

# THE EFFECT OF ONLINE PIRACY DETERRENCE ON SELF-CONTROL AND PIRACY INTENTION

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## Abstract

*As the internet is largely used worldwide, it becomes critical to protect digital contents on the internet from illegal piracy. The purpose of this study is to explore the effect of online piracy deterrence methods - punishment and education – on self-control and piracy intention. The gender differences on the relationship of piracy deterrence and intention is also examined. The result of this study shows that both piracy education and punishment have a strong relationship with self-control, and piracy education shows a stronger effect on self-control than piracy punishment. The study also reveals the gender differences in self-control and piracy intention toward piracy deterrence. This research would propose practical guidelines for policy makers and educator to reduce online piracy.*

*Keywords: Online piracy, Deterrence methods, Self-control, Piracy intention.*

# **1 INTRODUCTION**

As the Internet is widely used worldwide, digital asset on the internet becomes to be critical to protect from illegal copying and piracy. Online piracy is an unlawful action that download or upload copyrighted materials such as written materials, music, movies and software from the Internet without having a right to use them from the copyright owners (Higgins et al. 2006). The form of digital piracy varies from downloading single song, copying pieces of pictures to grabbing entire catalogues of an artist. Such an illegal and unethical behavior are pervading and becoming a big concern in many industries and business sectors over the world. Internet users tend to pirate online materials because it is easy to access and download to use and most online materials are free of use or cost only small amount of money. Moreover, a serious concern for online users on piracy is that most online users think piracy is harmless and pirate digital materials guiltlessly (Kini et al. 2003; Choi & Kim 2009). 70% of online users were reported that they perceive nothing wrong and harmless in online piracy (Infographic, 2011), which means that the internet makes users easily commit criminal activity without recognizing their illegal behaviors.

The proper education and training program for online piracy to develop ethical and moral behavior are still insufficient in most of institutions and organizations while the sanction and punishment are intensified in the way to prevent illegal behavior on the internet. However, researchers argued that anti-piracy regulation and sanctions are not the only solution to prevent digital piracy. Ethical training and education have to be also in practice with proper punishment and regulation to reduce piracy behavior and intention (Cheng et al. 1997).

According to deterrence theory, punishment and ethics training are two common methods to deter illegal and unethical behaviours. Punishment relies on person's fear of getting caught while ethics training is based on self-control and conscience. Yet, such anti-piracy measurements have not had a clear effect to reduce pirates and illegal behaviours on the internet. The effect of ethical training and punishment on piracy behaviour has shown to be adverse according to the social factors and individual characteristics (Workman & Gathegl, 2007). There are a number of studies examining the underlying motivations of online piracy, but a little research explores the effect of deterrent methods of online piracy such as education and punishment. Therefore, the purpose of this study is to explore the effect of two common methods of deterrents, piracy punishment and piracy education, on self-control and intention regarding online piracy. This study also examines the gender differences of the relationship between piracy education and punishment on piracy intention. The result of this study would propose a practical guideline for policy makers and educator to reduce the propensity of online piracy.

## **2 HYPOTHESIS DEVELOPMENT**

### **2.1 Piracy Education**

Environmental conditions such as education on online piracy could affect the actual behavior. Piracy education refers the degree of efforts in schools and educational institutions to prevent digital piracy on the Internet (Limayern et al. 2004). Crotty (2012) argued that the piracy education can be the best tool to deter online piracy and awareness and advertising on piracy have to be the first step against online piracy. Piracy behavior is influenced not only by formal education from institutions but also by socially interacting group of people in schools or institutions. That is, individuals who socially learned piracy are likely to commit piracy on the internet (Higgins & Makin 2004). The research on software piracy with self-control theory showed that moral beliefs and understanding toward software piracy provide a great impact on self-control and behavior on software piracy (Higgins 2005). In short, online

users tend to pirate when they feel free from moral beliefs and believe that no one is being harmed by their illegal behaviors. This shows that piracy education and moral training are important measures in increasing self-control and inhibiting piracy behavior on the internet.

