SOCIALIZATION AND SOFTWARE PIRACY: A STUDY

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ABSTRACT

We examine the role of age, gender, and work experience on the propensity to buy, share, and use pirated software. These demographics are key properties of the cognitive-developmental, gender socialization, and occupational socialization theories. We find the overall level of reported buying is low, while the level of sharing and use is high. From the perspective of socialization, we find differences in levels of buying based on gender, differences in levels of sharing based on age and gender, and differences in levels of use based on years of work experience. This suggests the source of pirated software has shifted from buying to a diffusion network that involves sharing within certain social groups. The higher rate of use for those with more years of work experience reinforces a continual problem for software vendors: The inability of customers to pay for software that is deemed necessary to conduct business.

Keywords: Cognitive developmental approach, Gender socialization theory, Intellectual property rights, Occupational socialization theory, Software piracy.

1. INTRODUCTION

The U.S. Immigration and Customs Enforcement (ICE) agency reports that global counterfeiting and piracy is estimated to cost the U.S. economy $200-$250 billion a year, with the subsequent loss of some 750,000 jobs [47]. A range of products are subject to counterfeiting and piracy, including prescription drugs, designer clothing, and electronic equipment. The ease of copying electronic media makes software, music, and movies particularly vulnerable. The Institute for Policy Innovation (IPI) estimates that global music piracy costs the U.S. economy $12.5 billion [43], while the Motion Picture Association of America (MPAA) estimates that $18 billion is lost each year due to global movie piracy [28].

These losses combined, however, are less than the estimated losses due to software piracy, with the Business Software Alliance (BSA) estimating that $51.4 billion in pirated software was in use around the world in 2009 [5]. Large countries with emerging economies, such as Brazil, Russia, India, and China tend to be the most prevalent offenders, with these four countries accounting for $14.5 billion in lost sales. The large sum of money associated with software piracy underlines the importance of software to support and drive businesses around the world.

The U.S. government and software vendors have often tackled the problem of software piracy by emphasizing the legal implications of failing to protect intellectual property rights. Countries that do not do enough are listed on the U.S. Trade Representative’s Special 301 Report, which outlines violations and calls for monitoring and/or trade sanctions. Eleven countries, including China, Russia and India, were listed on the priority watch list in 2010[48]. This approach may have had some initial success, with the overall rates of software piracy declining sharply from 1994 to 1999. Since that time, however, the level of software piracy has remained steady and has recently shown signs of increasing [5]. So what can we do now?

This paper seeks to make two significant contributions: firstly, an analysis of piracy behavior in terms of buying, sharing, and using; and secondly, providing an assessment of whether one or more theories of socialization can suggest ways of reducing the level of piracy behavior. We argue that understanding the propensity to engage in software piracy requires an understanding of the socio-behavioral network in which the act takes place. In particular, we argue that while closing down shops and online stores that sell pirated software may restrict the supply, high levels of use may continue if people share copies amongst their in-group. This might also suggest that buying pirated software is no longer the key antecedent to use, and that one’s social group can determine the levels of use more than one’s ability to find shops and online stores selling pirated software. One’s social group may also supply the moral justification for engaging in something that is illegal. By addressing the role of socialization, anti-piracy campaigns may be developed that are more sensitive to the moral drivers that may be maintaining current levels of software piracy.

We explore these socio-behavioral aspects of software piracy by developing a model of ethical decision-making based on the socialization of the individual. We consider three theoretical perspectives: The cognitive-developmental approach suggests people become more ethical as they mature, while gender socialization theory and occupational socialization theory suggest that one’s ethical decision-making is determined by the social norms perceived as prevalent in one’s social group. These theories suggest that age, gender, or work experience will determine one’s ethical viewpoint. The question, however, is which set of norms are brought to bear on one’s decision to engage in software piracy?

2. THEORETICAL BACKGROUND

In spite of international treaties and copyright laws in most countries protecting intellectual property rights, one might think the world is full of digital thieves. Research suggests, however, that software piracy is driven by a complex interplay of economics, culture, and morality [42]. For instance, at the national level, studies typically find a strong negative relationship between economic wealth and the level of software piracy, such
that poorer countries tend to have higher levels of software piracy. The high cost of software is often cited as a motivating reason for pirating software [12, 31].

