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Computer-Specific Parental Management and Online Deviance across Gender in South Korea: A Test of Self-Control Theory

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Abstract

Deviant behaviors on the Internet by adolescents have increased due to increased opportunity for using online technology. Based on Gottfredson and Hirschi's self-control theory, parental management influences online deviance by mediating low self-control. This study used data collected by the Korea Institute of Criminology in 2009. The results strongly supported the self-control theory's propositions that parental management increased children's self-control, and their self-control decreased online deviance. Thus, it is important to control online deviance by appropriate parenting concerning computer use. However, this study also found different results across gender.

Keywords: online deviance, low self-control, parental management, gender.

Introduction

Online deviance is an activity that breaks Internet rules and norms; including, but not necessarily limited to activities considered illegal (McDonald, Horstmann, Strom, & Pope, 2009). Over the last two decades, there has been an increase in deviant behavior on the Internet by adolescents, including digital piracy and online harassment (Daniel, 2005). According to a study by the Business Software Alliance (BSA) (2012), almost 57% of the world's personal computer users expressed an intention to pirate software. The International Federation of Phonographic Industries (IFPI) (2010) reported that music industries across the world lost an estimated 4.2 billion dollars in 2009 via illegally downloaded songs. According to a current report from the organization (IFPI, 2015), digital music piracy still remains a substantial problem for the music industry, specifically in Asia.

Regarding online harassment, Finn (2004) found that 10% to 15% of college students in her study had experienced online harassment. According to a national survey (Jones, Mitchell, & Finkelhor, 2013), the rates of youth online harassment have increased from 6% in 2000 to 11% in 2010. Increasing technology allows for more opportunities for

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deviant behavior on the Internet (Power, 2000; Rogers, Smoak, & Liu, 2006; Ziyanak, 2014). This new Internet technology has escalated the rates of youth online deviance (Donner, Marcum, Jennings, Higgins, & Banfield, 2014), such as the development of virus ware, cyber terrorism, computer hacking, online harassment, and certain self-harm behaviors (Giles, 2006; Joinson, 2005). Livingstone (2003) noted that children and young people are in danger as a result of being victimized by deviance on the Internet without parental control. Further, several studies have found that online deviant behaviors are negatively related to parental controls (Eastin, Greenberg, & Hofschire, 2006; Ybarra, Diener-West, & Leaf, 2007).

Regarding online deviance, Gottfredson and Hirschi's (1990) self-control theory has provided a useful theoretical framework (Donner et al., 2014). In particular, self-control theory emphasized that parental management is a principal influence on the development of their children's self-control (Gibbs, Giever, & Martin, 1998). For example, Gibbs, Giever, and Higgins (2003) found that parental management influences deviance by mediating self-control. Further, prior research has shown the association between self-control and online deviance: for example, online harassment (Jones, et al., 2013; Khunrana, Bleakley, Jordan, Romer, 2015; Ybarra & Mitchell, 2004), software piracy (Higgins, 2005, 2006; Higgins, Fell, & Wilson, 2006, 2007; Higgins, Wolfe, & Marcum, 2008; Hinduja, 2008; Kim & Kim, 2015; Malin & Fowers, 2009; Moon, McCluskey, McCluskey, & Lee, 2013), and various types of cyber-deviance (i.e. hacking) (Holt, Bossler, & May, 2010).

However, research that deals with all concepts regarding parental management, low self-control, and online deviance, has been relatively rare. Furthermore, there are no known studies concerning this relationship, especially structural equation modeling (SEM) using Korean data. In response to these issues, this study intends to examine that parental management has an influence on online deviance, by mediating low self-control based on Gottfredson and Hirschi's (1990) self-control theory. In addition, this study intends to examine supplementary models whether gender differences would occur.

