2008; Christakis et al., 2011; Ha et al., 2007; Young et al., 2011). Moreover, evidence suggests that males may be at greater risk compared to females (Anderson, 2001; Chakraborty et al., 2010; Ha et al., 2007). Similarly, studies on digital piracy have also found a relationship between age and perpetration (Gunter et al., 2010). Indeed, per Gunter et al. (2010), studies on digital piracy have almost exclusively focused on college students. Moreover, males are typically more likely to engage in piracy compared to females (Gunter et al., 2010; Hinduja, 2012). Finally, users' self-reported feelings from Internet use and engagement in piracy are also comparable.

One of the suspected driving features of IA is the feeling obtained by dependent users when utilizing the Internet despite the very real consequences they may be experiencing offline (Bergmark et al., 2011; Shaw & Black, 2008; Weinstein & Lejoyeux, 2010; Young et al., 2011). Indeed, a powerful indicator of addiction is users' mood modification that occurs after engaging in the activity (Griffiths, 1999). In other words, the "buzzed" feeling that users' experience (Griffiths, 1999). Comparable feelings have also been reported in studies on digital piracy. For example, in a study completed by Al-Rafee and Cronan (2006), users reported being "happy and excited" after stealing digital material (p. 246).

Taking into account the aforementioned areas of overlap, this study sought to explore whether there was evidence to suggest that addiction to the internet was an *underlying* cause of pirating. At the surface, the relationship appears highly possible given that digital piracy is similar to other impulse control disorders such as kleptomania, which is partially identified by an inability to resist the urge to steal objects and the resulting pleasure or gratification after committing the act (American Psychiatric Association., 2000). And, interestingly, this comparison has already been proposed through popular news outlets (ABC News., 2012). However, has yet to be explored through any empirical investigations.

4. Gaps and research questions

The present exploratory study sought to address a gap in the current literature on problematic Internet use by investigating the relationship between IA and digital piracy. Thus, the main research question guiding this study was whether IA was correlated with digital piracy. The expectation was that IA would indeed be correlated with digital piracy and increase odds of perpetration. Secondly, taking into account that previous literature on both IA and digital

piracy emphasizes the importance of online relationships (Acier & Kern, 2011; Fitzpatrick, 2008; Marcum et al., 2011), it was expected that deviant peer association would increase the odds of pirating. Finally, taking into account that previous research on both IA and digital piracy has largely shown that these problems affect a greater proportion of males (Andreou & Svoli, 2013; Gunter et al., 2010; Hinduja, 2012; Lam et al., 2009; Shaw & Black, 2008), it was expected that being male would increase the odds of pirating.

5. Methods

5.1. Research design

A rural county in western North Carolina was chosen to participate in the study. The Board of Education for that county gave approval for its students to participate. After obtaining Internal Review Board approval from the researcher's university, the principals of four high schools in this county agreed to allow their students to participate on a voluntary basis. All 9th through 12th graders were recruited for the study. First, a consent form was sent home two weeks before administration of the survey to the parents and/or legal guardians of all the students, along with information about the study. Only those students with signed permission forms took part in the study. At the time of survey administration, all children able to participate were given the survey with an assent form attached. Respondents were able to withdraw from participation at any time. A total of 1669 high school students were invited to participate and 1617 surveys were completed, a 96.8% response rate.

6. Measures

The measures for this study include items from piracy, low Internet-related problems, deviant peer association, age, sex, race, and GPA.

6.1. Piracy

The dependent measure for this study is piracy. Three items are used for this study. The three items are as follows: Have you ever performed following behaviors in the past year: (1) illegally downloaded software from the Internet, (2) illegally downloaded a movie from the Internet, and (3) copied a music CD. The original answer choices for these items are 1 (Never) and 5 (7+ times). The original answer choices result in non-normal data. To alleviate the non-normal data issue, the answer choices are collapsed to represent 0 (Never) and 1 (performed).

6.2. Internet related problems

To address our hypothesis that individuals who have Internet-related problems are more likely to piracy, we used Armstrong et al.'s (2000) measure. The measure consists of 20-items that capture concepts of tolerance, withdrawal, craving, and negative life consequences. These concepts are consistent with the DSM-IV's criteria for substance use. The items are scored using a 10-point Likert-type scale (1 = Not true at all and 10 = extremely true); thus, higher scores on the scale indicate more Internet related problems. The internal consistency of scale is acceptable (Cronbach's alpha = 0.94).