On the other hand, a number of cultural factors have also been found to be important. For instance, countries that have a more collectivist society also tend to have higher levels of software piracy [39]. A collectivist society is one in which people are integrated at birth into strong, cohesive in-groups that support each other in return for unquestioning loyalty [21]. High collectivist countries such as those in Central America, South America, and South-East Asia tend to have the highest levels of software piracy. These countries also tend to have higher levels of government corruption, which leads to lower economic development and consequently to higher levels of software piracy [38].

Given that software piracy involves the individual act of acquiring and using illegal software, a number of models of ethical decision-making have been developed to explain the motivating factors for software piracy at the individual level. For instance, the Hunt-Vitell model of general marketing ethics includes an assessment of the extent to which deontological and teleological reasoning affects one’s judgment of the acceptability of an action. When applied to decisions about software piracy, judging the consequences of the act (teleological reasoning) dominates [46].

The Theory of Reasoned Action and the Theory of Planned Behavior suggests one’s intention to perform a behavior is determined by one’s attitude towards the act, subjective norms, and any perceived behavioral controls. When applied to ethical problems, attitude and subjective norms tend to dominate [9], while the threat of punishment significantly affects perceived behavioral control [25, 36]. Increasing the perceived threat of punishment or restricting access to essential software updates or patches is seen as one means of controlling software piracy [7].

From moral psychology, the four-component model of moral reasoning suggests that ethical decision-making involves four distinct processes: recognizing the issue at stake (moral sensitivity), judging which action is justified (moral judgment), choosing an action (moral motivation), and resisting distractions (moral character). When applied to a series of ethical scenarios about the availability, cost, and the lack of censure for engaging in software piracy, motivation (intention) determined behavior [30].

While each of these models have something important to say about the psychological antecedents to software piracy, little work has been done to examine the different aspects of the behavior itself, or the different social norms that encompass an individual and will affect their perception of the morality of stealing software. For instance, while models that apply TRA or TPB do take social norms into account, when used to assess software piracy the key endogenous variable is typically attitude or intention, and behavior is not measured. The four-component model does have a measure of behavior, and has been used to assess software piracy behavior in terms of buying and using, but social norms are not explicitly measured. We will address these issues by developing a model that focuses on the influence of socialization on behavior.

We argue that in order to address the behavior involved in software piracy we must explicitly model each type of behavior, especially since studies of music piracy have found that sharing is a critical aspect of online piracy, and threats of censure have little effect [10, 26]. If sharing is now the dominant factor, enforcement agencies need to pay more attention to peer-to-peer websites. On the other hand, if the social group that an individual strongly identifies with abhors the notion of stealing, then a campaign that reinforces or instills this ethical viewpoint is more likely to be effective.

3. RESEARCH MODEL

We suggest that controlling software piracy will be most effective by conducting a campaign that raises the awareness of the illegality of software piracy and persuades individual users that software piracy is simply wrong [32]. To do this, however, we must understand what subjective or social norms are strongest at influencing one’s ethical viewpoint. We hypothesize the socialization process one undergoes will determine the likelihood of engaging in software piracy. We will consider socialization from three perspectives: 1. the cognitive-developmental approach; 2. gender socialization theory; and, 3. occupational socialization theory. The research model is given in Figure 1.

3.1 Behavior

Previous models typically assess attitudes or intentions to engage in software piracy by presenting scenarios depicting acts of software piracy. Although we acknowledge that attitude, judgment, and other factors will influence behavior, we focus on behavior because it is the key to determine if socialization has an effect. In short, we take the view that one’s behavior is a better assessment of one’s ethical decision-making. For instance, someone may recognize that software piracy is illegal but justify their actions in terms of their unique circumstances [19]. We
begin, therefore, by defining behavior as the key dependent variable, with software piracy defined as the acquisition and use of illegal, unlicensed software.