Theoretical Background

Gottfredson and Hirschi's (1990) self-control theory posits that low self-control is the cause of deviant and criminal behavior. Self-control is instilled in the individual through effective parenting, which requires direct control by the parent as they monitor the child, recognize deviance when it occurs, and effectively punish that deviance (Gottfredson & Hirschi, 1990). Through showing interest in and affection for the child, as well as effectively parenting them, the child will have higher levels of self-control and be unlikely to be drawn into the allure of crime and deviance. While many studies have used parenting as a direct predictor to deviant behaviors (see a meta-analysis [Hoeve, Dubas, Eichelsheim, van der Laan, Smmenk, & Gerris, 2009]), parental management is a principal influence on the development of their children's self-control (Gibbs et al., 1998), and this self-control prevents deviant behaviors (Gibbs et al., 2003). According to Gottfredson and Hirschi (1990), self-control becomes solidified between the ages of 8 and 12, and can be expected to remain stable after that. Those who possess low self-control have several key characteristics; they are impulsive risk-takers, who are physical rather than verbal, they are short-sighted and insensitive to others, often lack persistence and suffer from poor relationships as a consequence (Gottfredson & Hirschi, 1990).

Using the concept of low self-control, many studies have examined various types of deviance and crimes (e.g., academic dishonesty [Cochran, Wood, Sellers, Wilkerson, Chamlin, 1998], bullying [Moon, Hwang, & McCluskey, 2011], police misconduct [Donner & Jennings, 2014], and substance use [Desmond, Bruce, & Stacer, 2012]). One meta-analysis (Pratt & Cullen, 2000) indicated that Gottfredson and Hirschi's (1990) self-control theory has received much empirical support. Furthermore, prior research has examined a variety of forms of online deviance using the theoretical framework of self-control theory. Digital piracy has been found to be related to low self-control (Higgins 2005; 2006; Higgins et al., 2006; Higgins et al., 2008). In Donner and colleagues' (2014) study, low self-control was found to have a relationship with a variety of deviant online behaviors, including threatening/insulting others through email or instant messages, hacking into an unauthorized area of the internet, and using another person's personal information on the internet without his/her permission. Additionally, Kim and Kim (2015) examined the relationship between computer piracy, self-control, and time spent on the computer using a Korean sample. Regarding online harassment, Baek, Losavio, and Higgins's (2016) found that low self-control was a significant predictor to account for it. All aforementioned researchers found strong support for Gottfredson & Hirschi's (1990) propositions, that adolescents low in self-control were more likely to commit online deviance.

Though the link between low self-control and a variety of forms of online deviance have been supported in research, the role other variables, such as gender and culture, play in this relationship remains unclear. Specifically, results of research are often mixed regarding self-control and gender (Higgins, 2006). For example, Moon and his colleagues (2012) found low self-control played a significant role in the illegal use of another persons' resident registration number in their sample, yet they also found opportunity and gender to have a significant effect. In this study, opportunity factors impacted illegal downloading differently between genders. For example, hours of computer usage increase illegal downloading for boys, while this opportunity factor did not have any significant effect for girls (Moon et al., 2012). Work by Longshore, Turner, and Stein (1996) found that low self-control could not explain gender differences for offenses in their sample. However, Tittle, Ward, and Gramick (2003) showed that low self-control could account for gender differences in deviance amongst their sample. Research by Marcum, Higgins, Freiburger, and Ricketts (2012) found females in their sample to be over 2.5 times more likely to have posted gossip online about others in the past year. However, they also found that ratio of change for self-control and online harassment was almost 1:1; for every one-unit decrease in self-control there was a 1.04-unit increase in perpetrating online harassment, regardless of gender (Marcum et al., 2012).

While Gottfredson and Hirschi's (1990) self-control theory has received empirical support, some areas of the theory have been called into question and continue to be tested by researchers (Moon et al., 2012). The study of online deviance is new; however, what prior research exists has been successful in using self-control theory to explain this behavior (Tittle et al., 2003). Further, studies, which utilize international samples, are often underrepresented in criminological research; these studies have the ability to discover if criminological theories are valuable across cultures. In response to these issues, this study intends to conduct analysis using Structural Equation Modeling (SEM), which allows for the specification of regression structures among the latent variables (Byrne,

2012). For this SEM, the present study assumes that parental management influences online deviance with the inclusion of the mediating variables of low self-control (Model 1). Specifically, additional models across gender (Models 2 and 3) are presented in this study to discover whether gender differences would occur.

