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Do moral beliefs condition the impact of low self-control on digital piracy?

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Abstract

Morality and low self-control can both play critical roles in rule-breaking behaviors. Yet, our understanding of the interplay between morality and low self-control offers only a limited explanation of digital piracy. Using data from a sample of 1,091 South Korean students, we confirm that both morality and low self-control are important predictors of digital piracy. In addition, the current study reveals that morality conditions the relationship between low self-control and digital piracy. The results show that morality enhances the effects of low self-control on digital piracy. Overall, they thus confirm the importance of morality and low self-control as factors in digital piracy; however, they justify continued efforts to understand the interaction between morality and low self-control with respect to this type of crime.

Keywords: morality, low self-control, situational action theory, digital piracy, South Korea

Introduction

Gottfredson and Hirschi's (1990) low self-control theory has been widely examined and cited. The central argument of this theory is that people with low self-control are likely to engage in crime and analogous behaviors because they are less capable of thinking about the long-term consequences of their actions than those with high self-control. According to Gottfredson and Hirschi, while people tend to seek pleasure and avoid pain, those with low self-control are less able to resist the temptations associated with crime.

A wealth of research has used different samples and methodologies to show that low self-control is one of the strongest and most robust correlates of crime and deviance (e.g., Gibbs and Giever 1995; Grasmick, Tittle, Bursik, and Arneklev 1993; Paternoster and Brame 1998; Pratt 2016; Pratt and Cullen 2000; Reynolds, Woo, Lee, and Yoon 2018; Vazsonyi, Pickering, Junger, and Hessing 2001). A recent line of theoretical and empirical research has shown that the predictive power of self-control can be contingent on the various conditions under which self-control relates to crime (e.g., Burton, Evans, Cullen, Olivares, and Dunaway 1999; LaGrange and Silverman 1999; Meldrum, Young, and Weerman 2009; Nagin and Paternoster 1993), including the extent to which morality and self-control interact in predicting crime and analogous behaviors (e.g., Antonaccio and Tittle 2008). The research findings on whether self-control is more effective among individuals with high or low morality are mixed, however (e.g., Gallupe and Baron 2014; Svensson, Pauwels, and Weerman 2010). Several lines of thought posit that morality and self-control interact to explain deviant behaviors, whereas they disagree on specific predictions of the interplay between morality and self-control, thus resulting in diverging hypotheses.

First, some researchers argue that self-control is a relevant factor only among those with low moral beliefs (e.g., Wikström and Treiber 2007). Situational action theory (SAT) argues that potential offenders go through a two-stage perception choice process. In the first stage, an individual's perceived action alternatives "set the boundaries for the choice process" (Wikström, Oberwittler, Treiber, and Hardie 2012, p. 17). The individual then chooses whether to commit the crime. In other words, certain people consider crime to be an actionable alternative in certain settings. SAT suggests that most people do not see crime as an acceptable behavioral alternative.

Further, according to SAT, morality serves as an inhibitive filter to see criminal actions as unrealistic possibilities (see also Kroneberg, Heintze, and Mehlkop 2010; Messner 2012). The concept of morality is not completely absent from criminological frameworks. For example, in Akers's (2009) Social Learning Theory (SLT), morality is subsumed under one of the four key theoretical components, an individual's definitions of the particular behavior. Research has consistently shown that individuals who adhere to moral norms are less likely to commit delinquent acts or crime (e.g., Akers and Cochran 1985; Mears, Ploeger, and Warr 1998). Nonetheless, SLT is not explicit regarding the role of morality in relation to other variables, such as self-control. On the other hand, SAT clarifies the relationship between important theoretical constructs; it proposes that morality acts as a moderator influencing the relationship between self-control and delinquent behavior. SAT employs the concept of self-control reminiscent of Gottfredson and Hirschi (1990). However, Wikström (2006) stated that morality is a more fundamental factor in the causation of criminal activity because self-control comes into play only when individuals consider crime to be an actionable alternative. In short, SAT proposes that the role of self-control is insignificant when individuals possess strong moral beliefs because those

with strong morality do not see an act of crime as a possibility and self-control would thus not be exercised to restrain these individuals (Brauer and Tittle 2017)¹.