We hypothesize that pirated software can be acquired in one of two ways: Buying and sharing. Buying pirated software involves finding shops or outlets in shopping malls that sell counterfeit software, or by browsing online auction or “warez” websites that contain catalogs of pirated software. Shops selling pirated CDs of software are common in many countries outside Europe and North America. Although it would be very difficult to ascertain the true extent of online piracy, the Business Software Alliance estimates that between 50% and 90% of software being sold on auction websites are pirated copies [4].

Alternatively, pirated software can be acquired by simply sharing copies with friends, family, or colleagues, or downloaded from websites using peer-to-peer (P2P) file sharing software such as LimeWire, Vuze, or BitComet. Therefore, we define sharing as the distribution of software from person to person without any fee being involved. This type of sharing is still illegal. The 1997 No Electronic Theft (NET) Act makes it illegal to engage in copyright infringement even if there is no commercial gain. The legislation was prompted by the 1994 case of an MIT student that maintained a bulletin board service that allowed copyrighted software to be downloaded for free.

Once the software has been acquired, the behavior that is the key focus of anti-piracy campaigns is the level of use. Indeed, the financial loss estimated by the BSA is dependent on the notion that pirated software would otherwise have been purchased legally, that the software is not being used as a “trial” version, and the software continues to be in use. It is an open question, however, whether the network of diffusion is buying or sharing. Our first three hypotheses, therefore, will assess the extent to which buying determines sharing, and the extent to which acquisition determines use, given by:

H1: The level of sharing pirated software increases as the level of buying increases.
H2: The level of using pirated software increases as the level of buying increases.
H3: The level of using pirated software increases as the level of sharing increases.

By defining software piracy as a set of three related behaviors, we will be able to determine whether anti-piracy campaigns have been successful in reducing the buying, sharing, or using of pirated software. We will also be able to assess the extent to which socialization has an impact on each of the three types of behavior.

3.2 Age

Age is one of the most important demographic variables in ethics research. The influence of age is based on the cognitive-developmental approach put forward by Piaget, Kohlberg, and others, which suggests that moral reasoning develops with age through a series of stages based on one’s evolving understanding of the social contract defined for each member of society [24]. Kohlberg suggests that people mature through six cognitive-developmental stages that can be defined as pre-conventional, conventional, and post-conventional.

Pre-conventional stages involve a rudimentary obedience to expected norms (Stage 1), or the striking of deals to satisfy personal wishes and desires (Stage 2). At the conventional stage social norms are established based on empathy (Stage 3), and extended to others by adhering to the rule of law (Stage 4). At the post-conventional stage commitment transfers from specific laws to the process of creating laws based on social consensus (Stage 5), and ultimately an appeal to universal human rights (Stage 6). Not everyone progresses through all six stages, with a modal stage of 4 for males, and 3 for females. Criticisms of the theory include the complexity of the procedure by which the level of moral reasoning is assessed, the high degree of linguistic ability required to express higher forms of moral reasoning, and a simplistic progression from one stage to another [29].

The cognitive-developmental approach would suggest that younger people have a more egocentric view of their needs and wants, and the end often justifies the means. Stealing a piece of software would be justified in terms of a perceived need or want. The repercussions for others of their theft will not be a factor in their moral reasoning. As people get older, however, the importance of abiding by the law becomes a central component of moral reasoning. For people that have attained at least Stage 4, the simple fact that software piracy is illegal becomes sufficient to dissuade them from engaging in piracy. As such, we would expect that as people get older and pass through higher levels of moral reasoning the likelihood of engaging in software piracy will decrease. The influence of age does indeed have a great deal of empirical support [8, 35], with a number of recent studies detecting a strong negative relationship between age and levels of software piracy (e.g., [16]). Our hypothesis, therefore, is:

H4: The level of buying, sharing, and using pirated software declines as age increases.

3.3 Gender

Gender socialization theory argues against the apparent gender bias in Kohlberg’s cognitive-developmental approach and suggests that differences in moral reasoning are due to the different gender roles males and females are meant to have in society. Females are brought up with a care orientation defined in terms of maintaining relationships and empathy for others, while males are brought up with a justice orientation, defined in terms of principles of fairness and equity [17]. This would explain why females are more apt to develop a level of moral reasoning based on empathy (Stage 3), while males develop a level of moral reasoning based on adhering to the rule of law (Stage 4).

