

## Digital Piracy: Factors that Influence Attitude Toward Behavior

Sulaiman Al-Rafee  
Timothy Paul Cronan

**ABSTRACT.** A new form of software piracy known as digital piracy has taken the spotlight. Lost revenues due to digital piracy could reach \$5 billion by the end of 2005. Preventives and deterrents do not seem to be working – losses are increasing. This study examines factors that influence an individual's attitude toward pirating digital material. The results of this study suggest

that attitude toward digital pirating is influenced by beliefs about the outcome of behavior (cognitive beliefs), happiness and excitement (affective beliefs), age, the perceived importance of the issue, the influence of significant others (subjective norms), and machiavellianism. Given these results, measures can be developed which could alter attitudes toward digital piracy.

---

*Sulaiman Al-Rafee received his Ph.D. in Information Systems from the University of Arkansas in the USA, May, 2002. He is an assistant professor of Information Systems at the department of Quantitative Methods and Information Systems at the College of Business Administration, Kuwait. He is the MIS coordinator at the department, and has taught different MIS courses within the department. His research interests include: ethics, behavioral psychology, software and digital piracy, user acceptance of information technology, and cross-cultural studies.*

*Timothy Paul Cronan, Professor and M.D. Matthews Chair in Information Systems, University of Arkansas, Fayetteville, Arkansas. Dr. Cronan received the D.B.A. from Louisiana Tech University and is an active member of the Decision Sciences Institute and The Association for Computing Machinery. He has served as Regional Vice President and on the Board of Directors of the Decision Sciences Institute and as President of the Southwest Region of the Institute. In addition, he has served as Associate Editor for MIS Quarterly. He is currently Director of Enterprise Systems and Director of the Master of Information Systems degree programs. His research interests include information systems ethical behavior, work groups, change management, expert systems, performance analysis and effectiveness, and end-user computing. Publications have appeared in MIS Quarterly, Decision Sciences, Journal of Business Ethics, Information and Management, OMEGA The International Journal of Management Science, The Journal of Management Information Systems, Communications of the ACM, Journal of Organizational and End User Computing, Database, Journal of Research on Computing in Education, Journal of Financial Research, as well as in other journals and Proceedings of various Conferences.*

**KEY WORDS:** attitude toward digital piracy, ethical behavior.

### Introduction

During the last decade, much research has been dedicated to the study of ethics and ethical behavior in business. Ethical situations arise often in many different areas of business, and this has been complicated by the integration of Information Systems (IS) into business operations. One issue that has been in the news lately is the issue of intellectual property, and specifically software piracy, which has been identified as a major problem facing the \$140 billion software market (Lau, 2003).

While software piracy has received much interest (with an estimated \$13 billion in lost revenues in 2002) (Business Software Alliance, 2003), a new form of piracy has taken the piracy spotlight and being called the next big piracy arena (Bhattacharjee et al., 2003). Referred to as Digital Piracy, and defined in this paper as, “the illegal copying/downloading of copyrighted software and media files”. According to the Forrester research group (<http://www.forrester.com>), lost revenues due to digital piracy could reach \$5 billion alone from music and book publishers by the year 2005 (not counting losses from software companies or cinema studios). The next big piracy target apparently will be Hollywood, as the Motion Picture Association of American (MPAA) estimates that around 400,000–

600,000 movies are being copied/downloaded on the Internet everyday (MPAA Report, 2003).

To combat piracy, two popular methods have been employed: preventives and deterrents. Preventives impede the act of piracy by making it very hard to do so. The idea is to make the pirates expend so much effort that it will wear them down, and eventually they will not want to do it. Deterrents, on the other hand, use the threat of undesirable consequences (mostly legal sanctions) to prevent piracy (Gopal and Sanders, 1997). Unfortunately, none of these strategies seem to be working; this is evident by amount of losses published by the Business Software Alliance (BSA) in the last few years (the Asia/Pacific area had piracy losses increase from \$2.7 Billion in 1998 to \$4.7 Billion in 2001 according to the BSA) and the expected increases in non-software piracy.

