



Cyber Deviance among Adolescents and the Role of Family, School, and Neighborhood: A Cross-National Study

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Abstract

The ever ubiquitous spread of information and communication technology (ICT) has enabled an increasing number of youth access to the Internet leading to a rise of illegal downloading and hacking problems (Cyber Deviance). To date most criminological studies on illegal downloading or hacking have focused on college samples and have been confined to a single city or country. This study, using data from the second International Self-Report Delinquency Study (ISR2), examined illegal downloading and hacking perpetration among adolescents from 30 countries around the world. Participants were 68,507 students attending high schools (7th, 8th, and 9th grade). Using gender, grade (proxy for age), and access to a computer at home as covariates the study examined parental control, attachment to family (relationships, family leisure and eating dinner together), self-control, attitudes towards violence, attachment and disorganization to school, and attachment, integration and disorganization of the neighborhood as possible predictors of illegal downloading and hacking. Regression analysis revealed that all of the independent variables with the exception of family leisure were significantly associated with either illegal downloading or hacking to a differing degree. The findings and their implications for future studies are discussed.

Keywords: Cyber Deviance, Illegal Downloading, Hacking, Internet, Adolescents, Cross national.

Introduction

With the advent of new technologies and the ubiquity of the Internet, the world is now more connected than ever. Internet access around the world is increasing rapidly and, at the moment, Internet access for household stands at an average of 71.6% for OECD countries (Organisation for Economic Co-operation and Development, 2012). The Internet has proven to be extremely helpful, but it doesn't come without a cost. Cyber crime, software piracy, illegal downloading, hacking, and cyber bullying among others have all become part of our daily lives. Both illegal downloading and hacking, each for its own reason, have attracted a lot of attention from researchers and media alike. While the main issue with illegal downloading is copyrights and the vast amounts of money that

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music and movie producers don't receive due to sharing (Navarro, Marcum, Higgins, & Ricketts, 2014), hacking poses a security risk and can be potentially devastating to individuals, companies or countries alike. Theft of personal and financial data through hacking can be used against individuals and at the same time critically damage the reputation of a company (Nelson, 2014). Younger generations have been shown to adopt new technologies faster, leading to the debate of digital natives and digital immigrants (Prensky, 2012), which makes adolescents the perfect sample to study the link between technology and behavior.

Digital Piracy and Illegal Downloading

Illegal downloading of software, movies and especially music has become an increasingly contentious issue. Setting aside the moral and legal debate of what pertains lawful and unlawful downloading (for a good discussion see Cluley, 2013), a number of studies have tried explain downloading and online piracy. The two most widely used theoretical frameworks are social learning theory and self-control theory. In support of the social learning perspective Hinduja and Ingram (2009) found that real-life association with deviant peers was the biggest predictor of music piracy, although online peers and online media were also significant factors. Morris and Higgins (2010) employed vignettes and asked their respondents "How likely would it be for you to [go on-line and find a copy of the movie and download it for free, download the CD illegitimately under these circumstances, to have friends ask you to make a copy it]" to measure the possibility of digital piracy. The results indicated at modest support for Aker's social learning theory (Morris & Higgins, 2010). Lastly, lending credence to the social learning approach, Navarro et al. (2014) found that associating with deviant peers increased an individual's likelihood of committing software, movie or music piracy.

Research concerning digital piracy and self-control is sparse and oftentimes done in conjunction with the social learning theory. Higgins, Wolfe, and Marcum (2008) employed the full scale of self-control, which was developed by Grasmick, Tittle, Bursik, and Arneklev (1993). Their dependent variable was "I would go to the web-site with the intention to download the CD under these circumstances", which does not specify if the CD is music, movies, or software (Higgins et al., 2008). In this way the authors encompass all the possible types of digital piracy, but at the same time it is impossible to differentiate between them. In light of the limitations of the study, the authors found that low self-control and especially the impulsivity subscale are significantly associated with the intention of digital piracy (Higgins et al., 2008). This is in line with Higgins and Wilson (2006) who examined the link between self-control, differential association and software piracy. Their findings supported low self-control and differential association, however the statistical significance was lost in the sub-sample group with high morals (Higgins & Wilson, 2006). Thus one's morals can possibly negate the influence of low self-control or differential association. A more nuanced approach to digital piracy includes both self-control and social learning theory. First, Higgins and Makin (2004b) and Higgins (2005) reported that self-control correlated with software piracy more strongly for those respondents that had associated with more deviant peers already. Second, Higgins and Makin (2004a) expanded on this finding and included attitudes towards software piracy and moral beliefs in their regression analyses. Their conclusions, based on regression analyses, corroborated previous findings on the conditioning effects of social learning

theory. This means that self-control becomes less significant for predicting software piracy once one's daily associates are taken into account. Furthermore, the gender gap (the offenders being overwhelmingly male), that has been consistently found by studies examining such behaviors as hacking or downloading (e.g., Turgeman-Goldschmidt, 2008; Young, Zhang, & Prybutok, 2007), was partially explained by association with deviant peers (Higgins, 2006).

Higgins, Fell, and Wilson (2006) took a step further and used structural equation modeling to test how self-control and social learning theories interact in one model. They concluded that a three factor model (low self-control→social learning theory→digital piracy) is superior to alternative models (e.g., both theories having direct effects), showing that social learning theory is a necessary component for a fuller explanation of digital piracy. A more recent study examining self-control, social learning theory and their links to software piracy revealed that self-control plays a more important role indirectly through social learning, and, when controlling for social learning increased levels of low self-control, likelihood of software piracy went down (Burruss, Bossler, & Holt, 2012). The debate around Gottfredson and Hirschi's self-control theory and Aker's social learning theory exhibits contradictory results and it is fair to say that both theories offer valid approaches to predicting digital piracy.

Finally, a number of studies have looked at software piracy from a slightly different theoretical point of view. While still measuring the influence of self-control, Higgins (2007) examined rational choice as a possible factor that could explain software piracy. Low self-control proved to be a direct and indirect influence on software piracy, and situational factors derived from the rational choice theory mediated this effect (Higgins, 2007). Hinduja (2007) explored techniques of neutralization, which is a theoretical framework originally from delinquency research (Sykes & Matza, 1957). Adapting it to 51 items comprised of "Denial of Responsibility," "Denial of Injury," "Denial of Victim," "Condemnation of the Condemners," "Appeal to Higher Loyalties," "Metaphor of the Ledger," "Claim of Normalcy," "Denial of Negative Intent," and "Claim of Relative Acceptability," the study found only weak support for the theory, noting that respondents did not consider software piracy to be something culpable, which could partially explain the poor results (Hinduja, 2007). Exploring the deindividuation theory, Hinduja (2008) specifically studied anonymity and pseudonymity, but found no significant difference in software piracy levels between respondents scoring higher or lower on either of the scales.