The issue of gender remains contentious, although research has tended to support the idea that males and females think and act differently. A recent meta-analysis of the gender socialization theory literature suggests that a care orientation favoring females and a justice orientation favoring males does exist, although it explained only 16-17% of the variance [23]. Where differences exist, females have been found to include more environmental cues in their perception of an action, such as cultural and social norms, while men are more driven by attitudes and intentions [11, 45]. A gender difference is sometimes contingent on the context in which the act takes place [20, 37], while other studies find no gender differences [1, 34].

Gender socialization would suggest any difference detected would be rooted in the different moral perspectives acquired by males and females. Males may be more willing to acquire and use pirated software to exercise a “justice orientation” of having and using the software they need, while females may be less willing
to engage in software piracy because they can empathize with the financial loss suffered by the software manufacturer. Studies often do find a gender difference, with males more likely to pirate than females [40, 41], although the results are still contentious. Our hypothesis, therefore, is:

**H5:** The level of buying, sharing, and using pirated software will be lower for females than for males.

### 3.4 Work experience

Occupational socialization theory suggests that participation in work affects one’s whole cognitive, emotional, and value system [15]. Given the centrality of work in modern society, feelings of social recognition, satisfaction, and well-being can be intimately tied to one’s occupation. Induction into the work setting generates a sense of solidarity with one’s colleagues, which can lead to the adoption of a common group ethic [3]. Recent research suggests it takes about four years for someone to progress from apprentice to “real work” status, with the associated increases in job satisfaction, levels of responsibility, and social recognition [13]. It has even been suggested that early gender socialization may be over-ridden by the perceived demands and expectations of occupying a particular organizational role. These experiences lead to similar ethical values, regardless of gender [27, 44]. This might also explain the ambiguous results when assessing the role of age and gender on ethical decision-making [35].

Occupational socialization does not make clear whether software piracy would be more or less likely, however, given the ethical values acquired at work could be higher or lower than one’s previous moral code. For instance, it could be argued that if software piracy is common in the workplace any newcomer would also engage in software piracy in order to assimilate into the work group. On the other hand, if we assume that people with more work experience are also likely to be older and have greater financial resources, previous literature would suggest that working (i.e., wealthier) people are less likely to engage in software piracy. In this case, the workplace would generate a negative attitude towards software piracy. While both arguments have some merit, the positive relationship between age and wealth and higher levels of moral reasoning has strong empirical support in the literature. Therefore, our final hypothesis is:

**H6:** The level of buying, sharing, and using pirated software declines as the number of years of work experience increases.

### 4. METHOD

Items to measure each of the variables came from existing instruments, where available. Rather than developing a multi-dimensional measure of behavior that might need to be aggregated or averaged, potentially obfuscating the relationship between the variables, we decided to simply ask the most pertinent question, namely: How much do you buy, how much do you share, and how much do you use pirated software? As such, the behavior items were defined in terms of the frequency of behavior, with buying defined in terms of “On average, how frequently do you BUY pirated software?” and a scale of 1-Never to 6-Every day. Sharing and using were defined by similar items, with BUY replaced by ‘BORROW or SHARE’, and ‘USE.’ In each case, the scale remained the same. Measures of socialization were captured as part of the demographic section, with questions about gender, age, and years of full-time employment (excluding summer and part-time work).

Students taking an upper-level Masters course in information management, engineering, and business administration at a university in Thailand were the target sample. Thailand is an ideal location to collect data because the socio-economic conditions that are known to contribute to high levels of software piracy, such as wealth and culture, are prevalent in Thailand. Our sample are therefore responding to questions about something they know, rather than providing an answer to a hypothetical question that may or may not translate into actual behavior.

In particular, Thailand is considered a high-piracy, middle-income, culturally collectivist society; all ingredients of a prime sample for understanding drivers of software piracy. Thailand is on the USTR Priority Watch List [48], and had a piracy rate of 75% in 2009 [5], suggesting that 75% of all software in use is a pirated copy. According to the World Bank, Thailand had a per capita gross national income of $7,440 in 2006, less than the world average of $9,209, but within the range of Middle to Upper Middle Income countries ($6,451-$10,879). Thailand is also considered one of the most collectivist cultures in the world, with a score of 80 significantly higher than the average score of 57 [22].