Instead of relying solely on preventives and deterrents, knowing what might influence individuals to pirate would be a more advantageous path. This is especially important because many studies have suggested that individuals do not see piracy as a crime or an unethical issue (Im and Van Epps, 1991; Reid et al., 1992). Solomon and O'Brien (1990) examined attitude towards piracy among business students and found that they view piracy as socially and ethically acceptable, and that piracy is widespread among business students. Christensen and Eining (1991) also found that individuals do not perceive piracy as inappropriate and they do not believe their friends and superiors think it is inappropriate.

The purpose of this study is to identify factors that influence an individual's attitude toward the decision to commit digital piracy. While much of the previous research concentrated on the piracy behavior and how to control it (Conner and Rumlet, 1991; Glass and Wood, 1996; Gopal and Sanders, 1997; Moseley and Whitis, 1995), this study examines the factors that influence the attitude regarding such a behavior. By doing so, measures to alter those factors can be implemented (and thus influence behavior indirectly) that would reduce digital piracy.

## Related literature

### *Piracy*

Eining and Christensen (1991) developed a model of factors influencing individuals with regard to soft-

ware piracy. Their model identified five factors that influenced this behavior: computer attitudes, material consequences, norms, social-legal attitudes, and effective factors. Their findings suggested that all of the variables (except for socio-legal attitude) had a significant influence on the piracy behavior. Simpson et al. (1994) examined factors influencing softlifting (piracy done by individuals for individual use). The authors identified five factors that influenced decision-making: stimulus to act, socio-cultural factor, legal factor, personal factors, and situational factors. The results of the study suggested that personal and situational factors had an influence on the softlifting behavior.

Thong and Yap (1998) also attempted to explain softlifting (software piracy done by individuals) by using Hunt and Vitell's (1986) ethical decision-making theory. The theory suggests that individuals are influenced by deontological (where rules define what is ethical or not) and teleological (examine the consequences of the behavior) evaluations, both of which were found to influence the decision to pirate.

Limayem et al. (1999) based their model on Triandis' behavioral model (1980) to explain software piracy. Their study used a longitudinal design to study piracy within business students. The study used the following variables to explain the behavioral process: social factors, perceived consequences/beliefs, habit, affect, facilitating conditions, and intention. The results of the study indicated that only social factors and perceived consequences had an influence on the piracy behavior.

### *Attitude*

Attitude has been long acknowledged as the most important construct in social psychology (Allport, 1935). This is evident by the overwhelming amount of research published in this area (Ajzen, 2001; Olson and Zanna, 1993; Petty et al., 1997). Attitude has also been found to be the most significant factor influencing behavioral intention. A review by Trafimow and Finlay (1996) found that attitude was the best predictor of intention in 29 out of 30 studies. A recent software piracy study (Peace et al., 2003) found that attitude had the strongest effect on intention to pirate software. Moreover, they found that 24% of the

variance in attitude toward software piracy was explained by punishment and software cost.

A compelling reason why attitude is so important is the fact that attitude can be changed through persuasion and other means. An abundance of research regarding attitude change and persuasion exists in the psychology literature (Olson and Zanna, 1993). Since attitude is the most significant predictor of intention (Beck and Ajzen, 1991) (which in turn, is the best predictor of the actual behavior), then behavior could possibly be influenced through attitude change and persuasion.

Given the previous discussion and the increased incidence of piracy, this study examines attitude towards digital piracy. Factors that influence attitude are identified from various areas in the ethics and psychology literature. This study is important since it focuses on digital piracy as well as examining the antecedents of attitude toward piracy. While most of previous research has concentrated on software piracy, this study focuses on *digital* piracy, an emerging type of piracy that is overtaking software piracy in terms of lost sales. Moreover, this study, unlike previous studies, examines the antecedents of attitude, the most important construct in social psychology according to Allport (1935). While attitude has been studied mostly as an independent variable, it is examined as a dependent variable in the present study.

Attitude has been shown to significantly affect intention. If attitude can be changed, then intention may be influenced (and subsequently behavior may be influenced). A stream of literature regarding attitude change exists, and if applied to digital piracy, will prove to be an excellent choice that can be used to combat and deter digital piracy.