Hacking

Originally the word "hacker" had a positive connotation and was attributed to individuals with exceptional skill for being able to find shortcuts or "hacks". Nowadays it has been turned upside down (Seigfried-Spellar & Treadway, 2014). Drawing from the labeling perspective proposed by Becker (1963), Yar (2005) argues that it is the governments, law enforcement and media who construct hacking as a criminal activity, and therefore adding the negative connotation to it. To date very few studies have looked specifically at hacking. The most frequently used theory to analyze hacking has been social learning theory (Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979). One of the first studies to explore the link between social learning and hacking was by Skinner and Fream (1997), who found modest support for the theory. Measurement of hacking included several items such as "tried to guess another's password to get into his or her computer account or files," "accessed another's computer account or files without his or her

knowledge,” and “wrote or used a program that would destroy someone’s computerized data (e.g., a virus, logic bomb, or trojan horse).” Differential association and differential reinforcement/punishment were both significant predictors of the aforementioned hacking behaviors (Skinner & Fream, 1997). Holt, Burruss, and Bossler (2010) studied the full social learning model using structural equation modeling (SEM) analysis and found that, not only is social learning directly linked to cyber deviance, it also explains the gender gap. Taking into account the cross-sectional nature of the study, the SEM model explained 81% of the variance in cyber deviance, which is more than the average usually reported in the field (Holt et al., 2010). Finally, Holt, Bossler, and May (2012) did a similar study using the same measures Skinner and Fream (1997) had used with a sample of middle and high school students. Their findings confirm that deviant peer associations, as well as lower self-control, were significant predictors of hacking and sharing “pirated” software (Holt et al., 2012).

Besides the social learning theory the next most frequently used theoretical approach is the self-control theory, also known as the general theory of crime. (Gottfredson & Hirschi, 1990). It is most widely used in criminology. Bossler and Burruss (2011) used the classic self-control theory developed by Gottfredson and Hirschi to analyze hacking. While some scholars argue that being a hacker means having self-control, discipline and the commitment to learn systematically (Holt & Kilger, 2008; Jordan & Taylor, 1998), Bossler and Burruss (2011) refer to Gottfredson and Hirschi, contending that most hacking is simple and thus self-control plays an important role. Previous studies have shown that there is no connection between self-control and hacking intentions (Gordon & Ma, 2003), however, a growing body of evidence suggests that self-control is in fact related to hacking in a significant way (Bossler & Burruss, 2011; Donner, Marcum, Jennings, Higgins, & Banfield, 2014; Holt et al., 2012).

Apart from the two aforementioned theories, researchers have linked parent-child relationships and depression (Kong & Lim, 2012), willingness to hack (Beebe & Guynes, 2006), and risk propensity and rationality (Bachmann, 2010) to hacking behavior. In addition, introversion has been associated with hacking and related computer crime activities (Rogers, Seigfried, & Tidke, 2006), however others found no such connection (Seigfried-Spellar & Treadway, 2014). Seigfried-Spellar and Treadway (2014) suggest that the stereotypical argument about the Net Generation or the digital native hackers being introverted tech geeks has become moot, as everyone growing up now is much closer to technology by default. A qualitative study of 54 self-professed hackers in Israel revealed that hacking for them is a form of entertainment, with the purpose of seeking fun, gaining knowledge, and showing off their skills (Turgeman-Goldschmidt, 2005). Moreover, hackers often see themselves as positive deviants and lack shame no matter how serious their offenses are (Turgeman-Goldschmidt, 2008). They also deny their guilt by blaming the victim (Young et al., 2007). Self-proclaimed hackers oftentimes think that the chances of punishment for hacking are smaller than for shoplifting, although the general student population believes in the opposite (Zhang, Young, & Prybutok, 2008). This could explain their easy-going attitude towards hacking and its possible consequences.

Purpose of the Study

No existing study has looked into the role of family, school and neighborhood at the same time in connection with cyber deviance. The exceptions that include at least one of the aforementioned factors are Aoyama, Barnard-Brak, and Talbert (2011), who examined parental monitoring and found no significant association with cyber bullying, and Kong and Lim (2012) who found that parent–child relationship plays a significant role in cyber delinquency (a scale comprising items that include downloading, hacking, swearing and lying online).

Furthermore, the utilization of the ISRD-2 data will give an unparalleled opportunity to examine cyber deviance across various regions and countries around the world. Previous studies that have examined downloading and hacking have mostly employed small college student samples in one country. There is a dearth of knowledge when it comes to cross-national comparisons and more representative samples. The purpose of this study is to fill this knowledge gap. Do adolescents differ in their engagement in cyber deviance around the world? Are traditional criminological theories applicable to cyber deviance in comparison to predicting delinquency and offline deviant behavior?

Methods

Participants

The 2005–2007 ISRD-2 study participants were 68,507 students from 30 countries: 34,583 females (50.5%), 33,758 males (49.3%), and 166 not specified (0.2%). The distribution between grades was 22,631 in Grade 7 (33.0%), 22,715 in Grade 8 (33.2%) and 23,161 in Grade 9 (33.8%). For a detailed discussion about the ISRD-2 study, the sample and methodology used consult Marshall and Enzmann (2012). Originally there were 31 participant countries, but Canada was excluded from the final sample due to internal data protection policies (Marshall & Enzmann, 2012). Countries were subdivided into clusters depending on geographical and cultural factors (see Esping-Andersen (1990) and Saint-Arnaud and Bernard (2003)). The Anglo-Saxon cluster includes the USA and Ireland. The Northern Europe cluster is represented by Iceland, Finland, Sweden, Norway, and Denmark. The Western Europe cluster refers to Netherlands, Austria, Germany, Switzerland, France, and Belgium. The Mediterranean cluster is represented by Portugal, Cyprus, Italy, and Spain. The Latin-American cluster is represented by Suriname, and Venezuela. Lastly, the Post-Socialist cluster consists of Estonia, Lithuania, Poland, Czech Republic, Hungary, Slovenia, Bosnia and Herzegovina, Russia, and Armenia (Marshall & Enzmann, 2012).

Measures

1) Independent variables

The ISRD-2 study included a variety of scales and measures taken from fields such as criminology, sociology, and psychology. Variables concerning family (described originally by Hirschi (1969) as “attachment” in social bonds theory) inquired about relationships with parents (or guardians), the quality of leisure time spent together, as well as the number of times dinner is consumed together. Items asking about family included relationships with the man or woman (e.g., “How do you usually get along with the man you live with (father, stepfather....)?”) The coded responses were 1= “I don’t get along at all,” 2= “I don’t get along so well,” 3= “I get along rather well,” and 4= “I get along just fine.” Family leisure was measured by one item: “How often do you and your parents (or

the adults you live with) do something together, such as going to the movies, going for a walk or hike, visiting relatives, attending a sporting event, and things like that?” which was 1= “Almost never,” 2= “About once a year,” 3= “A few times a year,” 4= “About once a month,” 5= “About once a week,” and 6= “More than once a week.” Next, an item eating dinner together (“How many days a week do you usually eat the evening meal with (one of) your parents (or the adults you live with)?”) was coded as follows: 1= “Never,” 2= “Once,” 3= “Twice,” 4= “Three times,” 5= “Four times,” 6= “Five times,” 7= “Six times,” 8= “Daily.” The last variable concerning family inquired about parents knowing the respondents’ friends (“Do your parents (or the adults you live with) usually know who you are with when you go out?”). The responses were coded as follows: 1= “Rarely/never,” 2= “Sometimes,” 3= “Always.”

Other measures include the 5 item attitudes towards violence scale (Wilmers et al., 2002) comprised of the following items: “A bit of violence is part of the fun.” “One needs to make use of force to be respected.” “If somebody attacks me, I will hit him/her back.” “Without violence everything would be much more boring.” “It is completely normal that boys want to prove themselves in physical fights with others.” Scale description: scores 5–20; Cronbach’s $\alpha=.70$; $M=5.05$; $SD=3.34$.