### 5. RESULTS

The survey was distributed over two semesters as an in-class exercise. No extra credit was awarded for participation. Anonymity was guaranteed with no names or other personally identifiable information collected. A total of 213 usable responses were received with a demographic distribution of 119 males, 94 females, an average age of 27.4, and an average of 3.7 years of work experience. Over 94% own a computer, with an average of 10.6 years of computer use. A comparison of early versus late respondents show no significant differences (p>0.5), which suggests there is no non-response bias. A Harmon one-factor test produces three factors with an eigenvalue greater than 1.0, with the first factor accounting for 31.9% of the variance, well below the threshold of 50%, and suggests there is no common method bias.

A summary of statistics for the continuous variables (i.e., excluding gender and PC ownership) is given in Table 1. It can be seen there is more sharing than buying, while the level of use is very high, corresponding to using pirated software a few times a week. The correlation between variables shows that age is strongly correlated with work experience and PC use, while using pirated software is significantly correlated with PC use. Buying and sharing are also significantly correlated to use. To further distinguish the contribution of buy and share on use, we perform a regression analysis. The results suggest that buying does not significantly contribute to sharing (see Table 2a), while buying and sharing are both significantly related to using (see Table 2b). The partial correlation (BETA) of share in Table 2b is almost twice that of buy and suggests that sharing explains more of the variance in the use of pirated software. These results provide support for H2 and H3, but not H1.

The contribution of socialization on behavior was tested using a 3-way MANOVA, with age, gender, and years of work experience (WEXP) as the independent (factor) variables, and buy, share, and use as the dependent variables. All independent variables were defined as binary. Gender is categorical by default.
Age and work experience were divided into two categories based on being above and below the mean. There is no strict age at which someone attains a level of moral reasoning, and so we attempt to detect differences by comparing younger versus older respondents. Work experience is classified as categorical because recent literature (e.g., [13]) suggests people become “experienced” workers by 4 years in the job. The mean work experience for our sample is 3.7 years and consistent with this threshold. Given the relatively high standard deviations for age and work experience, we use the Tukey Honestly Significant Difference (HSD) test with the Spjøtvoll/Stoline correction for unequal N.

The results (see Table 3) suggest no form of socialization can account for all three types of behavior, although significant differences are found in each category. Younger people are more likely to share than older, males are more likely to buy while females are more likely to share, and people with more work experience are more likely to use pirated software. In terms of interaction effects, the only significant difference involved buying and sharing. For lower work experience groups, males are more likely to buy than females (male = 3.22, female = 2.64, p = 0.001), while for females, those with higher work experience are more likely to share than those with lower work experience (high = 4.42, low = 3.66, p = 0.038). These results provide partial support for H4, H5, and H6. A summary of results is given in Table 4.

6. DISCUSSION

The results of this study might suggest that controlling software piracy is like squeezing a balloon: Holding one part tightly simply results in the balloon expanding in another direction. Our behavioral model initially suggests a somewhat contradictory result in which buying is low while sharing and using are at high levels. Buying is not significantly related to sharing, although buying and sharing are significantly related to using. This would

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std.Dev</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tbody>
<tr>
<td>1. AGE</td>
<td>27.4</td>
<td>4.08</td>
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<td>2. WEXP</td>
<td>3.7</td>
<td>3.68</td>
<td>0.86</td>
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<td>3. PCUSE</td>
<td>10.6</td>
<td>4.27</td>
<td>0.27</td>
<td>0.27</td>
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<td>4. BUY</td>
<td>2.9</td>
<td>0.88</td>
<td>-0.00</td>
<td>0.01</td>
<td>0.08</td>
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<tr>
<td>5. SHARE</td>
<td>3.6</td>
<td>1.05</td>
<td>-0.11</td>
<td>-0.09</td>
<td>0.12</td>
<td>0.13</td>
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<tr>
<td>6. USE</td>
<td>4.8</td>
<td>1.26</td>
<td>0.00</td>
<td>0.01</td>
<td>0.24</td>
<td>0.24</td>
<td>0.38</td>
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NOTE: Significant correlations (p<0.05) shown in bold.