6.3. Deviant peer association

To address our hypothesis that individuals who associate with deviant peers are more likely to perform piracy, we include an expanded measure to capture multiple forms of crime and deviance. The measure captures the number of friends that perform

an action in the past year. The items for this measure are as follows: How many of your friends performed the following behavior in the past year: (1) texted a nude/partially nude picture, (2) used another person's debit/credit card without his/her permission, (3) used another person's license/ID card without his/her permission, (4) logged into another person's email without his/her permission and sent an email, (5) logged into another person's Facebook and posted a message, (6) accessed a website for which you were not an authorized user, (7) illegally downloaded a song or album from the Internet, (8) illegally downloaded software from the Internet, (9) illegally downloaded a movie from the Internet, (10) copied a music CD, (11) copied a software license, (12) copied a DVD, (13) repeatedly contacted someone online event after they requested he/she stop, (14) threatened another individual with violence online, and (15) repeatedly made sexual advances at someone. The respondents marked their responses using a 5-point Likert-type scale (1 = None and 5 = all of them). Higher scores on the scale indicate more association with deviant peers. The internal consistency for this measure is acceptable (Cronbach's alpha = 0.95).

6.4. Control measures

We use a number of control measures. Age is a control measure and the respondent is asked to provide their age. Race is a dichotomous measure (0 = non-white and 1 = white). Gender is a dichotomous measure (0 = female and 1 = male). GPA is the self-report of the respondents' current grade point average.

7. Analysis plan

The analysis plan takes place in two steps. The first step is a presentation of the descriptive statistics. The descriptive statistics provide some indication of the distribution of the data. The second step is the use of multiple regression. Multiple regression is an analysis technique that uses a set of independent measures (i.e., low Internet-related problems, deviant peer association, age, sex, race, and GPA) to predict or correlate to a dependent measure (i.e., piracy) (Freund & Wilson, 2002). In this study, the dependent measure is dichotomous, and this makes the use of Ordinary Least Squares regression improper. Using OLS in this situation violates the assumption of continuous dependent measures (Lewis-Beck, 1979). In this study, binary logistic regression is the proper technique (Pampl, 2002). While binary logistic regression is the proper technique, as with any form of multiple regression, multicollinearity is a potential problem. To check this issue, we follow Menard's (2002) suggestion that the tolerance coefficient may be proper to use in binary logistic regression. Freund and Wilson (2002) argue that tolerance levels that 0.20 and below indicate multicollinearity problems.

Table 2
Logistic regression analysis of digital piracy.

Measure	Software				Movies				Musi			
	<i>b</i>	SE	Exp(<i>b</i>)	Tol.	<i>b</i>	SE	Exp(<i>b</i>)	Tol.	<i>b</i>	SE	Exp(<i>b</i>)	Tol.
Internet related problems	0.01**	0.00	1.01	0.83	0.00	0.00	1.00	0.83	0.00	0.00	1.00	0.83
Peer association	0.11**	0.01	1.11	0.85	0.13**	0.01	1.13	0.85	0.12**	0.01	1.13	0.85
Age	-0.01	0.08	0.99	0.99	-0.09	0.07	0.92	0.99	0.14*	0.06	1.15	0.99
Male	1.04**	0.22	2.83	0.97	0.39**	0.19	1.48	0.97	-0.14	0.14	0.87	0.97
Race	0.06	0.24	1.06	0.96	-0.12	0.21	0.89	0.96	0.40*	0.17	1.48	0.96
Grade point average	-0.04	0.08	0.96	0.94	0.07	0.07	1.07	0.94	0.01	0.06	1.01	0.94
Chi-square:	221.44**				240.13**				257.03**			
-2log Likelihood:	689.82				819.47				1272.47			
Cox & Snell:	0.16				0.17				0.18			
Nagelkerke:	0.31				0.30				0.26			

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

Table 1
Descriptive statistics.

Measure	Mean	SD	Alpha
Software piracy	0.13	—	—
Music piracy	0.15	—	—
Movie piracy	0.29	—	—
Internet related problems	40.87	27.45	0.94
Peer association	20.80	10.07	0.95
Age	15.77	1.33	—
Sex	0.49	—	—
Race	0.72	—	—
GPA	2.30	1.33	—

8. Results

Table 1 presented the descriptive statistics. The table shows that 13% of the sample has performed software piracy. In addition, 15% of the sample has performed music piracy, and 29% of the sample has performed movie piracy. The average Internet related problems score for the sample was 40.87. The average peer association score for the sample was 20.80. The average age of the sample was 15.77. 49% of the sample was male. 72% of the sample was white. The average grade point average is 2.30.