Second, other scholars hypothesize that self-control can enhance the impact of morality on crime and deviance (Tittle, Ward, and Grasmick 2004). People with high moral standards may be unable to regulate their behaviors if they have low self-control. On the contrary, individuals with low moral standards may commit crime or be deviant regardless of their self-control. In other words, self-control may be less (more) influential among individuals with low (high) morality (see also Antonaccio and Tittle 2008). Finally, some scholars contend that low self-control is a relevant factor for both those with high moral beliefs and those with low moral beliefs, although self-control has less effect on misbehavior among the latter (Schoepfer and Piquero 2006). This final hypothesis is different from SAT, which considers self-control to be irrelevant only for those with high moral standards.

Researchers have examined whether morality and self-control interact to predict misbehavior, with the results from a number of empirical studies that have tested this hypothesis yielding mixed conclusions. Some studies have failed to find an interaction between morality and self-control (Antonaccio and Tittle 2008; Gallupe and Baron 2014; Kroneberg and Schulz 2018). For example, using a sample of 30 street youth in Canada, Gallupe and Baron (2014) examined how self-control and morality interact to influence hard and soft drug use. Their findings did not support interactions between morality and self-control in explaining the probability of carrying out criminal acts. Data from a sample of adults in Ukraine also showed that the interaction between morality and self-control did not predict violence and property crime (Antonaccio and Tittle 2008). Interestingly, one significant interaction effect detected was consistent with the contentions of Tittle and colleagues (2004). Specifically, those with high morals were more

likely to be influenced by higher self-control than those with low morals. Another study also reported limited evidence that self-control inhibits offending among individuals with low morals since this finding was observed from cross-sectional data, but not longitudinal data (Bruinsma, Pauwels, Weerman, and Bernasco 2015). Finally, Kroneberg and Schulz (2018) found that when morality was high, self-control was weakly related to delinquency among adolescents in Germany, while students with low morality were not influenced by self-control at all.

Other studies support an interaction effect between morality and self-control, and the direction of this effect is congruent with Wikström's SAT model (e.g., Brauer and Tittle 2017; Hirtenlehner and Hardie 2016; Pauwels 2018; Svensson, Pauwels, and Weerman 2010; Tittle, Antonaccio, Botchkovar, and Kranidioti 2010; Wikström and Svensson 2010). For example, among young people in Belgium, Sweden, and the Netherlands, Svensson, Pauwels, and Weerman (2010) found that the impact of self-control was stronger for adolescents with low moral beliefs than those with high moral beliefs. Using data from the Peterborough Youth Survey, Wikström and Svensson (2010) provided additional support showing that self-control was significant only as a predictor among those with moderate or weak morality. They argued that the lack of a relationship between self-control and offending occurred because people with high morals did not see crime as a viable alternative. In addition, Brauer and Tittle (2017) found that associations between impulsivity and both past and projected violent criminal likelihoods were significant and positive only among those who contemplate aggressive, violent criminal action alternatives (see also Pauwels 2018 for more detailed dynamics of self-control, criminogenic exposure, and violence).

These and related studies have helped explain the interrelationships between morality and self-control and how they link to crime and deviance (Pauwels, Svensson, and Hirtenlehner

2018). Recently, researchers have investigated the extent to which self-control and morality interact to predict less conventional misbehaviors. For example, Pauwels and Svensson (2017) examined the interaction between self-control and extremist moral beliefs to explain political violence in a sample of young adults in Belgium, while Craig (2019) investigated this effect for white-collar crime. Furthermore, scholars have examined the international generalizability of the morality–self-control interaction in various countries (Antonaccio and Tittle 2008; Gallupe and Baron 2014; Hirtenlehner and Hardie 2016; Svensson, Pauwels, and Weerman 2010; Wikström and Svensson 2010), although most studies have been conducted in European and other Western nations (cf. Brauer and Tittle 2017).