*H1-1: Piracy education is positively associated with the self- control for online piracy.*

*H1-2: Piracy education is negatively associated with the behavioural intention on piracy.*

## **2.2 Piracy Punishment**

Piracy punishment refers to the degree of punishment certainty and severity regarding to online piracy (Peace et al. 2003). The level of certainty refers to the individual's belief that the act will be detected, and the level of severity refers to the individual's belief that the act will be punished severely (Choi and Kim 2009). The level of certainty is often considered to be playing more apparent role to prevent criminal behavior than the level of severity. Pogarsky (2002) suggested that forbidden factors such as swiftness, severity and certainty of punishments are significantly related to criminal behaviours and deterrent effects. In other words, the level of piracy attitude could decrease when people perceive certainty of punishment. Choi and Kim (2009) revealed in their study on the relationship between punishment and online piracy that the greater the certainty and severity of punishment, the higher the effectiveness on negative attitude on digital piracy. In addition, Sinha and Mandel (2008) examined that the perceived risk and punishment on illegal music download is significantly associated with the attitude of digital music piracy. Therefore, the punishment of online piracy is related to users' self-control on their piracy behavior and intention.

*H2-1: The degree of punishment on online piracy is positively associated with self- control on piracy.*

*H2-2: The degree of punishment on online piracy is negatively associated with the behavioral intention on piracy.*

## **2.3 Self-Control and Piracy Intention**

Self-control theory of crime originally developed by Hirschi and Gottfredson (1990) suggested that the individual's low self-control is the most important factor behind criminal behavior. It is often viewed as the range of potential cost knowing that crime can result of low-self control (Hirschi 2004). Self-control theory has been used to gain an understanding of online piracy by many researchers (Higgins et.al, 2006; 2008; Piquero & Bouffard 2007). Grasmick et al.(1993) condensed that individuals who have characteristics of low-self control tend to believe piracy is harmless and Higgins et al. (2006) supported the argument that a person with low self-control is likely to commit software piracy.

In this study, self control is defined as an individual's perception of possessing ability to control digital piracy (Cronan & Al-Rafee 2005) and piracy intention refers to the degree of individual's intention to commit digital piracy on the Internet (Peace et al. 2003).

*H3: The self- control for digital piracy is negatively associated with the behavioral intention on piracy.*

## **2.4 Gender Differences**

According to the gender socialization theory, moral reasoning of gender is different because male and females are meant to have different roles in society. Even though the gender issue still remains contentious, it is found that females are likely to include environmental cues such as cultural and social norm while men are more driven by attitude and intentions (Detert et.al. 2008; Stedham et al., 2007). Sims et. al.(1996) studied the different moral perception on piracy by gender and suggested that males are more willing to acquire and use pirated software than female. Simpson et.al.(1994) found that the propensity to pirate software is significantly different by gender showing males are more

likely to pirate software than females. In the study of socialization and software piracy by Moores and Esichaikul (2010), the level of buying pirated software is greater in male group than the female while the female group is likely to share the file when a pirated software is acquired. Therefore, the perceived impact of piracy education and punishment on individual's self-control and intention would be different by female and male.

*H4: The effect of piracy education and punishment on self-control and intention is different by gender.*

### 3 RESEARCH METHOD AND RESULT

#### 3.1 Research Methodology

To examine the relation between each variable, a survey instrument was given to undergraduate and graduate students taking MIS related courses such as management information systems, electronic commerce and business & computer. Students are known to be a prominent source of digital piracy since they may be the most active users on Internet (Sims et al. 1996). Each survey question was drawn from the previous studies and measured as 7 Likert-scales.

The 241 samples were used for the analysis out of 257 student samples after excluding biased and missing data. <Table 1> shows the characteristics of respondents. In the result of one-way ANOVA analysis for each characteristics, the duration of internet usage is shown to have no difference on behavioral control and piracy intention but the Internet ability is significant differences on behavioral control ( $p < 0.01$ ). It represents that those who have an ability to use Internet may perceive that they have ability in performing digital piracy. Gender is shown to be significant differences on behavioral control ( $p = 0.001$ ) and piracy intention ( $p = 0.000$ ). That is, the effects of piracy education and punishment on behavioral control and piracy intention might be different by gender.