Regarding these models, this study will examine five hypotheses.

Hypothesis 1: Parental management decreases online deviance.

Hypothesis 2: Parental management decreases low self-control.

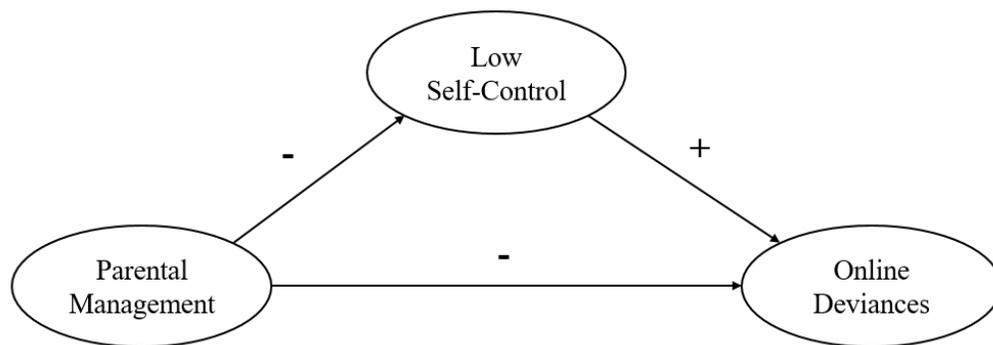
Hypothesis 3: Low self-control increases online deviance.

Hypothesis 4: Parental management decreases online deviance through low self-control.

Hypothesis 5: Across gender, parental management and low self-control have different impacts on online deviance.

Figure 1 provides a graphical presentation of all the hypotheses.

Figure 1. Research Model



Method

Data

The data used in this study was collected by the Korean Institute of Criminology (KIC) in 2009. Their data was a one-time cross-sectional study (collection time-period from August 28th 2009 to September 11th 2009), which was compiled from self-report surveys. It was collected from elementary and middle school students through stratified cluster sampling in Seoul (Choi, 2009). The data was donated to the Korean Social Science Data Archive in 2014 (data code: A1-2009-0119), which is a non-profit social science data archive established by integrating the Korea Social Science Library and the Korean Social Survey Data Archive. The purpose of the original data was an evaluation of the level of awareness of cybercrime law and the development of the cybercrime prevention program as referenced in the Elementary Education Act. The main research content included ethics information on cyber-crime, cybercrime-related legal knowledge, the victim's awareness of cybercrime, cybercrime damage experience, ties and conflict with computer-related parenting, and the number of cybercrime friends. The total sample size was 1,091; 505 (46.3%) of which were female and 586 (53.7%) of which were male. The age of respondents was between 11 and 15; the grades were 5th to 6th in elementary, and 1st in middle school.

Measures

With regard to online deviance, this study used the definition that online deviance is an activity that breaks Internet rules and norms; including, but not necessarily limited to activities considered illegal acts (McDonald et al., 2009). Concerning this definition, this study used three items as a dependent variable, including digital piracy, online harassment, and other types of online deviance (e.g., thieving of someone's game items or cyber-money). The items used a question, "If you have done the following actions (digital piracy, online harassment, and other types of online deviance) over the last six months, please write down how many times you did." Thus, higher scores indicated that respondents had more experiences of online deviance.

Gottfredson and Hirschi (1990) assumed that self-control would be established, then internalized early in life, and become stable across the life course; thus, parental management in childhood is an important component in this theory. This study chose parental management as an exogenous variable. In particular, the measure of parental management narrowly focused on computer-specific parenting in order to enhance interpretations about online deviance. The measurement utilized 3 items, which included the following questions: "My parents limit my time using computers, so I can use the computer during allowed time periods," "My parents observe me when I am using the computer," and "My parents notice what I do when using the computer." Responses were coded by a five-point scale (1 = never to 5 = always). Respondents with higher scores on these variables were more managed by their parents.