Next, a shortened 12 item self-control scale was employed (Grasmick et al., 1993). The self-control scale was comprised of four subscales: impulsivity (3 items: “I act on the spur of the moment without stopping to think.” “I do whatever brings me pleasure here and now, even at the cost of some distant goal.” “I’m more concerned with what happens to me in the short run than in the long run”); risk-taking (3 items: “I like to test myself every now and then by doing something a little risky.” “Sometimes I will take a risk just for the fun of it.” “Excitement and adventure are more important to me than security”); self-centeredness (3 items: “I try to look out for myself first, even if it means making things difficult for other people.” “If things I do upset people, it’s their problem not mine.” “I will try to get the things I want even when I know it’s causing problems for other people”); and volatile temperament (3 items: “I lose my temper pretty easily.” “When I’m really angry, other people better stay away from me.” “When I have a serious disagreement with someone, it’s usually hard for me to talk calmly about it without getting upset.”) Scale description: scores 12–48; Cronbach’s $\alpha=.83$; $M=26.00$; $SD=7.29$.

The 8 item school scale was comprised of two subscales: school attachment (4 items: “If I had to move I would miss my school.” “Teachers do notice when I am doing well and let me know.” “I like my school.” “There are other activities in school besides lessons (sports, music, theatre, disco’s)”) and school disorganization (4 items: “There is a lot of stealing in my school.” “There is a lot of fighting in my school.” “Many things are broken or vandalized in my school.” “There is a lot of drug use in my school.”) Scale descriptions as follows: school attachment: scores 4–16; Cronbach’s $\alpha=.61$; $M=12.28$; $SD=2.69$ and school disorganization: scores 4–16; Cronbach’s $\alpha=.75$; $M=8.56$; $SD=3.02$.

The 10 item neighborhood scale (adapted from Sampson, Raudenbush, and Earls (1997) and Sampson, Morenoff, and Earls (1999)) consisted of three subscales: neighborhood attachment (2 items: “If I had to move, I would miss the neighborhood” and “I like my neighborhood”); neighborhood disorganization (5 items: “There is a lot of crime in my neighborhood.” “There is a lot of drug selling.” “There is a lot of fighting.” “There are a lot of empty and abandoned buildings.” “There is a lot of graffiti”); and neighborhood integration (3 items: “This is a close-knit neighborhood.” “People in this

neighborhood can be trusted.” “People in this neighborhood generally don’t get along with each other.”) Three items from the full neighborhood scale were not included in the analysis based on previous findings from this dataset (Marshall & Enzmann, 2012, p. 55). Scale descriptions as follows: neighborhood attachment: scores 2–8; Cronbach’s $\alpha=.76$; $M=6.48$; $SD=1.77$; neighborhood disorganization: scores 5–20; Cronbach’s $\alpha=.82$; $M=8.21$; $SD=3.59$; and neighborhood integration: scores 3–12; Cronbach’s $\alpha=.82$; $M=8.55$; $SD=2.55$.

The responses for all scales ranged from “Fully disagree,” “Somewhat disagree” to “Somewhat agree” and “Fully agree” (coded as 1 – Fully disagree to 4 – Fully agree that were then summed up for scale values).

2) *Dependent variables*

The ISRD-2 study asked about hacking and downloading generally, and followed up with a second dichotomous response inquiring about the last 12 months. This study looked at only those who responded affirmatively to the second question (coded as 1=experience), while the rest were coded as 0=no experience. The corresponding questions for the items were “When you use a computer did you ever download music or films?” and “Did you ever use your computer for ‘hacking?’”

3) *Control variables*

While the survey included separate measures for age and grade, this study will use the student’s grade as a proxy for age. Analysis by Marshall and Enzmann (2012, pp. 45–46) shows that using grade is acceptable in a study design where classes are the primary sampling units, not individual students. Grade was coded as 1=grade seven, 2=grade eight and 3=grade nine. Gender was coded as 1=female and 2=male. The last covariate item was computer availability at home which was coded as 1=no computer at home to use and 2=computer at home to use.

Procedure

The dataset for this study was acquired from Inter-university Consortium for Political and Social Research data archive.

Data analyses

Logistic regression was chosen as the method most fit to analyze the dichotomous dependent variables measuring downloading and hacking experience (Menard, 2002). All the items in the model were tested for multicollinearity and were deemed appropriate for analysis. Gender, grade and the availability of a computer at home were added as covariates in the models. All analyses were conducted in R (ver. 3.2.1). Regressions were conducted using the “glm” function in R. The significance level was set at $p<0.05$.

Results

1. Frequencies

The overall illegal downloads rate across all countries stood at 47.47%, while hacking perpetration was 5.38 percent. A crosstab analysis of having a computer to use and illegal downloads showed that the relationship between the variables is significant ($p<.001$), but not very strong (Phi-Coefficient=.254; see Table 1). This result suggests that not having access to a personal computer at home greatly reduced the risk of illegal downloading.

However, the results for those who had access to a personal computer at home were less pronounced, and the difference in cyber deviance was much smaller with offenders being slightly numerous. An examination computer availability and hacking showed that the relationship is significant ($p<.001$), but very weak (Phi-Coefficient=.061). However, it is apparent from this analysis that very few respondents who had no computer at home engaged in hacking. As it is a skill that takes certain knowledge and practice, it would be very difficult acquire the necessary traits without having spent a long time in front of the computer screen. Furthermore, schools are likely to restrict the use of their computers in order to prevent exactly such incidents so the students, who would be interested in engaging or learning about hacking, face numerous obstacles.

Table 1. Crosstab analysis of computer access, illegal downloads, and hacking

Illegal downloads	Access to a PC at home	
	No	Yes
No	8,512 (12.89%)	26,156 (39.62%)
Yes	1,891 (2.86%)	29,464 (44.63%)
Hacking		
No	10,236 (15.40%)	52,680 (79.23%)
Yes	231 (.35%)	3339 (5.02%)
Illegal downloads: N=66,023, chi-square=4,255; Hacking: N=66,486, chi-square=244.53		

A comparison of all the delinquency items showed that the vast majority of those who engage in offline deviant behavior have also engaged in cyber deviance. Analysis comparing country groups showed that different regions of the world exhibit varying degrees of perpetration rates for downloading – Anglo-Saxon 49.95%, Northern EU 59.85%, Western EU 52.33%, Mediterranean EU 37.94%, Latin America 31.56%, Post Socialist 49.44%. The differences were even more pronounced for hacking: Anglo-Saxon 3.29%, Northern EU 3.91%, Western EU 5.25%, Mediterranean EU 8.69%, Latin America 3.97%, Post Socialist 4.95%. The group differences for both downloading and hacking were significant ($p<.001$).

2. Psychological and social factors as predictors of downloading and hacking

To examine the influence of individual and social factors predicting downloading and hacking behavior multiple regressions analyses were used. Models one through four were created using binomial logistic regression and focused on downloading. Gender, grade and computer availability at home were used as control variables. Model 1 (see Table 2) represents the individual level measuring attitudes towards violence and self-control. All the variables in Model 1 were significant predictors of downloading. Having a computer at home was associated with more than five times (OR=5.05–5.67) more frequent downloading in the past year. Likewise, boys (OR=1.37–1.47) and students in higher grades or classes (OR=1.39–1.45) were more likely to download music and movies. The influence of attitudes towards violent behavior (OR=1.02–1.04) and self-control (OR=1.04–1.05) was small, but, nevertheless, significant.