### Digital piracy attitude model

To identify these factors influencing attitude towards digital piracy, a review of behavioral/ethical research was undertaken. The Theory of Planned Behavior (TPB) has been used to identify and explain different kinds of behavior including ethical/unethical behavior (Dubinsky and Loken, 1989; Randall and Gibson, 1991). The TPB asserts that intention to perform a behavior is based on one's attitude towards the behavior, the social influence to perform/not perform the behavior (Subjective Norms), and one's

control over performing such a behavior (Perceived Behavioral Control) (Ajzen 1991).

Since the ethics literature often examines ethical judgment/evaluation and not attitudinal judgment, there is a need to justify extending the TPB with factors from the ethics literature. Ethical behavior is one kind of general behavior that is usually studied using TPB. The attitude construct is the closest match to ethical judgment in the TPB model (compared to subjective norms, perceived behavioral control, intention, or behavior). Both attitude and ethical judgment have been used to explain intention/behavior, and the TPB has been used to explain ethical behavior (Banerjee et al., 1998; Dubinsky and Loken, 1989; Flannery and May, 2000 Randall and Gibson, 1991). Both are judgments or evaluations about a particular behavior. And, both lead to intention, which in turn leads to some kind of behavior. Attitude and ethical judgment are not the same thing, yet what affects ethical decision-making could also affect attitude. Based on a meta-analysis of studies to identify which factors have been used repeatedly and were consistently found to be significant determinants of attitude and ethical decision-making, three factors were identified as follows – individual characteristics/attributes, moral judgment, and moral obligation.

One of the major components of the TPB is attitude, generally agreed upon to be the best predictor of intention (Allport, 1935). While *Attitude toward digital piracy* has been used in other studies as an independent variable, in this study attitude is treated as a dependent variable. Based on the previous review of variables influencing attitude, a model of digital piracy attitude is developed. The following section includes a discussion on those factors that influence attitude.

#### *Moral judgment*

Moral Judgment has been used in ethics research to predict ethical judgment and attitude. This factor is defined as the way a person reasons when faced with an ethical dilemma (Kohlberg, 1969). Tan (2002) used moral judgment as a factor influencing ethical decision-making towards buying pirated software. According to Kohlberg, individuals reason out moral

situations differently in accordance with levels of moral reasoning – pre-conventional morality (avoiding punishment or getting caught), conventional morality (conforming to social beliefs, abiding by laws and regulations, caring what others feel about them), and post-conventional morality (guided toward conformity to shared standards and duties other than authorities, principles are dominant). According to Kohlberg, individuals high in moral judgment would examine their actions and compare them to the goodness of the society. Then, they conclude themselves as having high ethical values. Based on that, the higher an individual's moral judgment, the lower their attitude towards digital piracy will be.

H1: Individuals who are high on the moral judgment scale will have a lower attitude towards digital piracy

#### *Sex (Gender)*

Sex and age have been included as variables affecting attitude in ethical decision-making. Previous attitude research has focused on the effect of individual characteristics on attitude (Solomon and O'Brien, 1990) found that individual and personal factors do influence attitude towards software piracy. Other studies have examined the relationship between attitude and different personal characteristics/traits – age, sex, among others. While some studies found gender to have no influences, other studies have found gender to influence ethical decision-making (Khazanchi, 1995; Leonard and Cronan, 2001; Loch and Conger, 1996; Reiss and Mitra, 1998). Individual characteristics and attributes have been used frequently in the ethics literature to predict ethical decision-making. The ethics literature suggests that females have a higher ethical standard than males (Ford and Richardson, 1994). Sims et al. (1996) found that male students pirated software more often than female students. Based on that, it is expected that females would have a lower attitude (think it is unethical) towards digital piracy than males. At the same time, sex (gender) may have an indirect effect on attitude through other variables. H2 will help to determine whether sex has a direct effect on attitude.