The mediating variable was low self-control, defined by Gottfredson and Hirschi (1990); their theory described individuals with low levels of self-control as being "impulsive, insensitive, physical (as opposed to verbal), risking, short-sighted, and nonverbal" (Gottfredson & Hirschi, 1990, p 90). Therefore, this study used 4 items related to this definition: "I tend to do my job without a plan," "I always act out on a whim," "I behave impulsively in many cases," and "I act as soon as possible no matter what happens later." The answer was coded from 1 = never to 5 = always. Higher scores indicated lower self-control.

Analysis Plan

Using the Korean data (Choi, 2009), this study conducted data analyses in a series of steps. The first step in the analysis involved descriptive statistics (mean, standard deviation, skewness, and kurtosis) in order to determine the normality of the observed measures. This study used a criterion that a variable is non-normal when skewness is above 3 and kurtosis is above 10 (Gravetter & Wallnau, 2014). Second, this study conducted a bivariate statistical analysis (correlation between observed variables) to show that the variables shared suitable levels of variation. The third step was a presentation of a measurement model, Confirmatory Factor Analysis (CFA), to examine the measurement qualities. CFA is able to provide a test of *a priori* hypotheses of how the observed variables may indicate the latent variables (Morris & Higgins, 2010). Furthermore, factor loadings (λ) are important to confirm that the observed variables indicate the latent variables. If lambda (λ) were higher than .50, the observed variables would be statistically significant to account for the latent variables (Kline, 2016). Next, to test the hypotheses that parental management impacts online deviance with mediating low self-control based on Gottfredson and



Hirschi’s self-control theory, the present study conducted several SEMs, with the goodness-of-fit of the model also considered in order to examine gender differences.

To determine if the model fits the data for CFA and SEM, this study used several criteria such as the comparative fit indexes (CFI), the root mean squared error of approximation (RMSEA), and the standardized root mean of the residual (SRMR). If CFI are higher than .95, the goodness-of-fit is deemed excellent (Kline, 2016). The goodness-of-fit is very good if the RMSEA is lower than .05, good if it is .05-.08, and not good if it is higher than .10 (Hu & Bentler, 1999). The SRMR would be .05 or below (Hu & Bentler, 1999).

Results

Descriptive Statistics

This study analyzed descriptive statistics in order to determine the normality of the observed measures. Most observed variables did not have problems of normality; skewness was less than 3, and kurtosis was less than 10, meeting Gravetter and Wallnau’s (2014) thresholds for normality. The means, standard deviations, maximum and minimum values, skewness, and kurtosis of observed variables that were used for CFA and SEM are presented in Table 1. The “notice of computer use” among “parental management” variables had the highest mean (3.63) among these observed variables ($SD = 1.26$, skewness = $-.68$, and kurtosis = $-.58$). The “other types of online deviance” among “online deviance” variables had the lowest mean (2.08) among them ($SD = 4.89$, skewness = 2.78 , and kurtosis = 6.83).

Table 1. Sample Descriptive Statistics of Observed Measures

| | Variables | Mean | SD | Range | Skewness | Kurtosis |
|---------------------|---------------------------------------------|------|------|-------|----------|----------|
| Parental Management | Control of computer use time | 3.04 | 1.37 | 1-5 | -.04 | -1.23 |
| | Observation of computer use | 2.09 | 1.12 | 1-5 | .90 | -.03 |
| | Notice of computer use | 3.63 | 1.26 | 1-5 | -.68 | -.58 |
| Low Self-control | No plan | 2.57 | 1.10 | 1-5 | .29 | -.55 |
| | Insensitive | 2.58 | 1.11 | 1-5 | .24 | -.67 |
| | Impulsive | 2.29 | 1.07 | 1-5 | .51 | -.43 |
| Online Deviance | Short-sighted | 2.34 | 1.10 | 1-5 | .51 | -.48 |
| | Illegal downloading w/t 6 months | 2.30 | 5.35 | 0-20 | 2.58 | 5.41 |
| | Online harassment w/t 6 months | 2.40 | 5.34 | 0-20 | 2.54 | 5.28 |
| | Other types of online deviance w/t 6 months | 2.08 | 4.89 | 0-20 | 2.78 | 6.83 |

Note. N=1,091.