Table 2. Multiple logistic regression analysis predicting illegal downloading

	Model 1		Model 2		Model 3		Model 4	
	B (S.E.)	Odd s ratio (CI)	B (S.E.)	Odd s ratio (CI)	B (S.E.)	Odd s ratio (CI)	B (S.E.)	Odd s ratio (CI)
Gender	.35 (.018)	1.42* **	.37 (.020)	1.44* **	.36 (.021)	1.43* **	.38 (.021)	1.46* **
Grade	.35 (.011)	1.42* **	.32 (.012)	1.38* **	.32 (.012)	1.37* **	.32 (.013)	1.38* **
Computer at home	1.68 (.029)	5.35* **	1.69 (.033)	5.40* **	1.68 (.034)	5.37* **	1.70 (.036)	5.49* **
Attitudes towards violence	.03 (.003)	1.03* **	.02 (.004)	1.02* **	.02 (.004)	1.02* **	.02 (.004)	1.02* **
Self-control	.04 (.002)	1.04* **	.03 (.002)	1.03* **	.03 (.002)	1.03* **	.03 (.002)	1.03* **
Get along with father			-.06 (.017)	.94** *	-.05 (.018)	.95**	-.05 (.019)	.95**
Get along with mother			-.05 (.020)	.95* *	-.05 (.020)	.94* *	-.05 (.021)	.95* *
Family leisure			.00 (.008)	1.00	.01 (.008)	1.01	.01 (.008)	1.01
Eat dinner together			-.04 (.005)	.96** *	-.04 (.005)	.96** *	-.03 (.005)	.97** *
Parents know friends			-.34 (.018)	.71** *	-.31 (.018)	.73** *	-.31 (.019)	.73** *
School attachment					-.03 (.004)	.97** *	-.03 (.004)	.97** *
School disorganization					.01 (.004)	1.01* *	.01 (.004)	1.01* *
Neighborhood attachment							.04 (.007)	1.04* **
Neighborhood disorganization							-.00 (.003)	1.00
Neighborhood integration							-.03 (.005)	.97** *
AIC	72843		62448		58124		54881	
Adjusted McFadden R ²	.091		.096		.099		.100	
N	57833		49865		46534		43998	

*p<.05; **p<.01; ***p<.001. All of the regression coefficients are standardized.

Model 2 examined all the previous variables while adding family level items in the regression. Not getting along with either parent (father: OR=.91-.97; mother: OR=.92-.99) and less frequent dining together with parents (OR=.95-.97) were negatively and significantly associated with downloading. By far the most significant predictor among the

family variables was parents knowing whom the adolescent is with when going out, which was negatively and significantly associated with downloading (OR=.70-.74).

Table 3. Multiple logistic regression analysis predicting hacking

	Model 5		Model 6		Model 7		Model 8	
	B (S.E.)	Odd s ratio (CI)	B (S.E.)	Odd s ratio (CI)	B (S.E.)	Odd s ratio (CI)	B (S.E.)	Odd ratio (CI)
Gender	1.08 (.044)	2.95* **	1.14 (.048)	3.16* **	1.12 (.049)	3.07* **	1.13 (.051)	3.10* **
Grade	.23 (.023)	1.26* **	.21 (.025)	1.23* **	.20 (.026)	1.22* **	.19 (.027)	1.21* **
Computer at home	1.12 (.080)	3.08* **	1.20 (.090)	3.32* **	1.15 (.091)	3.16* **	1.21 (.096)	3.34* **
Attitudes towards violence	.05 (.007)	1.05* **	.05 (.007)	1.05* **	.04 (.007)	1.04* **	.04 (.008)	1.04* **
Self-control	.05 (.003)	1.06* **	.05 (.003)	1.05* **	.04 (.004)	1.04* **	.04 (.003)	1.04* **
Get along with father			-.13 (.032)	.88** *	-.11 (.033)	.89** *	-.10 (.034)	.90**
Get along with mother			-.28 (.034)	.76** *	-.26 (.036)	.77** *	-.26 (.037)	.77** *
Family leisure			-.00 (.015)	1.00	.01 (.016)	1.01	.01 (.016)	1.01
Eat dinner together			.03 (.009)	1.03* *	.03 (.010)	1.03* **	.04 (.010)	1.04* **
Parents know friends			-.31 (.033)	.73** *	-.27 (.034)	.76** *	-.26 (.035)	.77** *
School attachment					-.04 (.008)	.96** *	-.04 (.008)	.96** *
School disorganization					.05 (.007)	1.05* **	.04 (.008)	1.04* **
Neighborhood attachment							-.01 (.013)	.99
Neighborhood disorganization							.03 (.006)	1.04* **
Neighborhood integration							.00 (.010)	1.00
AIC	22221		19290		18035		17064	
Adjusted McFadden R ²	.092		.105		.108		.110	
N	58186		50173		46804		44247	

*p<.05; **p<.01; ***p<.001. All of the regression coefficients are standardized.

Model 3 introduced school level variables, which in this case were school attachment and disorganization. All the variables from previous models retained their significance, except for family leisure. Both school variables were significantly associated with downloading, but the odds ratios were very small (school attachment: OR=.96–.98; school disorganization: OR=1.01–1.02). Model 4 introduced the last batch of variables, adding neighborhood to the equation. Again, all the variables from previous models, except family leisure, retained their significance. Neighborhood attachment was positively and significantly (OR=1.03–1.05), while neighborhood integration was negatively and significantly associated with downloading (OR=.96–.98).

Hacking perpetration rates were much lower than downloading rates. Models five through eight focused on predicting hacking (see Table 3). Model 5 employed the same independent variables as Model 1, in this case, predicting hacking. All the variables were positively and significantly associated with hacking. As with downloading, having a computer at home was the strongest predictor with hacking (OR=2.63–3.59). Similarly, as with downloading, boys (OR=2.70–3.21) and students in higher grades (OR=1.20–1.32) were more likely to engage in hacking. Scales measuring attitudes towards violence (OR=1.04–1.07) and self-control (OR=1.05–1.06) showed only a slight, albeit significant, effect on hacking.

Model 6 introduced family variables and, again, family leisure was the only non-significant variable in the model. As with downloading, again not getting along with father (OR=.83–.94) or mother (OR=.71–.81) were indicators for increased hacking behavior. Model 7 showed that the influence of school is rather small but significant: school attachment (OR=.94–.97) was negatively and significantly associated with hacking and school disorganization (OR=1.04–1.07) was positively and significantly associated with hacking. Model 8 included the neighborhood scales. Contrary to Model 4, this time neighborhood disorganization was the only significant predictor of hacking (OR=1.02–1.05), while neighborhood attachment and integration were non-significant.

Separate analyses with the offline delinquency items (ISRD-2 also measured involvement in vandalism, shoplifting, burglary, three types of stealing, snatching a purse, carrying weapons, extortion, group fighting and selling drugs) showed that the same models explained more variance in the dependent variable, i.e., family, school, and neighborhood variables were better at predicting the aforementioned offline delinquency than cyber deviance (illegal downloading and hacking). Regression models, with the same independent variables as in Model 8, were used in this case. The adjusted McFadden R^2 scores were: vandalism =.19; shoplifting =.13; burglary =.19; stealing (bicycle and/or scooter) =.19; stealing (motorbike and/or car) =.25; stealing (from a car) =.20; snatch purse/bag etc. =.17; carry weapon =.19; extortion =.22; group fighting =.18; assault =.20; sell drugs =.21. Males were more likely to be involved in all of the above mentioned delinquent acts except for shoplifting, where gender was not a significant predictor in the model.

Finally, dummy variables were created for countries and used as the only independent variables in the same model to determine how much variance is explained between and within countries. In the case of downloading, 8% (adjusted McFadden R^2 =.08) of the variance is between the countries, while 92% of the variance is within the countries. For hacking these numbers are 3% (adjusted McFadden R^2 =.03) and 97 percent. This shows that country origin is unimportant and most variance in cyber deviance is explained by the factors within the countries themselves.