H2: Females will have a lower attitude towards digital piracy than males

#### *Age*

The ethics literature suggests that older individuals have higher ethical standards than younger individuals (Auerbach and Welsh, 1994; Barger et al., 1998; Ford and Richardson, 1994). Younger individuals tend to have less concern regarding ethical consideration that they encounter (Coombe and Newman, 1997). There exists a large body of ethics literature that is concerned with individual attributes and their effect on ethical decision-making. Based on this, it is expected that older subjects would have a lower attitude (think it is more unethical) towards digital piracy than younger subjects. Age may also have an indirect effect on attitude through other variables. H3 will help to determine whether age directly affects attitude.

H3: Older subjects will have a lower attitude towards digital piracy than younger subjects

#### *Machiavellianism*

Machiavellianism has also proved to be a consistent factor influencing ethical decision-making (Bass et al., 1999; Hegarty and Sim Jr., 1978; Hegarty and Sims Jr., 1979; Jones and Kavanagh, 1996; Singhapakdi and Vitell, 1992). The literature (Bass et al., 1999; Singhapakdi and Vitell, 1992) suggests that individuals with a high Machiavellianism will not be concerned about unethical behavior. Based on that, high Machiavellianism individuals will have a higher attitude towards digital piracy.

H4: Individuals with high Machiavellianism will have a higher attitude towards digital piracy

#### *Cognitive beliefs*

According to the TPB, Attitude is determined by the behavioral beliefs of the individual (Ajzen, 1985). These beliefs are usually elicited from a representative sample of the population and are used to predict attitude. According to Bodur et al. (2000) cognitive beliefs have been used to determine attitude in much of the previous research. These beliefs have been used as the dominant explanation for attitude and attitude change in the psychology literature (Fishbein and

Middlestadt, 1995), and have historically been labeled as cognitive beliefs. Cognitive beliefs represent the individual's opinion about an object (in terms of attributes or characteristics of an object) or behavior (in terms of outcomes of a behavior). Positive beliefs (and evaluation of these beliefs) would correspond to higher attitude towards digital piracy.

H5: Individuals with positive/higher beliefs/evaluations will have a higher attitude towards digital piracy

#### *Affective beliefs*

Early attitudinal research examined attitude as a one-dimensional factor based on cognitive beliefs (beliefs about the outcomes of behavior/attributes of an object). However, more recent research has produced evidence that attitude is not only based on cognitive beliefs, but also on affective beliefs, on feelings and emotion towards performing the behavior or the object (Bodur et al., 2000; Haddock and Zanna, 1998; Trafimow and Sheeran, 1998). Originally believed to be antecedents of cognitive beliefs, affective beliefs have been demonstrated as having direct influence on attitude (Bodur et al., 2000). Holbrook and Batra (1987) established several affective beliefs that influenced attitude. Haddock and Zanna (1998) found that both affective and cognitive beliefs were important in predicting attitude towards capital punishment. Trafimow and Sheeran (1998) examined affective and cognitive beliefs and found that they are separate constructs that independently influenced attitude. Kempf (1999) found that affective beliefs were separate and independent of cognitive beliefs in his study about product trials. Verplanken et al. (1998) also provided support for the affective-cognitive model of attitude. Bodur's et al. (2000) study provided further evidence that affect does influence attitude directly and independently of cognitive beliefs. Given this, the following hypothesis will be tested:

H6: Individuals who score high on the excitement and happiness scale will have a higher attitude towards digital piracy, and who score high on the distress scale will have a lower attitude towards digital piracy

#### *Perceived importance*

Moreover, the actual behavior in question is also known to have an effect on attitude. Robin et al. (1996) theorized that the perceived importance of the issue (P1) will have an effect on an individual's judgment. In addition, other studies have found issue characteristics to influence ethical judgment (Banerjee et al., 1998; Robertson et al., 2002). The literature suggests that the more important an issue is, the more likely that individuals would view that issue as unethical; thus, the more important the issue, the lower the attitude towards digital piracy.