Bivariate Statistics

The correlation matrix of observed variables indicated how much variance was shared between them. Table 2 shows that the observed variables for online deviance were positively and significantly related to items of low self-control ($r = .07$ to $.20$). In addition, four correlations regarding online deviance and parental management were negatively significant: 1) control of computer use time and online harassment ($r = -.09$, $p < .01$), 2) control of computer use time and other types of online deviance ($r = -.08$, $p < .05$), 3) observation of computer use and online harassment ($r = -.09$, $p < .01$), and 4) notice of computer use and other types of online deviance ($r = -.09$, $p < .05$). The correlation between “insensitive” and “impulsive” was the strongest in this table ($r = .60$, $p < .01$). There were no potential problems that measures would be collinear. More detailed information is presented in Table 2.

Table 2. Correlation Matrix between Observed Measures

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-------------------------------------------------|--------|--------|-------|-------|-------|-------|-------|-------|-------|----|
| 1. Control of computer using time | - | | | | | | | | | |
| 2. Observation of using computer | .42** | - | | | | | | | | |
| 3. Notice of using computer | .24** | .34** | - | | | | | | | |
| 4. No plan | -.09** | -.07* | .14** | - | | | | | | |
| 5. Insensitive | .11** | -.08* | .15** | .58** | - | | | | | |
| 6. Impulsive | .09** | -.04 | .12** | .43** | .60** | - | | | | |
| 7. Short-sighted | -.06 | -.05 | -.08* | .50** | .51** | .55** | - | | | |
| 8. Illegal downloading w/t 6 months | -.06 | -.03 | -.05 | .12** | .12** | .13** | .12** | - | | |
| 9. Online harassment w/t 6 months | -.09** | -.09** | -.03 | .12** | .14** | .20** | .18** | .31** | - | |
| 10. Other types of online deviance w/t 6 months | -.08* | -.00 | -.08* | .07* | .12** | .14** | .09** | .32** | .28** | - |

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

CFA

The results of the measurement model, which combined CFA results for the latent variables representing online deviance, parental management, and low self-control, are presented in Table 3. CFA was performed to determine if factor loadings were significant, and if the measurement model worked satisfactorily. Schumacker and Lomax (1996) and Kline (2016) explained that the χ^2 indicates rejection of the hypothesis, by defining whether the goodness-of-fit is significant. However, the χ^2 test is not the only test of the goodness-of-fit of research models. The goodness-of-fit of the model should also be assessed using RMSEA, and CFI index, which are armed with proven standards in the assessment of the goodness-of-fit.

Based on the goodness-of-fit criteria as mentioned in the analysis plan, the χ^2 was statistically significant ($\chi^2 = 95.4$, $df = 32$, $p < .01$). Although the χ^2 was not non-significant, the other model fits of this measurement model were excellent (CFI = .97, RMSEA = .05, and SRMR = .03). Table 3 also showed that the factor loadings were all statistically significant ($\lambda > .50$) except for one factor loading among parental management, which was somewhat below the standard (notice of computer use, $\lambda = .47$). However, this study retained the measure due to the fact that it has theoretical relevance. In sum, these results suggested that the model did fit the data, and convergent validity was found in these data.