<table>
<thead>
<tr>
<th>Var.</th>
<th>BETA</th>
<th>Std. Err. of BETA</th>
<th>B</th>
<th>Std. Err. of B</th>
<th>t-Test</th>
<th>p-level</th>
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<tbody>
<tr>
<td>(a) Dep.Var. = SHARE (R² = 0.016; F[1,211] = 3.53, p = 0.062)</td>
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<tr>
<td>Intercept</td>
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<td>0.246</td>
<td>13.43</td>
<td>0.000</td>
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<tr>
<td>BUY</td>
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<td>0.152</td>
<td>0.081</td>
<td>1.88</td>
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<tr>
<td>(b) Dep.Var. = USE (R² = 0.182; F[2,210] = 23.33, p = 0.000)</td>
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<td>Intercept</td>
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<td>0.076</td>
<td>5.69</td>
<td>0.000</td>
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</tbody>
</table>

Table 3. Summary results of 3-way MANOVA

9. DISCUSSION

The results of this study might suggest that controlling software piracy is like squeezing a balloon: Holding one part tightly simply results in the balloon expanding in another direction. Our behavioral model initially suggests a somewhat contradictory result in which buying is low while sharing and using are at high levels. Buying is not significantly related to sharing, although buying and sharing are significantly related to using. This would
seem to suggest the source and utilization of pirated software has shifted from a wide range of products bought from shops or online stores to a few items, mostly shared, and used extensively. Given our sample, this narrower range of software is likely to be standard office and educational software, such as MS Office and statistical packages, used by the sample in their normal (student and occupational) work.

One of the key results of this study, therefore, is that by providing a three-part definition of behavior we are able to discover that sharing has twice the impact of buying. That is, the diffusion of pirated software within a social group is less dependent on someone buying a pirated disk in shops or online stores that might be more easily identified and shut down by the authorities, and more on acquiring a copy through friends, colleagues, or peer-to-peer networks. This result has particularly severe consequences for the software industry because it also suggests that very few copies are needed to support the proliferation of pirated software. Furthermore, because copies are being shared, not sold, the average cost of acquisition for each person is approaching zero. The only way software vendors could lure users away from this market would be to also offer the software for free.

In short, if the goal of anti-piracy campaigns is to reduce the level of buying, then the campaigns are succeeding. However, if the goal is to reduce the level of pirated software in use these campaigns do not seem to be working. A continued attack on the source of pirated software will clearly have some impact, with buying and sharing being significant antecedents to use. However, sharing rather than buying now seems to be the most important factor, and it would be difficult to stop the diffusion of pirated software once it has entered the social network. The software to produce product keys have long been compromised [49]. This suggests more sophisticated anti-copying technology is needed to reduce the flow of sharing. With the prevalence of the Internet it might be necessary to require software to be authenticated online, where the software can include some identifying code to ensure only unique copies are installed.

A second key result of this study is that by testing the influence of age, gender, and work experience on levels of buying, sharing, and use, we may have discovered a partial explanation of why the role of age, gender, and work experience is sometimes inconsistent [35]: It depends on the definition of behavior. In particular, we find that younger people were more likely to share pirated software, but there was no difference in levels of buying or using. Given that younger people tend to have less money, this result suggests both an inability to buy legal software and a strong in-group ethic where software is willingly shared with others. Targeting younger individuals is likely to cost more than it saves, however, and can result in a series of public relations disasters. For instance, the Recording Industry Association of America (RIAA) decided to stop pursuing song swappers in December 2008 after five years of embarrassing cases, including suing a 12-year old girl. Settlements from more than 30,000 cases were less than the legal fees incurred by the RIAA [33].

Gender differences also appear contradictory until the bias in the type of behavior is understood. In this case, males are the initiators (buyers) and females are the facilitators (sharers) of the diffusion network. This result suggests once the pirated software has been acquired females become the more likely channel of distribution through sharing. This also suggests that while vendors of digital goods have attempted to throttle the supply of pirated software by aggressively pursuing criminal convictions, consumers have shifted from buying to a new market model, where very few original copies of the software are needed to begin the distribution process.