The rising attention to the interplay between morality and self-control can be partly attributed to the formulation of SAT (Wikström 2004, 2006; Wikström, Oberwittler, Treiber, and Hardie 2012). Although not the first theory to assign importance to morality in criminology (Bachman, Paternoster, and Ward 1992; Paternoster and Simpson 1996; Piquero and Tibbetts 1996), SAT successfully situates morality at the forefront of understanding the causes of crime. It delineates the causal mechanism that underlies a criminal activity; morality acts as a perceptive filter that draws the boundaries to consider action alternatives. When an individual's morality is strong, he or she will not deliberate or contemplate a breach of the law regardless of his or her internal control (e.g., self-control) or external control (e.g., deterrence mechanisms). A growing empirical literature has thus evaluated the validity of Wikström's SAT (Antonaccio and Tittle 2008; Brauer and Tittle 2017; Cochran 2016; Piquero, Bouffard, Piquero, and Craig 2016; Svensson, Pauwels, and Weerman 2010).

Nonetheless, the interaction between morality and self-control in the setting of computer crime, specifically digital piracy, remains poorly understood (cf. Higgins and Wilson 2006).

Over recent decades, criminologists have paid attention to the problem of digital piracy, which is considered to be an important rule-breaking behavior that has become critical in contemporary society. Digital piracy can be defined as “the unauthorized use or illegal copying of a software product without permission and compensation to the copyright holder” (Hinduja 2008, p. 391). A discussion on the conditional effects of self-control could thus help explain digital piracy in the vein of criminological studies that provide insights into understanding computer crime (e.g., Burruss, Bossler, and Holt 2013; Holt and Bossler 2014; Morris and Higgins 2010; Skinner and Fream 1997).

Despite the paucity of empirical research on the interaction between morality and low self-control in the context of digital piracy, Higgins and Wilson (2006) were notable for exploring the conditioning effects of morality. Drawing on a sample of 318 college students, they examined whether moral beliefs condition the effects of the variables derived from self-control theory and social learning theory on intention to pirate digital movies. They found that the effect of low self-control was only significant among the low morality group, while no relationship was observed among the high morality group. However, a z-test for equality of regression coefficients indicated that the observed differences in the effect of low self-control on digital piracy were not statistically significant. Although this work provides an important first step, several data limitations prohibited the authors from drawing firmer conclusions, including the use of a convenience sample and lack of examining actual offending (i.e., digital piracy in practice). More importantly, the theoretical arguments on the conditioning effects of moral beliefs were unclear. Our study builds on and extends the existing research by exploring the extent to which the interrelationship between morality and low self-control can explain actual involvement in digital piracy.

Current Study

Although the field has only relatively recently begun to consider the moderating effects of moral beliefs on self-control, the findings thus far presented are inconsistent. Additionally, all but two previous investigations have focused on traditional delinquency or crime (e.g., shoplifting, drug use, vandalism, graffiti, threatening behavior, fighting outside school, and burglary), overlooking the analysis of whether morality may condition the impact of low self-control on digital piracy, which has become an increasingly urgent issue globally (RIAA 2015). Further, few studies assess the relationship between morality and low self-control in the East Asian context even though this topic is deserving of empirical scrutiny, especially given that South Korea suffers from widespread digital piracy compared with many other developed countries (Business Software Alliance 2018). In addition, teenagers in South Korea report extremely high levels of Internet usage according to the nationwide study conducted by the Korea Internet & Security Agency (2018). Exploring the interplay between morality and self-control in the context of digital piracy in South Korea, specifically among a large sample of imprisoned felons, therefore extends the body of previous research.

Based on Wikström's SAT, we hypothesize that morality serves as a significant predictor of digital piracy. Additionally, low self-control is hypothesized to predict digital piracy in accordance with the findings of prior research (e.g., Burruss, Bossler, and Holt 2013; Burruss, Holt, and Bossler 2019; Higgins, Fell, and Wilson 2006; Higgins and Makin 2004; Higgins, Marcum, Freiburger, and Ricketts 2012; Higgins and Wilson 2006; Lowry, Zhang, and Wu 2017). Finally, it is hypothesized that morality and low self-control interact to explain digital piracy; however, the specific direction of the conditioning effect of morality on the relationship

between low self-control and digital piracy is not designated since this line of inquiry has yielded conflicting findings (e.g., Brauer and Tittle 2017; Wikström and Svensson 2010). Hence,

H1: There is a significant and negative relationship between morality and digital piracy.