Table 3. Results of Measurement model (CFA)

| Latent Variable | Observed Variable | Factor Loading |
|---------------------|--------------------------------------------------|----------------|
| Parental Management | Control of computer use time | .59** |
| | Observation of computer use | .70** |
| | Notice of computer use | .47** |
| Low Self-control | No plan | .68** |
| | Insensitive | .79** |
| | Impulsive | .74** |
| Online Deviance | Short-sighted | .70** |
| | Illegal downloading w/t 6 months | .57** |
| | Online harassment w/t 6 months | .54** |
| | Other types of online deviance w/t 6 months | .54** |
| | Chi-Square Test of Model Fit (χ^2) | 134.8** |
| | Confirmatory Fit Index (CFI) | .98 |
| | Root Mean Squared Error of Approximation (RMSEA) | .04 |
| | Standardized Root Mean of the Residual (SRMR) | .03 |

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

SEM

This study conducted analyses of structural equation modelling in order to test how parental management influences online deviance, with the mediating variables of low self-control (see Table 4). In Model 1, fit results indicated that overall results of fit statistics demonstrated excellent goodness-of fit of the model ($\chi^2 = 95.4$, $p < .01$, CFI = .97, RMSEA = .05, and SRMR = .03). This model shows that parental management negatively and significantly influences low self-control (Hypothesis 2), while parental management did not have a significant influence on online deviance (Hypothesis 1). However, low self-control positively and significantly influences online deviance (Hypothesis 3). In particular, low self-control was the most significant factor to online deviance in this model ($\beta = .30$, $p < .01$). Furthermore, Table 5 indicates that there is an indirect effect of parental management on online deviance through low self-control. That is, Hypothesis 4 (Parental management decreases online deviance through low self-control) was also supported (total effect = $-.70$, direct effect = $-.46$, and indirect effect = $-.25$).

Table 4. Results of Structural equation modeling (SEM)

| Measures | Model 1 | |
|--------------------------------------------------|------------|---------|
| | Coef. (SE) | β |
| Parental Management → Low Self-control | -.23 (.06) | -.18** |
| Parental Management → Online Deviance | -.26 (.25) | -.10 |
| Low Self-Control → Online Deviance | 1.05 (.19) | .30** |
| Chi-Square Test of Model Fit (χ^2) | 95.4** | |
| Confirmatory Fit Index (CFI) | .97 | |
| Root Mean Squared Error of Approximation (RMSEA) | .05 | |
| Standardized Root Mean of the Residual (SRMR) | .03 | |

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

Table 5. Direct/ Indirect and Total Effects of Latent Variables

| | I.V | M.V | D.V | Direct | Indirect | Total Effect |
|---------|---------------------|------------------|-----------------|-------------|-------------|--------------|
| Model 1 | Parental Management | Low Self-control | Online Deviance | -.46 (-.10) | -.25 (-.05) | -.70 (-.15) |

Note. Parentheses are standardized effects. I.V = Independent Variable, M.V = Mediating Variable, and D.V = Dependent Variable

Table 6. Structural equation modeling (SEM) results across Gender

| Measures | Model 2 for Female | | Model 3 for Male | |
|--------------------------------------------------|--------------------|---------|------------------|---------|
| | Coef. (SE) | β | Coef. (SE) | β |
| Parental Management → Low Self-control | -.22 (.07) | -.20** | -.21 (.11) | -.13 |
| Parental Management → Online Deviance | -.39 (.27) | -.13 | -.80 (.50) | -.12 |
| Low Self-Control → Online Deviance | 1.11 (.27) | .39** | 1.11 (.26) | .28** |
| Chi-Square Test of Model Fit (χ^2) | 56.97** | | 64.96** | |
| Confirmatory Fit Index (CFI) | .97 | | .97 | |
| Root Mean Squared Error of Approximation (RMSEA) | .04 | | .05 | |
| Standardized Root Mean of the Residual (SRMR) | .04 | | .04 | |

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

Table 7. Direct/ Indirect and Total Effect of Latent Variables across Gender

| | I.V | M.V | D.V | Direct | Indirect | Total Effect |
|--------------------|---------------------|------------------|-----------------|-------------|-------------|--------------|
| Model 2 for Female | Parental Management | Low Self-control | Online Deviance | -.39 (-.13) | -.24 (-.08) | -.64 (-.21) |
| Model 3 for Male | Parental Management | Low Self-control | Online Deviance | -.80 (-.12) | -.24 (-.03) | -1.04 (-.15) |