Discussion and Conclusion

As the spread of technology and the Internet increases, we can expect more and more issues to arise concerning cyber deviance. This study showed that family, school and neighborhood play differing but significant roles in cyber deviance. One of the key findings in this study is that cyber deviance does not significantly vary across the 30 participant countries. Country origin explained only 8% of variance in downloading and 3% in hacking. While computer access rates across the countries might vary greatly, just being a citizen of a certain country does not automatically raise one's chances of engaging in cyber deviance. Furthermore, this is clear evidence, which lends support to the use of combined cross-national samples for the purpose of studying cyber deviance. Thus, the theories that are discussed here should apply to all the participant countries separately, and regardless of the culture.

Yar (2005) argued that the hacking culture itself encourages males to join and purposefully excludes females. Like Yar, this study found that hacking is overwhelmingly male – 8.29% versus 2.58% of females. In comparison, when it comes to downloading, the gender distribution is more even – 54.60% of males versus 42.24% of females. These results are consistent with previous studies that show a much larger gender gap for hacking (Turgeman-Goldschmidt, 2008) than for downloading (Gunter, Higgins, & Gealt, 2010).

The biggest predictor for both downloading and hacking was computer availability at home, which suggests that affordability plays an important role. Because schools might monitor more closely what is happening on their computers, and possibly employ filters, it puts more constraints on how they can be used. This in turn makes it harder to even try downloading illegal software. Furthermore, being caught in any of these acts could spell expulsion from school, or at least a disciplinary case.

Next, gender and grade were significant predictors of both downloading and hacking. For downloading, males were up to 1.46 times more likely to be perpetrators; however, for hacking, the difference was much more pronounced: up to 2.85 times more likely than females. Having a positive attitude towards violent behavior was a significant predictor of both downloading and hacking. Positive attitudes towards violent behavior have already been linked to physical and verbal violence (Avci & GÜÇRAY, 2013; Huesmann & Guerra, 1997; McConville & Cornell, 2003), or other types of high-risk behavior, such as fighting, substance use, and carrying weapons, where males were found to be the more frequent perpetrators (Cornell & Loper, 1998).

Although the odds ratio for self-control as a predictor for downloading and hacking was small, nonetheless it was significant in all the regression models, adding to the already large body of evidence that links low self-control and cyber deviance (Bossler & Burruss, 2011; Gunter et al., 2010; Higgins, 2007; Higgins et al., 2006; Higgins & Makin, 2004b; Holt et al., 2012).

Parental attachment in this study was measured separately for father and mother to see if there are any differences and gain deeper insight in parental relationships in connection with deviant behavior. Even though both items were significant predictors for downloading and hacking, the odds ratios were not the same. Having a bad relationship with mother or father had almost identical negative associations with downloading. In contrast, the odds ratio for getting along with mother was twice the size of getting along with father in the regression models predicting hacking. In this case the relationship with mother seems to play a more important role. This contradicts previous studies that have

shown the father-child relationship being more important (Day & Padilla-Walker, 2009; Williams & Kelly, 2005) or equal in measure (Hirschi, 1969, p. 102) to the mother-child relationship in relation to delinquent or externalizing problem behavior.

Family leisure was not a significant predictor of either downloading or hacking, but eating dinner together was. Eating dinner together was negatively associated with downloading. In contrast, the opposite was true for hacking. Griffin, Botvin, Scheier, Diaz, and Miller (2000) have shown that for adolescents from single-parent families and in female respondents eating family dinners together was negatively associated with delinquency. Other studies have linked regular family meals to decreased aggressive and/or violent behavior (Fulkerson et al., 2006), tobacco smoking (Wada & Fukui, 1994), and for marijuana use in girls (Eisenberg, Olson, Neumark-Sztainer, Story, & Bearinger, 2004; Sen, 2010). Moreover, regular dinners with family also lower the possibility for sex before the age of 16 in boys (Ikramullah & Cui, 2009). A more recent longitudinal study by Musick and Meier (2012) reported similar results, but reduced odds of delinquent behavior via more frequent family dinners were only found at Time 1, and, that significant result disappeared when the researchers tried to model delinquent behavior from Time 1 to Time 2 in their study.

Parental control, or in this case parents knowing the respondents' friends, was a significant predictor of both downloading and hacking. This study supports the view that parental monitoring and control is an important deterrent to deviant behavior (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Herrenkohl et al., 2000; Knoester & Haynie, 2005; Osgood & Anderson, 2004; Osgood, Wilson, O'Malley, Bachman, & Johnston, 1996). Furthermore, effective parenting has been shown to foster higher levels of self-control (Crosswhite & Kerpelman, 2012), which, in turn, could theoretically reduce the chance of downloading and hacking due to low self-control.

School attachment or bonding was significantly and negatively associated with both downloading and hacking. A number of studies have shown that increased attachment to school promotes conforming behavior (Cernkovich & Giordano, 1992; Herrenkohl et al., 2000), while lower school attachment has been linked to bullying (Spriggs, Iannotti, Nansel, & Haynie, 2007), later initiation to deviant behaviors, such as drinking and smoking (Dornbusch, Erickson, Laird, & Wong, 2001), deviance and delinquency (Vazsonyi & Pickering, 2003; Wiatrowski, Griswold, & Roberts, 1981), and cyber-victimization (Schneider, O'Donnell, Stueve, & Coulter, 2012).

School disorganization was positively associated with downloading and hacking. This link might seem less obvious, however, disorganization at schools has already been linked to other deviant behaviors, such as bullying (Bradshaw, Sawyer, & O'Brennan, 2009; Khoury-Kassabri, Benbenishty, Astor, & Zeira, 2004), and an increased risk for violence at school (Birnbaum et al., 2003; Stewart, 2003).

The neighborhood variables showed mixed results. Neighborhood disorganization was not significant in the regression models examining downloading. On the other hand, neighborhood integration was significantly and negatively associated with downloading. Surprisingly, neighborhood attachment was a positive and significant predictor of downloading. It is difficult to say why neighborhood attachment is positively associated with downloading, as no other study has examined this connection before. A separate crosstab analysis revealed that there is a similar increase of those with and without downloading experience in tandem with increasing neighborhood attachment scores. Thus, this positive association is partially a statistical artifact of regression analysis. Having

said that, if neighborhood attachment can be interpreted as one's attachment to a good, organized or a well-off neighborhood, which would be the antithesis of social disorganization, i.e., neighborhoods that have been associated with community problems in general, poverty and deviant behavior (Haynie, Silver, & Teasdale, 2006; Shaw & McKay, 1942; Wilson & Kelling, 1982), it is possible that affordability and socioeconomic status are the factors to be taken into account. Research has shown that middle-class children access the internet more often (Livingstone & Helsper, 2007), thus one could argue that there is a connection between more frequent downloading, better neighborhoods and neighborhood attachment.

For hacking, neighborhood attachment and integration didn't show any significance, but neighborhood disorganization was a significant predictor. No other study has analyzed neighborhood disorganization and hacking behavior, thus further research is needed to corroborate these findings. Is it because socially disorganized neighborhoods exhibit more crime in general or there are some other factors in play here? Overall, these results indicate that neighborhood plays differing roles for hacking and downloading, although there are still many unanswered questions.