Years of work experience is the only variable to detect a difference in patterns of use. This result indicates the necessity of software for working professionals, although the level of use probably has more to do with the number of hours involved in using a computer at work rather than a greater propensity to pirate software at the workplace. In other words, only a few packages may be in use, but they all tend to be pirated. The problem for software vendors will continue to be the marketing of a product that is relatively expensive and easily stolen. The issue of fair price again comes to the fore, especially in countries with a per capita gross national income that is a fraction of the United States.

For instance, an OEM license for Windows Vista Business in Thailand is 5500-6000 baht (approx. $165), compared to $150-$200 in the United States. However, the cost in Thailand is equivalent to 74% of Thailand’s per capita gross national income, compared to 0.4% for the United States. To reduce the price to an income level similar to that of the U.S., Windows Vista Business would need to be priced at 30 baht (less than $1) in Thailand. From this perspective, even pirated copies selling for 150 baht are overpriced. Dropping prices would certainly eliminate the “overpriced” argument put forward by some software pirates [30] and encourage at least some to switch to legal copies. A recent experiment by Microsoft, which dropped the price of Windows 7 Home Basic in China to less than a third of the US price, resulting in a significant boost in unit sales [14]. Although Microsoft and other vendors do offer academic discounts that are meant to address this issue for students, the range of software is clearly insufficient for the students in our sample.

Software vendors will need to make a strategic decision in order to deal with this particular problem. It would seem sensible to continue the policy of raids on companies thought to be using pirated software, as well as policing shops and online stores. In July 2010 the BSA received more than $3.3M in settlement from a Japanese company found using unlicensed software [6], while in October 2010 a court order closed down the file swapping site LimeWire [2]. Publicity about these actions are likely to send a powerful message to IT managers to control their software portfolio. At the individual level, however, it has been argued that the piracy market directly supports the legal market by allowing users to “try out” software before they buy [18]. In high piracy countries, such as Thailand, the extent to which “tryers” become buyers can be doubted. Even so, making slimmed-down versions of software for particular markets might be one way of reducing the rate of sharing. Once users become accustomed to having their own copy they may be more likely to buy the full version for their own personal use.

7. FURTHER RESEARCH

A number of areas of further research do present themselves. In particular, if dividing behavior into a three-part definition of buying, using, and sharing allows for a better understanding of exactly how age, gender, and work experience affects software piracy, this would suggest inconsistent results found by other models over the role of particular constructs may be explained by applying a similar multi-part definition of behavior. For instance, in a recent study that looked at piracy in terms of the amount of illegal software on their PC [34], age and gender were not found to be significant. Taking “amount” to be similar to use, the results
of our study agree with this conclusion, but only because age and gender are significant for buying and sharing, not using.

Going beyond a study of software piracy, a multi-part definition of the dependent variable might involve items that expand on the type of agreement given in response to an ethical scenario. For instance, the classic “Heinz” scenario developed by Kohlberg to elicit the stage of cognitive moral development [24] could be related not simply to an agree or disagree response to the behavior of Heinz, but to an agree or disagree response on whether they would themselves behave in the same way, or whether they would approve or disapprove of a close personal friend or family member behaving in this way. With a more expansive definition in place, it might become easier to determine the unique contribution of each variable. Variables that are insignificant are likely to show no relationship with the dependent variable, regardless of the definition, while subtle interplays between variables, which often characterize research in this area, could be detected more readily.

A further area of research could be to combine the TRA/TPB and four component model to develop a socio-cognitive model of ethical decision-making. The two models both include intention as the antecedent to behavior. For TRA/TPB, intention is the product of attitude, subjective norms, and perceived behavioral control. The four-component model could be integrated into this model by having judgment as an alternative antecedent to intention, with recognition the antecedent to judgment. Given that attitude and judgment are often measured using similar semantic-differential scales (acceptable/unacceptable, wise/foolish, etc., etc.), it is possible that these two constructs may be merged and recognition becomes an antecedent to attitude/judgment.