Note. Parentheses are standardized effects. I.V = Independent Variable, M.V = Mediating Variable, and D.V = Dependent Variable

Regarding Hypothesis 5 (Across gender, parental management and low self-control have different impacts on online deviance), the last step of this study was the examination of gender difference; in Table 6, Model 2 was for female adolescents, while Model 3 was for male adolescents. Like the previous model (Model 1), the model fits indicated that ranges of two models (Models 2 and 3) were proper. However, there were several differences between models; while low self-control was the most significant factor to online deviance in both models (for females, $\beta = .39$, $p < .01$ and for males, $\beta = .28$, $p < .01$), parental management did not significantly influence low self-control in the male model (Model 3), but did in the female model (Model 2) ($\beta = -.20$, $p < .01$). Furthermore, regarding mediation effects (see Table 7), low self-control in Model 2 for females had a

higher effect (standardized indirect effect = $-.08$ out of $-.21$) compared to that in Model 3 for males (standardized indirect effect = $-.03$ out of $-.15$). That is, the role of parental management would be very significant to online deviance and low self-control in Model 2 for female adolescents; in contrast, that of Model 3 for male adolescents did not have any effects to online deviance and low self-control.

Discussion

By increasing opportunities of Internet technology use (Power, 2000; Rogers et al., 2006; Ziyanak, 2014), deviant behaviors on the Internet by adolescents have increased over the last two decades (Daniel, 2005; Donner et al., 2014). Furthermore, there are various kinds of online deviance, such as cyber terrorism, computer hacking, digital piracy, online harassment, and certain self-harm behaviors (Giles, 2006; Higgins, 2005, 2006; Holt et al., 2010; Joinson, 2005). Regarding a variety of these online deviance, Gottfredson and Hirschi's (1990) self-control theory has provided a useful theoretical framework (Donner et al., 2014); Gottfredson and Hirschi (1990) claimed that low self-control could be applied to various deviant and criminal acts. Pratt and Cullen's meta-analysis (2000) indicated that Gottfredson and Hirschi's (1990) self-control theory has received much empirical support. Like many studies using various types of deviance and crimes (e.g., academic dishonesty [Cochran et al., 1998], bullying [Moon et al., 2011], police misconduct [Donner & Jennings, 2014], and substance use [Desmond et al., 2012]), prior research has supported self-control theory using a variety of forms of online deviance (e.g., digital piracy [Higgins 2005; 2006; Higgins et al., 2006; Higgins et al., 2008], illegal downloading [Moon et al., 2012], and online harassment [Baek et al., 2016]).

Despite much empirical support to self-control theory, explanation of gender differences and inclusion of all concepts in the theory have been controversial (i.e., parental management) (Baek et al., 2016; Higgins, 2006; Marcum et al., 2012; Moon et al., 2012; Longshore et al., 1996; Tittle et al., 2003). Moreover, more scholars have been inclined to study online deviance, but this topic is still underrepresented in criminological research utilizing international samples. To address these issues, this study conducted structural equation modeling (SEM) using Korean data. This study examined that parental management had an influence on online deviance, by mediating low self-control based on Gottfredson and Hirschi's (1990) self-control theory. In addition, this study examined supplementary models to discover whether gender differences would occur in this study. Through testing five hypotheses, this study found strong support for the self-control theory. Additionally, the results of this study were similar to previous studies related to online deviance, but there were several issues.

First of all, this study found that low self-control in all models of this study was the strongest predictor of deviant behaviors on the Internet by adolescents. As results from numerous empirical studies have shown (Pratt & Cullen, 2000), low self-control significantly increases adolescents' online deviance. That is, adolescents with low self-control are more likely to commit online deviance than those with high self-control like the results of prior studies (Donner et al., 2014; Higgins, 2005, 2006; Holt et al., 2012; Moon et al., 2012). Furthermore, results of this study were in line with several studies using Korean samples (Baek et al., 2016; Kim & Kim, 2015; Moon et al., 2010; Moon et al., 2012).