H2: There is a significant and positive relationship between low self-control and digital piracy.

H3: There is a significant interaction effect between morality and low self-control in predicting digital piracy.

Method

Survey, sample, and data

A sample of 1,091 juveniles (585 boys and 505 girls) were surveyed from August to September 2009 by the Korean Institute of Criminology as part of its law-related education program for the Elementary Education Act. The self-report survey instrument featured questions about students' awareness of cybercrime laws and involvement in online deviance. A cover letter signed by the Korean Institute of Criminology attached to the survey instrument explained the purpose of the study. An original questionnaire was designed in Korean to be administered to participating students in elementary and middle schools. The Korean version of the survey instruments was translated into English for analysis by bilingual researchers.

Stratified multistage cluster sampling was employed for the study. Geographic areas in Seoul, the capital city of Korea, were first stratified into four regional districts and then elementary schools and middle schools (Grades 5–7) were randomly selected in each region. For example, four elementary schools were chosen from the northeastern district of the Han River where 112,070 elementary students attended, whereas only two elementary schools were chosen from the southwestern district of the Han River where 53,911 elementary school students

attended. After selecting a sample of 12 elementary schools and 12 middle schools across the city, researchers randomly chose one class (about 25–30 students) of each grade from every school. Researchers visited the randomly selected classes in the sampled schools and administered the questionnaire to the whole class. The final sample size was 1,091. With regard to the demographic characteristics of those in the final sample, 32.2% of respondents were fifth graders, 32.1% sixth graders, and 35.7% seventh graders and the proportion of boys was 53.7%.

Measures

Digital piracy. The dependent variable is the subject's self-reported involvement in digital piracy. A single open-ended item was used to measure the frequency with which the respondent engaged in digital piracy over the past six months. Specifically, participants were asked whether they had ever intentionally downloaded copyrighted music, cartoons, movies, TV shows, or software files using the Internet without paying a fee. Students were asked when they had participated in digital piracy over the past six months and were instructed to write down the number of times in which they had engaged in this action. Table 1 provides more detailed information on the coding of the independent and dependent variables used in the analyses.

Morality. Our measure of morality includes three questions about the respondent's endorsement of unethical online behaviors involving digital piracy. The subject's moral acceptability of digital piracy was solicited based on a vignette. The scenario (see the Appendix) describes Minsu, a boy who downloaded copyrighted music files from peer-to-peer file-sharing websites and uploaded copyrighted music files onto his blog, which then resulted in Eunji downloading a music file. Participants were instructed to read the story and answer a series of survey questions associated with it. They were asked to rate their moral judgment of the three actions related to the story: (a) Minsu's behavior of downloading music files from peer-to-peer

file-sharing websites, Minsu's behavior of uploading music files onto his blog, and (c) Eunji's behavior of downloading music files from Minsu's blog. Each item was rated using a five-point Likert scale from 1 (certainly wrong) to 5 (certainly right). The three items were reverse coded, all of which loaded onto one overall factor, and had good internal reliability ($\alpha = .833$). In the analysis to follow, the morality variable is the sum score of these three items coded so that a higher score indicates a higher level of morality related to digital piracy. Overall, students reported relatively high morality (sum score of 12.32 out of 15).

Low self-control. Low self-control was created by summing four items indicating agreement with the following statements: (a) "I tend to do my job without a plan," (b) "I always act on a whim," (c) "I often behave impulsively," and (d) "I behave without thinking much about what will happen later" (see Baek, Nicholson, Higgins, and Losavio 2018). These items are comparable with some of the 24 widely used items developed by Grasmick, Tittle, Bursik, and Arneklev (1993). They measure several key elements of low self-control such as impulsivity, short-sightedness, and preference for non-verbal actions (Gottfredson and Hirschi 1990). For example, an item such as "I tend to do my job without a plan" measures the aspect of impulsivity, whereas "I behave without thinking much about what will happen later" measures the dimension of shortsightedness. Respondents answered on a five-point scale from 1 (strongly disagree) to 5 (strongly agree). The scale conformed well to a one-factor solution and its reliability was good ($\alpha = .812$). Low self-control is coded so that a higher score reflects lower self-control.