The regression models with all of the individual, family, school and neighborhood variables explained only 10% and 11% of variance for downloading and hacking perpetration respectively. These numbers were lower than all of the same models with other delinquency items as dependent variables ranging between 13% and 25%. The data suggest that when it comes to cyber deviance, the established sociological and criminological theories explain some of the perpetration, but their use is limited and better suited to offline deviant behavior.

In light of these findings, there is a fair amount evidence to suggest the development of new theories and measures that would account for this unexplained variance in cyber deviance. Various theories of crime and deviance in cyberspace have already shed some light on the issue (Jaishankar, 2008; Suler, 2004). Previous studies have shown how particular aspects of the Internet influence deviant behavior in cyberspace (Berson & Berson, 2005; Görzig & Ólafsson, 2013; Lapidot-Lefler & Barak, 2012; Sproull & Kiesler, 1986; Udris, 2014). It is clear that there are certain aspects that set online behavior apart. However, the findings from this study indicate that we should not completely forget the established criminological and sociological theories when it comes to the Internet. While exploring new theoretical perspectives, future studies should try to incorporate some of the traditional factors as well in order to gain a fuller understanding. Which online or offline factors influence particular behaviors in cyberspace? Is it the same for trolling, digital piracy or cyber bullying? The range of possible online misbehaviors and deviance is relatively large and, although including all of the possible measures in one study might be difficult, it could shed some light on some of these issues.

Limitations

First, the basic limitation of this study is that it only measures downloading and hacking, thus other online deviant behaviors, for example, cyber bullying cannot be examined. Second, each country participating in the ISRD-2 study did their own data sampling and gathering, therefore inconsistencies and comparison errors are likely. Third, the questionnaire was developed in English and then translated to each of the other languages, and then again back translated. While this is the best approach available, cultural

differences as well as different meanings for the same word, or non-existence of the same concept in other languages complicates comparison. Fourth, the large number of theories included in the survey meant that some items had to be excluded, resulting in partial tests. Fifth, the survey data is cross-sectional and should be treated as such (e.g., the study did not measure prior offending). Longitudinal research is necessary to corroborate the findings from this study.

References

- Akers, R. L., Krohn, M. D., Lanza-Kaduce, L., & Radosevich, M. (1979). Social learning and deviant behavior: A specific test of a general theory. *American Sociological Review*, 44(4), 636-655. doi: 10.1177/0022427897034004005
- Aoyama, I., Barnard-Brak, L., & Talbert, T. L. (2011). Cyberbullying Among High School Students. *International Journal of Cyber Behavior, Psychology and Learning*, 1(1), 25-35. doi: 10.4018/ijcbpl.2011010103
- Avci, R., & GÜÇRAY, S. I. S. (2013). The Relationships among Interparental Conflict, Peer, Media Effects and the Violence Behaviour of Adolescents: The Mediator Role of Attitudes towards Violence. *Educational Sciences: Theory & Practice*, 13(4), 2005-2015. doi: 10.12738/estp.2013.4.1950
- Bachmann, M. (2010). The risk propensity and rationality of computer hackers. *International Journal of Cyber Criminology*, 4(1-2), 643-656.
- Barnes, G. M., Hoffman, J. H., Welte, J. W., Farrell, M. P., & Dintcheff, B. A. (2006). Effects of Parental Monitoring and Peer Deviance on Substance Use and Delinquency. *Journal of Marriage and Family*, 68(4), 1084-1104. doi: 10.1111/j.1741-3737.2006.00315.x
- Becker, H. S. (1963). *Outsiders: Studies in the Sociology of Deviance*. New York: The Free Press of Glencoe.
- Beebe, N. L., & Guynes, J. (2006). *A Model for Predicting Hacker Behavior*. Paper presented at the AMCIS 2006 Proceedings, Acapulco, Mexico.
- Berson, I. R., & Berson, M. J. (2005). Challenging Online Behaviors of Youth Findings From a Comparative Analysis of Young People in the United States and New Zealand. *Social Science Computer Review*, 23(1), 29-38. doi: 10.1177/0894439304271532
- Birnbaum, A. S., Lytle, L. A., Hannan, P. J., Murray, D. M., Perry, C. L., & Forster, J. L. (2003). School functioning and violent behavior among young adolescents: A contextual analysis. *Health Education Research*, 18(3), 389-403. doi: 10.1093/her/cyf036
- Bossler, A. M., & Burruss, G. W. (2011). The General Theory of Crime and Computer Hacking: Low Self-Control Hackers. In T. J. Holt & B. H. Schell (Eds.), *Corporate hacking and technology-driven crime: Social dynamics and implications* (pp. 38-67). Hershey, PA: IGI Global.
- Bradshaw, C. P., Sawyer, A. L., & O'Brennan, L. M. (2009). A social disorganization perspective on bullying-related attitudes and behaviors: The influence of school context. *American Journal of Community Psychology*, 43(3-4), 204-220. doi: 10.1007/s10464-009-9240-1
- Burruss, G. W., Bossler, A. M., & Holt, T. J. (2012). Assessing the Mediation of a Fuller Social Learning Model on Low Self-Control's Influence on Software Piracy. *Crime & Delinquency*, 59(8), 1157-1184. doi: 10.1177/0011128712437915

- Cernkovich, S. A., & Giordano, P. C. (1992). School Bonding, Race, and Delinquency. *Criminology*, *30*(2), 261-291. doi: 10.1111/j.1745-9125.1992.tb01105.x
- Cluley, R. (2013). Downloading deviance: Symbolic interactionism and unauthorised file-sharing. *Marketing Theory*, *13*(3), 263-274. doi: 10.1177/1470593113487189
- Cornell, D. G., & Loper, A. B. (1998). Assessment of violence and other high-risk behaviors with a school survey. *School Psychology Review*, *27*(2), 317-330.
- Crosswhite, J. M., & Kerpelman, J. L. (2012). Parenting and Children's Self-Control: Concurrent and Longitudinal Relations. *Deviant Behavior*, *33*(9), 715-737. doi: 10.1080/01639625.2011.647597
- Day, R. D., & Padilla-Walker, L. M. (2009). Mother and Father Connectedness and Involvement During Early Adolescence. *Journal of Family Psychology*, *23*(6), 900-904. doi: 10.1037/a0016438
- Donner, C. M., Marcum, C. D., Jennings, W. G., Higgins, G. E., & Banfield, J. (2014). Low self-control and cybercrime: Exploring the utility of the general theory of crime beyond digital piracy. *Computers in Human Behavior*, *34*, 165-172. doi: 10.1016/j.chb.2014.01.040
- Dornbusch, S. M., Erickson, K. G., Laird, J., & Wong, C. A. (2001). The Relation of Family and School Attachment to Adolescent Deviance in Diverse Groups and Communities. *Journal of Adolescent Research*, *16*(4), 396-422. doi: 10.1177/0743558401164006
- Eisenberg, M. E., Olson, R. E., Neumark-Sztainer, D., Story, M., & Bearinger, L. H. (2004). Correlations between family meals and psychosocial well-being among adolescents. *Archives of pediatrics & adolescent medicine*, *158*(8), 792-796.
- Esping-Andersen, G. (1990). *The Three Worlds of Welfare Capitalism*. Princeton, NJ: Princeton University Press.
- Fulkerson, J. A., Story, M., Mellin, A., Leffert, N., Neumark-Sztainer, D., & French, S. A. (2006). Family Dinner Meal Frequency and Adolescent Development: Relationships with Developmental Assets and High-Risk Behaviors. *Journal of Adolescent Health*, *39*(3), 337-345. doi: 10.1016/j.jadohealth.2005.12.026
- Gordon, S., & Ma, Q. (2003). *Convergence of Virus Writers and Hackers: Fact or Fantasy?* Cupertino, CA: Symantec Security.
- Görzig, A., & Ólafsson, K. (2013). What Makes a Bully a Cyberbully? Unravelling the Characteristics of Cyberbullies across Twenty-Five European Countries. *Journal of Children and Media*, *7*(1), 9-27. doi: 10.1080/17482798.2012.739756
- Gottfredson, M. R., & Hirschi, T. (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.
- Grasmick, H. G., Tittle, C. R., Bursik, R. J., & Arneklev, B. J. (1993). Testing the core empirical implications of Gottfredson and Hirschi's general theory of crime. *Journal of Research in Crime and Delinquency*, *30*(1), 5-29. doi: 10.1177/0022427893030001002
- Griffin, K. W., Botvin, G. J., Scheier, L. M., Diaz, T., & Miller, N. L. (2000). Parenting Practices as Predictors of Substance Use, Delinquency, and Aggression Among Urban Minority Youth: Moderating Effects of Family Structure and Gender. *Psychology of Addictive Behaviors*, *14*(2), 174-184. doi: 10.1037/0893-164x.14.2.174
- Gunter, W. D., Higgins, G. E., & Gealt, R. E. (2010). Pirating youth: examining the correlates of digital music piracy among adolescents. *International Journal of Cyber Criminology*, *4*(1&2), 657-671.