The benefit of this merging is that we have a combination of theories from the social (TRA/TPB) and cognitive (four-component) psychological fields. We could find that ethical scenarios might differ in their sociological versus cognitive response. For instance, we might find that software piracy is an act that has a strong social component, where the act is supported by a positive attitude toward piracy and the social norms of others. Or, software piracy might be deemed a purely a cognitive decision in which the recognition that piracy is illegal is overruled by the judgment that the need justifies the crime. Alternatively, we might find that whatever is deemed morally right also has strong social support. Determining whether the justification for software piracy is a social or cognitive issue would help software vendors tackle the problem. A social campaign would look to show that piracy is not “cool” while a cognitive campaign would look to show that legal software is not a “rip off.”

8. LIMITATIONS

There are a number of limitations to this study that need to be discussed. The sample is self-selected, being members of a class at a particular university at a particular moment in time. The choice of a graduate class was necessary in order to achieve a sample with a sufficient range of age and work experience for differences to be detected. The mean of 27 years old might also suggest our sample is biased towards a more mature sample of individuals that, according to the cognitive developmental approach, ought to express a more ethical viewpoint. Whatever split value is taken for age, however, is always going to be essentially arbitrary. With no definitive age thresholds available, to use anything other than the mean might be considered capitalizing on chance.

There are also a number of other factors that could influence the results that have not been taken into account here. For instance, Thailand is defined as a more collective country in which sharing is a more expected part of social behavior than in more individualistic countries, such as the U.S. [21, 22]. The between-person analysis conducted here should account for this cultural difference. However, we did not ask for income levels to confirm that a lack of money can be a strong motivating factor. It could be argued that students within the same class are likely to have similar socio-economic backgrounds which could explain the lack of difference in buying and using.

Furthermore, whenever a survey asks about illegal behavior, in this case, acquiring and using pirated software, the responses must be treated with some caution. One advantage of a student sample, however, is that respondents do not fear legal retaliation for admitting such behavior. Ensuring the survey remained anonymous will also have helped. Finally, making an ethical decision is a complex thought process, influenced by a multitude of factors. As such, additional measures of economic and personality traits would help enrich the model and would be the goal of future research.

9. CONCLUSIONS

We developed a three-part behavioral model in terms of buying, sharing, and using pirated software, and assessed the impact of three types of socialization on a person’s propensity to engage in software piracy. The goal was to better understand the motivating forces behind software piracy that would need to be addressed by anti-piracy campaigns. The most common tactic currently used is a legislative campaign threatening legal sanctions against a predominantly younger demographic. This tactic may be having some success, with low levels of buying being detected.

However, the level of sharing and using remains high, and suggests a shift from buying to downloading, and towards a diffusion network among family, friends, and colleagues that requires fewer purchases and is maintained principally by female members. Anti-piracy campaigns will need to adapt to this new market model and take account of these underlying socio-cultural forces if levels of software piracy are to be reduced further. The high levels of use among working professionals and the high cost of legal software in Thailand suggest the economic issues related to software piracy have yet to be addressed by software manufacturers.

REFERENCES


**APPENDIX**

**Survey Items**

**BUY:** Buying pirated software. On average, how frequently do you **BUY** pirated software? (Scale: 1-Never, 2-Almost never, 3-A few times a year, 4-A few times a month, 5-A few times a week, 6-Every day.)

**SHARE:** Sharing pirated software. On average, how frequently do you **BORROW** or **SHARE** pirated software with other people? (Scale: 1-Never, 2-Almost never, 3-A few times a year, 4-A few times a month, 5-A few times a week, 6-Every day.)

**USE:** Using pirated software. On average, how frequently do you **USE** pirated software? (Scale: 1-Never, 2-Almost never, 3-A few times a year, 4-A few times a month, 5-A few times a week, 6-Every day.)

**AGE:** Age. How old are you? (Scale: ____ Years.)

**GENDER:** Gender. Are you male or female? (Scale: ____ Male, ____ Female.)

**WEXP:** Work experience. How many years of full-time employment do you have? (Exclude summer and part-time work.) (Scale: ____ Years.)