Differential association. There is empirical support for the existence of the relationship between differential association and online deviant behaviors, including identity theft, computer hacking, and digital piracy (e.g., Holt, Bossler, and May 2012; Marcum, Higgins, Ricketts, and

Wolfe 2015; Morris and Higgins 2010). To account for potential spuriousness, a measure that represents the influence of delinquent peers in virtual environments was used as a statistical control. Specifically, respondents were asked how many of their close friends have engaged in the following four unethical online behaviors: (1) posting abusive comments about others, (2) illegally downloading music or movie files, (3) engaging in theft of game items, and (4) attempting to sell game items or other products fraudulently to make money. An ordinal measure was used (1 = none, 2 = one, 3, = two to three, 4 = four to five, 5 = six and more).

The last series of measures dealt with the subject's demographic characteristics (e.g., age, and sex, family structure, and socioeconomic status).

Family structure. This measure was included to account for the effects of family structure on the development of self-control and morality (Antonaccio and Tittle 2008). Family structure was operationalized as "all other living arrangements" (0) as opposed to "living with both parents" (1).

Socio-economic status. The respondent's perceived socioeconomic status was used as a proxy of actual socio-economic status. Respondents were asked, "how well off do you think your family is?" Responses were measured on a five-point scale from not very well off (1) to very well off (5).

Age. The ages of respondents ranged from 10 to 14, with an average of 11.95 (SD = .88).

Sex. The sex of students was included as a control variable (male = 0, female = 1).

[Table 1 about here]

Analytic Strategy

We proceeded in three steps. First, we examined how low self-control and morality each influence the likelihood of digital piracy using negative binomial regression and explored

whether those relationships endure when the other control variables are included. Negative binomial regression was used because the dependent variable in this study, digital piracy, is an overdispersed count outcome variable. Second, we examined the extent to which morality conditions the relationship between low self-control and digital piracy likelihood using a split-sample procedure to determine whether the impact of low self-control is conditioned by the level of morality. Finally, a z-test for the equality of the regression coefficient (i.e., slope difference test) was used to determine whether the observed differences in the effect of low self-control on digital piracy are significant between the high morality and low morality subsamples.

Results

Model 1 in Table 2 is a baseline model containing the individual-level covariates of digital piracy (differential association, family structure, socio-economic status, age, and sex). Those who associate with deviant peers were more likely to engage in digital piracy ($b = .501, p < .001$). Those living with both parents reported lower digital delinquency involvement ($b = -.583, p < .001$). On the contrary, older students were more likely to engage in digital piracy than their younger peers ($b = .887, p < .001$). Females were more likely to engage in digital piracy compared to males ($b = .244, p < .01$). Model 2 shows that both low self-control and morality independently predict digital piracy likelihood independent of one another. Those with low self-control were more likely to engage in digital piracy ($b = .091, p < .001$), whereas moral beliefs were negatively and significantly related to digital piracy likelihood ($b = -.098, p < .001$). Model 3 examines whether these two significant effects maintain even after the other variables are controlled for in the model, and this is the case. Low self-control exhibited a similar positive relationship to digital piracy. Additionally, moral beliefs had a significant effect on digital piracy once the other control variables entered the model. Moral beliefs have crime-inhibiting effects on

digital piracy. All the other covariates (i.e., differential association, family structure, socioeconomic status, age, and sex) continued to predict digital piracy in Model 3.

[Table 2 about here]

Morality as a moderator

Lastly, we examined the interaction effects between low self-control and morality as they relate to digital piracy using a split-sample procedure (Table 3). The average score on the overall morality scale was 4.11 (SD = .85). Approximately 28.7% of the sample reported morality values above 5.00 (n = 312) and about one-third reported morality values below 3.67 (n = 357). To examine the possibility of the differential effects of low self-control between the high and low morality groups, respondents were split into two subsamples (above 5.00 = high morality, below 3.67 = low morality) based on these naturally occurring breaks in morality values.

The results in Table 3 indicate that among the 312 cases in the high morality group, low self-control exhibited a significant effect on digital piracy; on the contrary, among the low morality group, low self-control was not significantly related to digital piracy. A z-test for the equality of the regression coefficients (i.e., slope difference test) revealed that the relationship between low self-control and digital piracy in the high morality group was significantly different from the effect in the low morality subsample ($Z = 3.576$). Moreover, the effects of age differed among the high and low subsamples. Among the high morality group, age exhibited a stronger deterrent effect on digital piracy likelihood.