Table 2 shows the logistic regression results for software, music, and movie piracy. The results for each logistic regression support our assumption that indicates that Internet related problems and social learning theory are able to explain software piracy. As Internet related problems increase software piracy increases ($b = 0.01$, $\text{Exp}(b) = 1.01$). As an individual associates with more deviant peers the likelihood of software piracy increases ($b = 0.11$, $\text{Exp}(b) = 1.11$). Males are more likely to pirate software than females ($b = 1.04$, $\text{Exp}(b) = 2.83$).

Concerning movie piracy, as deviant peer association increases ($b = 0.12$, $\text{Exp}(b) = 1.13$) the likelihood of movie piracy increases, and this is supportive social learning theory. In addition, males are more likely than females ($b = 0.39$, $\text{Exp}(b) = 1.48$). The results for music piracy differ from the previous model. Social learning theory is supported in these data. As deviant peer association increases the likelihood of music piracy increases ($b = 0.12$, $\text{Exp}(b) = 1.13$). In addition, as age increases the likelihood of music piracy increases ($b = 0.14$, $\text{Exp}(b) = 1.15$). Further, whites are more likely than non-whites to pirate music ($b = 0.40$, $\text{Exp}(b) = 1.40$). The tolerance coefficients for each measure do not indicate that multicollinearity is a problem.

9. Discussion

Adolescence is a period of discovery of interests and development of a person's identity. However, it is also a time of uncertainty and instability for youth. Individuals are often easily persuaded to

participate in deviant behaviors to gain acceptance and status. This can result in a multitude of negative repercussions including addictions, poor grades, parental conflict, and involvement with the juvenile justice system to name only a few. The high school students surveyed in this study reported on a plethora of legitimate and deviant online behaviors of themselves, as well as their friends. One of the important findings of this study is that Internet addiction (IA) is in fact related to a form of deviant online behavior: digital piracy.

Based on the results of the study, we can determine that high school students who have Internet-related problems due to addiction are more likely to commit a specific form of piracy involving the illegal downloading of software. Not surprisingly, youth who committed this form of piracy were also more likely to have deviant peers. In other words, their behaviors were influenced by friends who committed similar or other deviant acts. Results also indicated that males were more likely to commit software piracy, supporting previous studies that males are more likely to participate in piracy compared to females (Gunter et al., 2010; Hinduja, 2012). Furthermore, as males are at greater risk of IA (Anderson, 2001; Chakraborty et al., 2010; Ha et al., 2007), this continues to compliment our findings.

The remaining two forms of piracy for juveniles are not predicted by IA based on our findings. However, the results did support past findings that deviant peer association and piracy behaviors are significant related (Bossler & Burruss, 2011; Higgins et al., 2007, 2008; Hinduja & Ingram, 2009; Holt et al., 2010; Ingram & Hinduja, 2008; Morris & Higgins, 2010). Individuals who associated with deviant peers are more likely to commit piracy, along with other forms of cybercriminality.

There are limitations to this study that should be noted. First, the sample of juveniles is from a rural county in the southeast. The issue of external validity could be a factor when considering the piracy behaviors of juveniles in more urban regions in different areas of the country. Future research indicates the need to perform geographical comparison studies of juveniles with this type of behavior. Secondly, there is always a question of the accuracy of the data provided, as juveniles were the respondent population. However, a notable portion of the sample did report participation in this behavior and it is fair to assume that even more of the juveniles in the study also have committed piracy but refrained from admitting participation.

Despite its limitations, this literature is extremely important as it investigates a topic that currently it lacking exploration: the relationship between IA and online criminal behaviors. Youth are especially susceptible to IA (Anderson, 2001; Castiglione, 2008; Christakis et al., 2011; Ha et al., 2007; Young et al., 2011), therefore indicating the need for preventative programming in our public and private schools. Focusing efforts on redirecting energy from reliance on technology and Internet use to other forms of extracurricular and educational programs would be beneficial, as well as educational programs for parents on the repercussions of unmonitored Internet use. Further, recognition of the juvenile groups who have a strong interest in technology and innovation may be the minors to target for this type of intervention.

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