- Haynie, D. L., Silver, E., & Teasdale, B. (2006). Neighborhood Characteristics, Peer Networks, and Adolescent Violence. *Journal of Quantitative Criminology*, 22(2), 147-169. doi: 10.1007/s10940-006-9006-y
- Herrenkohl, T. I., Maguin, E., Hill, K. G., Hawkins, J. D., Abbott, R. D., & Catalano, R. F. (2000). Developmental Risk Factors for Youth Violence. *Journal of Adolescent Health*, 26(3), 176-186. doi: 10.1016/S1054-139X(99)00065-8
- Higgins, G. E. (2005). can low self-control help with the understanding of the software piracy problem? *Deviant Behavior*, 26(1), 1-24. doi: 10.1080/01639620490497947
- Higgins, G. E. (2006). Gender differences in software piracy: The mediating roles of self-control theory and social learning theory. *Journal of Economic Crime Management*, 4(1), 1-30.
- Higgins, G. E. (2007). Digital piracy, self-control theory, and rational choice: An examination of the role of value. *International Journal of Cyber Criminology*, 1(1), 33-55.
- Higgins, G. E., Fell, B. D., & Wilson, A. L. (2006). Digital piracy: Assessing the contributions of an integrated self - control theory and social learning theory using structural equation modeling. *Criminal Justice Studies*, 19(1), 3-22. doi: 10.1080/14786010600615934
- Higgins, G. E., & Makin, D. A. (2004a). Does social learning theory condition the effects of low self-control on college students' software piracy. *Journal of Economic Crime Management*, 2(2), 1-22.
- Higgins, G. E., & Makin, D. A. (2004b). Self-control, deviant peers, and software piracy. *Psychological Reports*, 95(3 Pt 1), 921-931. doi: 10.2466/pr0.95.3.921-931
- Higgins, G. E., & Wilson, A. L. (2006). Low Self-Control, Moral Beliefs, and Social Learning Theory in University Students' Intentions to Pirate Software. *Security Journal*, 19(2), 75-92. doi: 10.1057/Palgrave.sj.8350002
- Higgins, G. E., Wolfe, S. E., & Marcum, C. D. (2008). Digital Piracy: An Examination of Three Measurements of Self-Control. *Deviant Behavior*, 29(5), 440-460. doi: 10.1080/01639620701598023
- Hinduja, S. (2007). Neutralization theory and online software piracy: An empirical analysis. *Ethics and Information Technology*, 9(3), 187-204. doi: 10.1007/s10676-007-9143-5
- Hinduja, S. (2008). Deindividuation and Internet software piracy. *Cyberpsychology and Behavior*, 11(4), 391-398. doi: 10.1089/cpb.2007.0048
- Hinduja, S., & Ingram, J. R. (2009). Social learning theory and music piracy: the differential role of online and offline peer influences. *Criminal Justice Studies*, 22(4), 405-420. doi: 10.1080/14786010903358125
- Hirschi, T. (1969). *Causes of Delinquency*. Berkeley, CA: University of California Press.
- Holt, T. J., Bossler, A. M., & May, D. C. (2012). Low Self-Control, Deviant Peer Associations, and Juvenile Cyberdeviance. *American Journal of Criminal Justice*, 37(3), 378-395. doi: 10.1007/s12103-011-9117-3
- Holt, T. J., Burruss, G. W., & Bossler, A. M. (2010). Social learning and cyber-deviance: Examining the importance of a full social learning model in the virtual world. *Journal of Crime and Justice*, 33(2), 31-61. doi: 10.1080/0735648x.2010.9721287
- Holt, T. J., & Kilger, M. (2008). *Techcrafters and Makecrafters: A Comparison of Two Populations of Hackers*. Paper presented at the 2008 WOMBAT Workshop on Information Security Threats Data Collection and Sharing.

- Huesmann, L. R., & Guerra, N. G. (1997). Children's normative beliefs about aggression and aggressive behavior. *Journal of Personality and Social Psychology*, 72(2), 408–419. doi: 10.1037/0022-3514.72.2.408
- Ikramullah, E., & Cui, C. (2009). Parents matter: The role of parents in teens' decisions about sex. Retrieved August 21, from Child Trends
- Jaishankar, K. (2008). Space Transition Theory of Cyber Crimes. In F. Schmalleger & M. Pittaro (Eds.), *Crimes of the Internet* (pp. 283–301). Upper Saddle River, NJ: Prentice Hall.
- Jordan, T., & Taylor, P. (1998). A sociology of hackers. *Sociological Review*, 46(4), 757–780. doi: 10.1111/1467-954x.00139
- Khoury-Kassabri, M., Benbenishty, R., Astor, R. A., & Zeira, A. (2004). The Contributions of Community, Family, and School Variables to Student Victimization. *American Journal of Community Psychology*, 34(3–4), 187–204. doi: 10.1007/s10464-004-7414-4
- Knoester, C., & Haynie, D. L. (2005). Community Context, Social Integration Into Family, and Youth Violence. *Journal of Marriage and Family*, 67(3), 767–780. doi: 10.1111/j.1741-3737.2005.00168.x
- Kong, J., & Lim, J. (2012). The longitudinal influence of parent–child relationships and depression on cyber delinquency in South Korean adolescents: A latent growth curve model. *Children and Youth Services Review*, 34(5), 908–913. doi: 10.1016/j.childyouth.2012.01.020
- Lapidot-Lefler, N., & Barak, A. (2012). Effects of anonymity, invisibility, and lack of eye-contact on toxic online disinhibition. *Computers in Human Behavior*, 28(2), 434–443. doi: 10.1016/j.chb.2011.10.014
- Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: children, young people and the digital divide. *New Media & Society*, 9(4), 671–696. doi: 10.1177/1461444807080335
- Marshall, I. H., & Enzmann, D. (2012). Methodology and Design of the ISRD-2 Study. In J. Junger-Tas, I. H. Marshall, D. Enzmann, M. Killias, M. Stekete & B. Gruszczynska (Eds.), *The Many Faces of Youth Crime* (pp. 21–65). New York: Springer.
- McConville, D. W., & Cornell, D. G. (2003). Aggressive attitudes predict aggressive behavior in middle school students. *Journal of Emotional and Behavioral disorders*, 11(3), 179–187. doi: 10.1177/10634266030110030501
- Morris, R. G., & Higgins, G. E. (2010). Criminological theory in the digital age: The case of social learning theory and digital piracy. *Journal of Criminal Justice*, 38(4), 470–480. doi: 10.1016/j.jcrimjus.2010.04.016
- Musick, K., & Meier, A. (2012). Assessing causality and persistence in associations between family dinners and adolescent well - being. *Journal of Marriage and Family*, 74(3), 476–493. doi: 10.1111/j.1741-3737.2012.00973.x
- Navarro, J. N., Marcum, C. D., Higgins, G. E., & Ricketts, M. L. (2014). Addicted to pillaging in cyberspace: Investigating the role of internet addiction in digital piracy. *Computers in Human Behavior*, 37, 101–106. doi: 10.1016/j.chb.2014.04.012
- Nelson, B. (2014). Computer science: Hacking into the cyberworld. *Nature*, 506(7489), 517–519. doi: 10.1038/nj7489-517a
- Organisation for Economic Co-operation and Development. (2012). OECD Internet Economy Outlook. Retrieved from <http://www.oecd.org/>