[Table 3 about here]

Discussion and Conclusion

One of the most recent interests of criminological research has centered on the interplay between morality and self-control in the explanation of rule-breaking behaviors (e.g., Antonaccio

and Tittle 2008; Svensson, Pauwels, and Weerman 2010; Wikström and Svensson 2010).

Although it is not entirely noble in the field of criminology to discuss the importance of considering morality with respect to rule-breaking behaviors (Messner 2012; Paternoster and Simpson 1996; Pogarsky 2002), Wikström's formulations of SAT contribute to more thorough examinations of personal morality (Wikström 2004, 2006; Wikström, Oberwittler, Treiber, and Hardie 2012). A growing empirical literature documenting the influence of morality on offending based on SAT also exists (Cochran 2016; Craig 2019; Gallupe and Baron 2014; Svensson, Pauwels, and Weerman 2010; Wikström, Oberwittler, Treiber, and Hardie 2012).

According to Wikström (2004), people have "a capability to act upon their environment in a purposeful way" and people's acts "are ultimately a consequence of how they see their options (react to the environment) and make their choices (judgments, deliberations)" (p. 6). In other words, all the actions humans take are the results of their perceived action alternatives. An individual's morality is an important reference to contemplate a potential course of action. People with high morality may not see a criminal activity as an alternative. This means that low self-control can be irrelevant for their course of action. On the contrary, those with low morality may consider an act of crime to be an alternative, but they need to decide whether to commit a crime. In that decision, low self-control may play a role in their contemplation of committing an act of crime. Put simply, SAT argues that low self-control is an important factor only among those with low moral beliefs.

On the contrary, some researchers have argued that low self-control can be more important for those with high morality, whereas individuals with low morality are less influenced by low self-control (Tittle, Ward, and Grasmick 2004). According to Tittle, Ward, and Grasmick (2004), while individuals with low morality are more likely to engage in rule-breaking behaviors

regardless of their level of self-control, individuals with high moral standards are less likely to offend if they have high self-control.

Empirical research examining diverging hypotheses has yielded conflicting results on the conditioning effect of morality on the relationship between low self-control and rule-breaking behaviors (e.g., Brauer and Tittle 2017; Svensson, Pauwels, and Weerman 2010). Indeed, evaluations of the extent to which an interaction exists between morality and low self-control in predicting digital piracy remain limited. Thus, this study examined whether morality and low self-control interact to explain digital piracy.

Our research, using data from a sample of adolescents in South Korea, yielded three key findings. First, consistent with SAT's propositions, it was hypothesized that morality has a significant and negative effect on digital piracy; this hypothesis was supported. Those with high moral standards were less likely to engage in digital piracy. This finding is congruent with previous research that has documented a negative relationship between morality and conventional rule-breaking behaviors (e.g., Bachman, Paternoster, and Ward 1992; Brauer and Tittle 2017; Kroneberg and Schulz 2018; Piquero, Bouffard, Piquero, and Craig 2016) as well as less conventional deviances (Craig 2019; Higgins and Wilson 2006; Pauwels and Svensson 2017).

Second, low self-control had a positive and significant relationship with digital piracy. In other words, those low in self-control were more likely to engage in digital piracy. Gottfredson and Hirschi (1990) argued that individuals offend to pursue the self-interest of pleasure and that low self-control is the central cause of rule-breaking behaviors. Digital piracy shares several attributes with traditional crimes. This type of computer crime is easy, simple, and immediately gratifying. Those with low self-control cannot resist the temptation of crime because they are

shortsighted, present-oriented, and impulsive. The evidence of the relationship between low self-control and digital piracy is consistent in different samples and different types of studies (Baek, Nicholson, Higgins, and Losavio 2018; Higgins, Fell, and Wilson 2006, 2007; Higgins and Makin 2004; Higgins, Marcum, Freiburger, and Ricketts 2012; Higgins, Wolfe, and Marcum 2008; Kim and Kim 2015).