Characteristics		Frequency	%
Gender	Male	126	52.3
	Female	115	47.7
Internet ability	Excellence	103	41.8
	Moderate	117	48.5
	Poor	21	8.7
Duration of Internet Usage	Less than 1hr.	24	10
	1-3hrs	162	67.2
	4-6hrs.	45	18.7
	More than 7hrs	10	4.1
		241	100

*Table 1. Characteristics of response*

#### 3.2 Data Analysis and Result

Prior to the path analysis, the validity of each survey items, internal consistency, individual item reliability and discriminate validity were tested using smart PLS 2.0. Since each measurement items used in this research reflects the corresponding construct and has high correlation among them, all the measurement items were analyzed with reflective indicators (Wixom and Watson 2001).

<Table 2> shows the individual item reliability by testing loadings and cross-loadings of each measurement items. It is suggested that the loading value of each items for a corresponding construct should exceed 0.7 or above and the value of cross loading for other items should be lower than the loading value of the item (Chin 1998). As shown in <Table 2>, each item on its respective constructs has the loading value greater than 0.7 and the cross loading values for other itmes are less than the loading values of a correlated construct.

	Piracy education	Punishment	Self-Control	Intention
edu1	<b>0.749</b>	0.099	0.237	0.127
edu2	<b>0.853</b>	0.058	0.176	0.061
edu3	<b>0.849</b>	-0.032	0.272	0.134
Punish1	-0.003	<b>0.828</b>	0.163	0.167
Punish2	0.078	<b>0.829</b>	0.104	0.210
SelfCont1	0.173	0.232	<b>0.781</b>	0.604
SelfCont2	0.348	0.008	<b>0.720</b>	0.360
SelfCont3	0.162	0.058	<b>0.801</b>	0.476
SelfCont4	0.247	0.158	<b>0.812</b>	0.489
intention1	0.129	0.182	0.613	<b>0.955</b>
intention2	0.137	0.253	0.592	<b>0.954</b>

Table 2. Factor loading and cross factor lading of measures

Internal consistency was examined by using CSRI (Composite Scale Reliability index), which is similar to Cronbach's alpha and above 0.7 is recommended for reliability (Chin 1998). As shown in <Table 3>, all measures meet the recommended criterion of above 0.7, and thus are to be reliable. Discriminant validity was tested by the square root of the average variance extracted (AVE), the diagonal values shown in <Table 3>. It is recommended that the square root of the AVE for each construct should be greater than other variance shared between a construct and its measures (Fornell & Larcker 1981). As shown in the <Table 3>, the all measures satisfy the common criterion for a validity test.

	No. Items	Internal Consistency	Correlation of Constructs			
			1	2	3	4
1. Piracy Education	3	0.86	0.82			
2. Piracy Punishment	2	0.81	0.04	0.83		
3. Self-Control	4	0.86	0.29	0.16	0.78	
4.Piracy Intention	2	0.95	0.14	0.22	0.63	0.95

Table 3. Test for reliability and validity

Based on the adequate measurement model, the proposed hypotheses are tested by assessing the structural model. Both full sample model and each model by gender are tested separately in order to examine the moderating effects of gender within the model. The result of analysis for full sample

model is shown in <Table 4>. Structural Equation Model analysis using Smart PLS2.0 is conducted. The structural model from PLS analyzes the strengths of the relationships between the variables and the predictive power of variables in a model. <Figure 1> shows of the result of full sample model of analysis. The result shows that the piracy education is significantly associated with self-control ( $t=4.43$ ,  $p=0.00$ ), but is not directly associated with piracy intention ( $t=0.67$ ,  $p=0.25$ ). The degree of piracy punishment, on the other hands, shows a significant relationship with both behavioral control and piracy intention with the level of  $p<0.05$ . The result also shows that behavioral self-control is strongly associated with piracy intention ( $t=-13.46$ ,  $p=0.00$ ). The negative effect of self-control on piracy intention implies that a person with higher level of self-control shows lower degree of intention to pirate.