- Osgood, D. W., & Anderson, A. L. (2004). Unstructured Socializing and Rates of Delinquency. *Criminology*, 42(3), 519-549. doi: 10.1111/j.1745-9125.2004.tb00528.x
- Osgood, D. W., Wilson, J. K., O'Malley, P. M., Bachman, J. G., & Johnston, L. D. (1996). Routine activities and individual deviant behavior. *American Sociological Review*, 61, 635-655.
- Prensky, M. (2012). Digital natives, digital immigrants. *On the Horizon*. MCB University Press, 1, 1-6.
- Rogers, M. K., Seigfried, K., & Tidke, K. (2006). Self-reported computer criminal behavior: A psychological analysis. *Digital Investigation*, 3, 116-120. doi: 10.1016/j.diin.2006.06.002
- Saint-Arnaud, S., & Bernard, P. (2003). Convergence or Resilience? A Hierarchical Cluster Analysis of the Welfare Regimes in Advanced Countries. *Current Sociology*, 51(5), 499-527. doi: 10.1177/00113921030515004
- Sampson, R. J., Morenoff, J. D., & Earls, F. (1999). Beyond social capital: Spatial dynamics of collective efficacy for children. *American Sociological Review*, 64, 633-660. doi: 10.2307/2657367
- Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy. *Science*, 277(5328), 918-924. doi: 10.1126/science.277.5328.918
- Schneider, S. K., O'Donnell, L., Stueve, A., & Coulter, R. W. S. (2012). Cyberbullying, school bullying, and psychological distress: a regional census of high school students. *American Journal of Public Health*, 102(1), 171-177. doi: 10.2105/AJPH.2011.300308
- Seigfried-Spellar, K. C., & Treadway, K. N. (2014). Differentiating Hackers, Identity Thieves, Cyberbullies, and Virus Writers by College Major and Individual Differences. *Deviant Behavior*, 35(10), 782-803. doi: 10.1080/01639625.2014.884333
- Sen, B. (2010). The relationship between frequency of family dinner and adolescent problem behaviors after adjusting for other family characteristics. *Journal of Adolescence*, 33(1), 187-196. doi: 10.1016/j.adolescence.2009.03.011
- Shaw, C. R., & McKay, H. D. (1942). *Juvenile Delinquency and Urban Areas*. Chicago: University of Chicago Press.
- Skinner, W. F., & Fream, A. M. (1997). A Social Learning Theory Analysis of Computer Crime among College Students. *Journal of Research in Crime and Delinquency*, 34(4), 495-518. doi: 10.1177/0022427897034004005
- Spriggs, A. L., Iannotti, R. J., Nansel, T. R., & Haynie, D. L. (2007). Adolescent bullying involvement and perceived family, peer and school relations: Commonalities and differences across race/ethnicity. *Journal of Adolescent Health*, 41(3), 283-293.
- Sproull, L., & Kiesler, S. (1986). Reducing Social Context Cues: Electronic Mail in Organizational Communication. *Management Science*, 32(11), 1492-1512. doi: 10.1287/mnsc.32.11.1492
- Stewart, E. A. (2003). School social bonds, school climate, and school misbehavior: A multilevel analysis. *Justice Quarterly*, 20(3), 575-604. doi: 10.1080/07418820300095621
- Suler, J. R. (2004). The online disinhibition effect. *Cyberpsychology and Behavior*, 7(3), 321-326. doi: 10.1089/1094931041291295
- Sykes, G. M., & Matza, D. (1957). Techniques of neutralization: A theory of delinquency. *American Sociological Review*, 22(6), 664-670. doi: 10.2307/2089195

- Turgeman-Goldschmidt, O. (2005). Hackers' Accounts: Hacking as a Social Entertainment. *Social Science Computer Review*, 23(1), 8-23. doi: 10.1177/0894439304271529
- Turgeman-Goldschmidt, O. (2008). Meanings that hackers assign to their being a hacker. *International Journal of Cyber Criminology*, 2(2), 382-396.
- Udris, R. (2014). Cyberbullying among high school students in Japan: Development and validation of the Online Disinhibition Scale. *Computers in Human Behavior*, 41, 253-261. doi: 10.1016/j.chb.2014.09.036
- Vazsonyi, A. T., & Pickering, L. E. (2003). The importance of family and school domains in adolescent deviance: African American and Caucasian youth. *Journal of Youth and Adolescence*, 32(2), 115-128.
- Wada, K., & Fukui, S. (1994). Prevalence of tobacco smoking among junior high school students in Japan and background life style of smokers. *Addiction*, 89(3), 331-343. doi: 10.1111/j.1360-0443.1994.tb00900.x
- Wiatrowski, M. D., Griswold, D. B., & Roberts, M. K. (1981). Social control theory and delinquency. *American Sociological Review*, 46(5), 525-541. doi: 10.2307/2094936
- Williams, S. K., & Kelly, F. D. (2005). Relationships Among Involvement, Attachment, and Behavioral Problems in Adolescence: Examining Father's Influence. *The Journal of Early Adolescence*, 25(2), 168-196. doi: 10.1177/0272431604274178
- Wilmers, N., Enzmann, D., Schaefer, D., Herbers, K., Greve, W., & Wetzels, P. (2002). *Jugendliche in Deutschland zur Jahrtausendwende: Gefährlich oder gefährdet? Ergebnisse wiederholter, repräsentativer Dunkelfelduntersuchungen zu Gewalt und Kriminalität im Leben junger Menschen 1998-2000*. Baden-Baden: Nomos.
- Wilson, J. Q., & Kelling, G. L. (1982). Broken Windows. *Atlantic Monthly*(March), 29-38.
- Yar, M. (2005). Computer hacking: Just another case of juvenile delinquency? *The Howard Journal of Criminal Justice*, 44(4), 387-399. doi: 10.1111/j.1468-2311.2005.00383.x
- Young, R., Zhang, L., & Prybutok, V. R. (2007). Hacking into the Minds of Hackers. *Information Systems Management*, 24(4), 281-287. doi: 10.1080/10580530701585823
- Zhang, L., Young, R., & Prybutok, V. (2008). A Comparison of the Inhibitors of Hacking vs. Shoplifting. In S. Clarke (Ed.), *Evolutionary Concepts in End User Productivity and Performance: Applications for Organizational Progress: Applications for Organizational Progress*. Hershey, PA: IGI Global.