Third, the current study's major interest was in the moderation between morality and low self-control. The results of the interaction effect tended to support the notion that low self-control is more relevant for those who report low moral standards, at least among this sample of adolescents in South Korea and when using this measure of morality. While this pattern of results conflicts with the arguments of SAT (Svensson, Pauwels, and Weerman 2010; Wikström and Svensson 2010), it is in line with the suggestions provided by Tittle, Ward, and Grasmick (2004), who proposed that self-control can intensify the effects of morality on criminal/deviant behaviors. According to their logic, even if an individual possesses a high moral standard, if he or she has a low level of self-control, he or she will be unable to resist his or her temptations to misbehave. On the contrary, an individual with a low moral standard will commit crime regardless of his or her level of self-control. In short, low self-control is more influential among individuals with high morality and less influential among those with low morality (see also Antonaccio and Tittle 2008).

However, many studies have supported the argument of SAT that self-control is more potent among those with lower morality; yet, because limited research has applied SAT to digital piracy, it is important for future studies to clarify how morality conditions self-control depending on the types of rule-breaking behaviors. Our results suggest that among adolescents in South Korea, higher morality may make low self-control more potent; however, for different types of

offending, the contention of SAT may serve as a better predictor. The current study thus highlights the importance of continued efforts to understand the interplay between morality and self-control.

If additional studies were to replicate the findings of the present work, it would be critical for criminal justice policies to incorporate educational programs to inculcate moral beliefs involving unauthorized downloading and file sharing. There is some evidence that such programs are effective at fostering moral beliefs and empathy (see Eisenberg, Eggum, and Di Giunta 2010). For instance, the Child Development Project, an intervention program designed to develop prosocial behavior in schools, demonstrates that a child-centered approach encouraging students to participate in rule setting and engage in prosocial activities can instill moral beliefs and empathy toward other people (Eisenberg, Fabes, and Spinrad 2006). Attempts to promote moral reasoning among adolescents can prevent involvement in digital piracy not only by helping students understand what is right and wrong when deciding whether to use copyrighted digital software illegitimately but also by making internal control mechanisms more effective.

The results of the current study should be read in accordance with certain limitations. First, we used cross-sectional data, which does not permit a strong temporal order. Subsequent studies could adopt longitudinal data to measure morality at a point in time and digital piracy in the future. Longitudinal studies should also devote special attention toward measuring moral beliefs. Considering that such beliefs can be situationally dependent according to SAT, the measure should be directly related to rule-breaking behavior and capture an individual's perception immediately before committing such behavior.

Second, the use of an international sample limits the generalizability of the findings. Although it is critical to apply the empirical validity of the findings of prior research to a new

setting, given that so little research on the interaction between moral beliefs and self-control has been conducted, continued efforts should be made to clarify the moderation between morality and low self-control. It remains unclear whether the conditioning effects of morality on rule-breaking behaviors vary depending on the population. For instance, the findings observed from Western nations may not be replicated with data from East Asia. Relatedly, although the current study sought to understand the interaction between morality and self-control to explain digital piracy, computer crime encompasses a wide range of offenses (e.g., cyber-trespass, cyber-porn and obscenity, and cyberviolence). Future research should thus be conducted to assess whether morality moderates the relationship between self-control and other technology-enabled crimes.

Finally, SAT suggests that social systemic factors such as sex, socio-economic status, and family structure are “causes of the causes” and that their effects are largely indirect through self-control and morality (Wikström, Oberwittler, Treiber, and Hardie 2012). However, our study showed that even in the model that includes morality and self-control, the impacts of family structure and socio-economic status were statistically significant. This result may stem from the fact that the analysis did not include an important component proposed by SAT: exposure to criminogenic settings. Further research should thus delve into the role of the causes of the causes in relation to morality, self-control, and criminogenic settings.

Nonetheless, our research highlighted the importance of moral beliefs and low self-control in explaining digital piracy. Additionally, the current study revealed an interesting interaction between morality and low self-control. Studies like ours and future ones are critical for criminologists and policymakers to better understand the mechanisms associated with digital piracy to develop theoretical frameworks and prevention/intervention programs based on empirical evidence.