To test the moderating effects of gender within the model, data was divided by gender and conducted path analysis of each gender model (refer to Figure 2). In female group ( $n=115$ ), piracy education has a strong relationship with behavioral control and piracy intention with  $p<0.01$  ( $t=5.418$ ,  $p=0.000$ ) and  $p<0.05$  ( $t=-2.004$ ,  $p=0.023$ ) respectively. Piracy punishment is also strongly related to behavioral control ( $t=5.994$ ,  $p=0.000$ ) but not directly related to piracy intention ( $t=1.583$ ,  $p=0.057$ ). This result shows that educational methods could better appropriate to control and inhibit piracy for female group. Contrary to the result of female group, piracy punishment is not significantly related to behavioral control ( $t=0.942$ ,  $p=0.174$ ) while directly related to piracy intention ( $t=-5.162$ ,  $p=0.000$ ) in male group. Moreover, piracy education is significantly associated with behavioral control ( $t=4.292$ ,  $p=0.000$ ) but not associated with piracy intention directly ( $t=0.248$ ,  $p=0.402$ ). The relationship between behavioral control and piracy intention shows a significant relationship in both groups. It shows that females are likely to prohibit piracy act by their self-control ability developed from education and punishment. In the case of male group, piracy education effects on behavioral control but punishment directly affect to piracy act regardless of their self-control ability. This result indicates that the level and policy of piracy education and punishment should be applied differently by gender to provide an effective protection for digital piracy.

Hypothesis	From	To	Path Coefficient	t-value	R <sup>2</sup>
H1-1	Piracy education	Self control	0.285	4.438**	0.108
H1-2	Piracy education	Piracy Intention	0.025	0.667	0.230
H2-1	Piracy punishment	Self control	0.149	2.28*	0.108
H2-2	Piracy punishment	Piracy Intention	0.218	1.911*	0.230
H3	Self control	Piracy Intention	-0.385	13.459**	0.230

\*  $p<0.05$ , \*\*  $p<0.01$

Table 4. Test of hypothesis (full sample model)

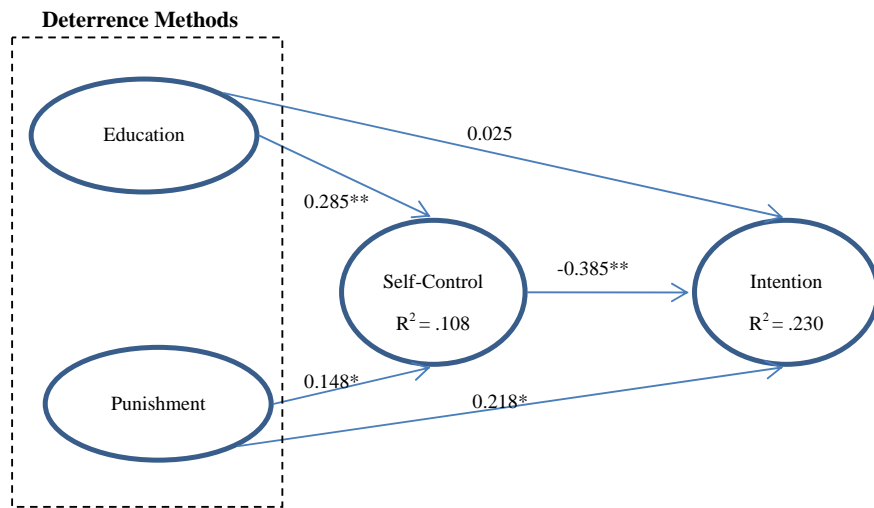
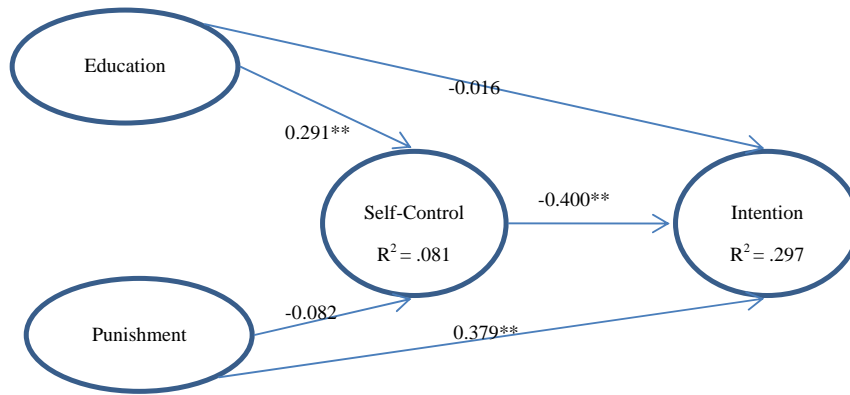