Secondly, the results from this study indicated that parental management did not have a direct impact on online deviance. Unlike findings of the meta-analysis (Hoeve et al., 2009), in which parenting is strongly linked to delinquencies, parental management did not significantly and directly decrease online deviance in all models of this study (Models 1 to 3). Instead of this relationship, parental management significantly increased the level of low self-control, and this low self-control led to online deviance. That is, consistent with propositions of Gottfredson and Hirschi's (1990) self-control theory, parental management influences deviant behaviors through their children's self-control (Gibbs et al., 1998; Gibbs et al., 2003).

However, although the results in Model 2 for female adolescents were consistent with Model 1 (parental management decreased online deviance through the mediation of self-control of female adolescents), parental management was not significantly related to low self-control in Model 3 for male adolescents. This issue might be linked to different parental attitudes about female and male children (Tittle et al., 2003). For instance, LaGrange and Silverman (1999) described differential socialization that "females tend to be more closely monitored than males throughout childhood. They therefore have fewer opportunities to express their propensities in antisocial actions, even if such propensities exist" (p. 44). Thus, their parents could more sensitively influence females' self-control than that of males (Tittle et al., 2003). Regarding different parental management for females and males, Higgins (2006) referred to this issue, mentioning that "while Gottfredson and Hirschi assert that the mechanism for criminal behavior is the same for males and females (i.e., low self-control), they are clear in their assertion that criminal behavior and self-control levels will be different for males and females" (p. 5).

Finally, this study showed several differences between Model 2 for females and Model 3 for males. In particular, this study found different effects to online deviance across gender in Table 7. According to the results, females' low self-control was a strong mediation between parental management and online deviance, while the role of parental management for male adolescents was weak in this study. This study could not strongly claim the existence of gender differences in parental management, low self-control, and online deviance because relatively few studies have examined this issue as well as found mixed results concerning low self-control when explaining gender differences (Higgins, 2006; Moon et al., 2012; LaGrange & Silverman, 1999; Tittle et al., 2003). However, this study recommends that gender differences should be included in the etiology of online deviance by adolescents due to gender that appears to be the significant factor to a variety of deviant behaviors (Higgins, 2006; Higgins et al., 2007; Hinduja 2008; Malin & Fowers, 2009; Moon et al., 2012; Morris & Higgins, 2009; Longshore et al., 1996). As Gottfredson and Hirschi (1990) suggested, "Gender differences may be due to differences in crime rather than criminality, and that differences in opportunity may account for much of the male-female differences in crime rates" (p. 147).

Conclusion

Although this study found that parental management, low self-control, and the mediation effect had a different influence on online deviance depending on gender, this study strongly supported the main assumption of Gottfredson and Hirschi's (1990) self-control theory that individuals with low self-control are more likely to engage in various types of deviant and criminal behaviors than those with high self-control. This study,

however, had several limitations, such as measurement issues, the cross-sectional nature of the data (e.g., unclear time-order), and the exclusion of concepts in the theory (e.g., opportunity). In particular, data that used in this study is rather old so that it could be controversial that the findings of current study are still applicable today. In addition, this study narrowly focused on computer-specific parenting based on computer use. Therefore, these measures would not represent all parental management in the self-control theory. Moreover, the measures could be applied to another concept in the theory. For instance, a measure used in this study, “My parents limit my time using computers, so I can use the computer allowed time period,” could be the concept of opportunity in this theory. In addition, there were only four measures for low self-control instead of six (impulsive, insensitive, physical, risking, short-sighted, and nonverbal). Finally, parental management of respondents could be generated by their online deviance. However, this study could not control this time-order due to cross-sectional data. Nevertheless, this study strongly supported Gottfredson and Hirschi (1990)’s theory. In addition, this study would contribute as an examination that applies self-control theory to Korean adolescents. Future studies are needed to clearly define measures and to determine the cause of gender difference in online deviance. These can, in turn, offer ways to aid in the investigation and remediation of this particular form of deviant behaviors on the Internet by adolescents.

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