Notes

1. On a side note, it deserves mentioning that morality has long been of interest to researchers in psychology. Psychologists contend that moral identity can be regarded as the cognitive schema an individual holds about his/her moral characteristics (Aquino, Freeman, Reed, Lim, and Felps 2009). Evidence shows that individuals with a strong moral identity are motivated to avoid engaging in antisocial or criminal behaviors to maintain their sense of identity (e.g., Hardy and Carlo 2011; Hardy, Walker, Olsen, Woodbury, and Hickman 2014; Kavussanu, Stanger, and Ring 2015). Some researchers contend that individuals who view that their morality is central and salient to their identity are less likely to engage in antisocial behaviors because they feel the sense of responsibility to act consistently with their moral beliefs and values (Hardy and Carlo 2011). In sum, a growing empirical literature illuminates the role of moral factors in individuals' behavioral patterns, suggesting that morality should be the subject of research on deviant behavior to expand our knowledge base in understanding rule-breaking decisions.

Appendix

[Situation] Minsu's listening to music on the Internet

Minsu learned about a P2P site while surfing the web. On P2P sites, there are various files such as the latest music, movies, cartoons, and programs that people can listen to or watch comfortably at home. Although people need to pay for these files, they are using them without payment. Minsu uploaded the music files to his blog to share music with his friend, Eunji. She downloaded the music from his blog and listened to the music, even though she knew the music file came from an illegal website.

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Table 1.

Descriptive statistics for dependent and independent variables used in the analysis.

Variable	Coding	M	SD
Low Self-Control	(1) Strongly Disagree, (2) Disagree, (3) Neutral, (4) Agree, (5) Strongly Agree (indicates lowest self-control)	2.44	0.88
Morality	(1) Very Bad, (2) Bad, (3) Neutral, (4) Good, (5) Very Good (reverse coded; indicates highest morality)	4.11	0.85
Differential Association	(1) None, (2) One, (3) Two to Three, (4) Four to Five, (5) Six and More	1.41	0.91
Family Structure	0 = all other living arrangements (8.63%) 1 = living with both parents (91.37%)		
Socio-economic status	1 = not well of at all, 2 = not very well off, 3 = average, 4 = quite well off, 5 = very well off	3.40	0.71
Age	Agee is truncated to whole numbers Range = 10 – 14	11.95	0.88
Sex	Sex coded as: Male = 0 (53.7%), Female = 1 (46.3%)		
Digital Piracy	The number of times downloading copyrighted music, cartoon, movie, TV show, or software files using the Internet without paying a fee	5.95	33.12

Table 2.
Negative binomial regression predicting digital piracy for combined sample (n = 1,014).

Variables	Model 1		Model 2		Model 3	
	b (SE)	IRR	b (SE)	IRR	b (SE)	IRR
Low self-control	—	—	.091*** (.010)	1.095	.063*** (.010)	1.065
Morality	—	—	-.098*** (.012)	.907	-.118*** (.013)	.889
Differential association	.501*** (.040)	1.650	—	—	.508*** (.041)	1.662
Family structure	-.583*** (.129)	.558	—	—	-.464*** (.133)	.629
Socio-economic status	.122* (.058)	1.130	—	—	.273*** (.062)	1.314
Age	.887*** (.046)	2.429	—	—	.922*** (.047)	2.514
Female	.244** (.080)	1.276	—	—	.227** (.082)	1.255
Model χ^2	650.265***		163.661***		785.100***	

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3.

Negative binomial regression predicting digital piracy for subsamples of low versus high morality values.

Variables	Low morality group (n = 357)		High morality group (n = 312)		z-score
	b (SE)	IRR	b (SE)	IRR	
Low self-control	.016 (.023)	1.016	.125*** (.020)	1.134	3.576***
Differential association	.356 (.064)	1.427	.517*** (.100)	1.678	1.356
Family structure	-.344 (.213)	.709	-.931** (.296)	.394	1.609
Socio-economic status	.074 (.100)	1.077	-.057 (.129)	.945	.802
Age	.479*** (.091)	1.615	.803*** (.092)	2.233	2.503***
Female	.319 (.136)	1.376	.447** (.159)	1.563	0.612
Model χ^2	65.615***		312.560***		

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.