Figure 1. The structural model test (full sample model)

**Male (n=126)**



**Female (n=115)**

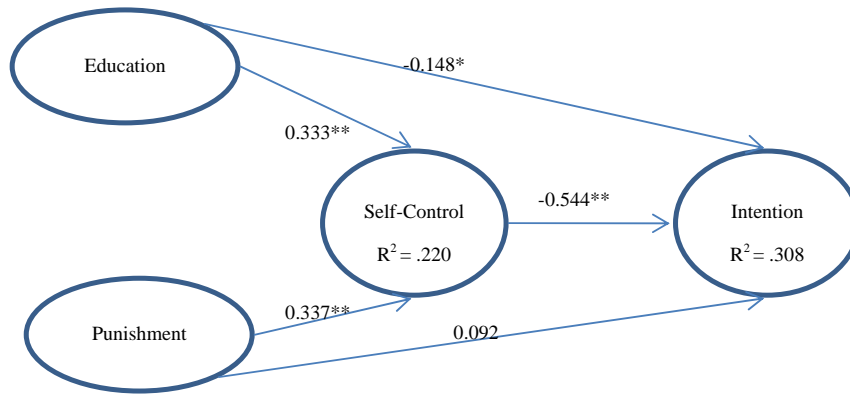


Figure 2. The structural model test by gender

## 4 CONCLUSION AND LIMITATION

As the usage of Internet has increased, online piracy has become a great concern for many managers and scholars. Online piracy could hinder firm performance and slow economic growth as a whole. The number of researches has attempted to find factors effect on piracy behaviour. However, the studies on the underlying effect of online piracy such as self-control and deterrent method are not yet to be explored. This study examined two common methods, piracy education and punishment, for deterring online piracy to see its differential effect on individual's self-control and piracy intention. The gender differences of the effects on deterrence methods were also investigated.

This study revealed that both piracy education and punishment have an impact on self-control for online piracy. Among deterrence methods, piracy education showed a stonger effect on self-control than piracy punishment. This result suggested that providing an ethical training and education for online piracy could enhance users' self-control, and thus refrain from piracy behavior and intention. This study also showed that males are more likely to pirate online materials than females. This implies



that males tend to feel online piracy guiltless and not to care of a harmful effect of online piracy while females are measured higher in self-control driven by environmental cues such as piracy education and punishment than males (Moore & Esichaikul 2011; Chapple et al. 2010).

It is arguable that most students tend to learn only the functional usage of internet and seldom have a chance to learn ethical use of materials on the internet. Such insufficient ethical training and education often result in the low self-control that has a strong correlation with online piracy (Higgins et al., 2004). Thus, a fundamental shift in user's perception toward piracy is needed to prevent online piracy. In doing so, proper ethical training and education has to consider in public and private sectors. In addition, policy makers should consider a strict and rigorous regulation on digital piracy so that people get aware of severe punishment in consequence of piracy behaviour. This study suggests to IT administrators and educators that developing ethic and moral principles are required to reduce the digital piracy. The result of this study could give a practical guideline to policy makers and educator to deter piracy behavior on internet.

This study has a number of limitations and suggestions for future research. Demographic differences such as age, gender, and origin of country may be examined in the context of piracy-ethical relationship. The effect of piracy can be varied by countries because of the differences of cost, legal, education and culture. For example, media piracy seems to be more common in the developing country than the developed country. Samples of various industries are also need to examine to reduce bias from the result. In the future research, it would be interesting to consider possible adverse effects of punishment severity and certainty on piracy.

## References

- Chapple, C.L., Vaske, J., & Hope, T.L. (2010), Sex differences in the causes of self-control: An examination of mediation, moderation, and gendered etiologies, *Journal of Criminal Justice*, 38, 1122-1131.
- Cheng, H.K., Sims, R.R., & Teegen, H. (1997), To purchase or to pirate software: an empirical study, *Journal of management information systems*, 13(4), 49-60.
- Choi, U.J., & Kim, G.Y. (2009), The study of an effect of punishment on online piracy intention, *Copyright*, June, 25-48.
- Chin, W.W., (1998). The partial least squares approach to structural equation modeling. *Modern Methods for Business Research*, 295-336.
- Crotty, J.M., (2012). Education is best weapon against web piracy, not SOPA, *Forbes*, Jan.31.
- Fornell, C. and Larcker, D. (1981). evaluating structural equation models with unobservable variables and measurement error, *Journal of Marketing Research*, 18(3), 39-50.
- Gottfredson, M.R., & Travis H. (1990), *A General Theory of Crime*, Stanford, CA, Stanford University Press.
- Grasmick, H.G. Tittle, C.R. Bursik Jr. R.J. and 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, 5-29.
- Higgins, G.E. (2005). Can low self-control help with the understanding of the software piracy problem?, *Deviant Behavior*, 26, 1-24.
- Higgins, G.E. and Makin, D.A. (2004). Does social learning theory condition the effects of low self-control on college students' software piracy? *Journal of Economic Crime Management*, 2, 1-22.
- Higgins, G.E., and Marcum, C.D. (2008). Digital piracy: An examination of three measurements of self-control, *Deviant Behavior*, 29, 440-460.
- Higgins, G.E. Brian D.F. and Abby, L.W. (2006). Digital Piracy: Assessing the Contributions of an Integrated Self-Control Theory and Social Learning Theory, *Criminal Justice Studies: A Critical Journal of Crime, Law and Society*, 19(1), 3-22.

- Hirschi, T. and Gottfredson, M.R. (1990). A general theory of crime, Stanford, CA, Stanford University Press.
- Inforgraphic (2011). Online Piracy in Numbers – Facts and Statistics, [www.Go-Gulf.com](http://www.Go-Gulf.com), 01. Nov.
- Kini, R.B. Ramakrishana, H.V. and Vijayaraman, B.S. (2003). An Exploratory study of moral intensity regarding software piracy of students in Thailand, Behaviour and Information Technology, 22, 63-70.
- Moore, T. and Esichaikul, V. (2011). Socialization and software piracy, Journal of Computer Information Systems, spring, 1-9.
- Peace, A.G. Galletta, D.F. and Thong, J.Y.L. (2003). Software Piracy in the Workplace: A Model and Empirical Test, Journal of Management Information Systems, 20(1), 153-177.
- Piquero, A.R. and Bouffard, J. (2007). Something Old, Something New: A Preliminary Investigation of Hirschi's Redefined Self-Control, Justice Quarterly, 24, 1-27.
- Pogarsky, G. (2002). Identifying Deterrable offenders: Implications for deterrence research, Justice Quarterly, 19, 431-452.
- Simpson, P.M. Banerjee, D. and Simpson, C.L. (1994). Softlifting: A Model of Motivating Factors, Journal of Business Ethics, 13(6), 431-438.
- Sims, R.L. Cheng, H. and Teegan, H. (1996) Toward a Profile of Student Software Pirates, Journal of Business Ethics, 15(8), 89-849.
- Sinha, R. and Manel, N. (2008). Preventing Digital Piracy: The Carrot or the Stick?, Journal of Marketing, 72(Jan).
- Stedham, Y. Yamamura, J.H. and Beekun, R.I. (2007). Gender Differences in Business Ethics: Justice and Relativist Perspectives, Business Ethics: A European Review, 16(2), 163-174.
- Workman, M. and Gathegl, J. (2007). Punishment and Ethics Deterrents: A Study of Insider Security Contravention. Journal of the American Society for Information Science and Technology, 58(2), 212-222.
- Wixom, B.H. and Watson, H.J. (2001). An empirical investigation of the factors affecting data warehousing success, MIS Quarterly, 25(1), 17-4.