H7: The more important the issue, the lower the attitude towards digital piracy

#### *Subjective norms*

There is also evidence that suggests that subjective norms also influence attitude (Chang, 1998; Shepherd and O'Keefe, 1984; Shimp and Kavas, 1984; Vallerand et al., 1992). Since one's attitude (or ethical attitude) towards a specific behavior is likely to be influenced by significant others (Bommer et al., 1987; Kreie and Cronan, 1999a, b). Subjective norms are theorized to influence attitude. The higher the evaluation of subjective norms (significant others have a favorable opinion towards the behavior), the higher attitude towards digital piracy.

H8: Higher subjective norms will correspond with higher attitude towards digital piracy

Based on the previous discussion, a digital piracy attitude model (see Figure 1) is developed as follows:

$$\begin{aligned} \text{Attitude toward digital piracy} = & \\ & F(\text{Moral Judgment, Sex, Age, Machiavellianism,} \\ & \text{Affective Beliefs, Cognitive Beliefs, Perceived} \\ & \text{Importance, Subjective Norms}) \end{aligned} \quad (1)$$

#### **Instrument measures**

*Moral judgment* is measured using the defining issues test (DIT) developed by Rest (1986). The DIT is composed of ethical scenarios each involving a

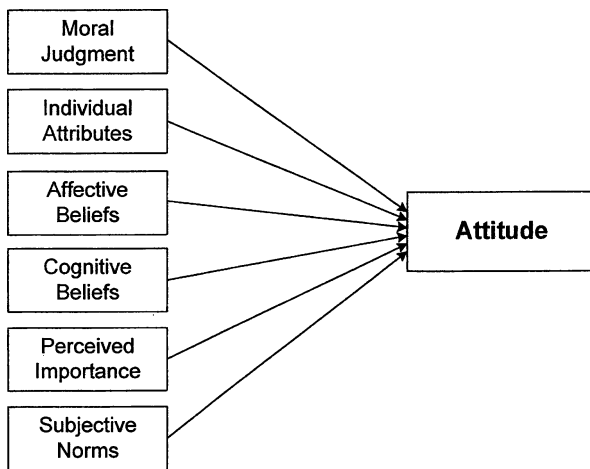


Figure 1. Digital piracy attitude model.

different moral dilemma, each with several questions about the scenario. Moral judgment is represented by the P-index score. This index has been commonly used as an overall score of moral judgment (Rest et al. 1999a, b). The P-index represents the percentage of the time subjects make decisions based on high moral judgment areas (level 5 or 6). (Rest et al. 1999a, b) examined over 400 published articles that used the DIT and demonstrated validity and reliability of the DIT instrument.

The *Machiavellianism* measure is based on the MACH IV (Christie and Geis, 1970) scale. The scale is composed of 20 items (10 items of which are reverse worded) that include questions addressing tactics, views, and morality. The items include questions like “most people are basically good and kind”, and “anyone who trusts anyone is asking for trouble”.

The *Affective beliefs* measure, Bodur et al. (2000), used four categories (arousal, elation, pleasantness, and distress) to assess their affective beliefs construct. Other researchers have used a two-dimensional structure based on pleasure and arousal (see Bodur et al., 2000). In this study, a three-dimensional affective structure is used to measure affective beliefs – excitement (arousal), happiness (pleasantness), and distress. The first two factors (excitement and happiness) have been used previously in the two studies. Distress was also used since it is an element of nervousness/fear when a subject downloads/copies digital material illegally (as a result of the illegality of the behavior or not knowing whether one was downloading a virus, for example). The

scale used in this study consists of nine items; the first six items were associated with happiness and excitement, while the latter three were related to fear and nervousness (referred to as distress in this study). Subjects are asked to express how they felt about the pirating behavior on a seven-point scale ranging from “not at all” to “very much”.

To assess these salient beliefs (*Cognitive beliefs*), a standard method has been suggested (Fishbein and Ajzen, 1975) for collecting and obtaining these beliefs. These beliefs are different in the case of beliefs toward a behavior versus the case of beliefs toward an object. When eliciting beliefs toward a behavior, beliefs should be based upon the outcome/consequences of the behavior. Beliefs about an object on the other hand, require that beliefs should be based upon the characteristics/attributes of the object (Fishbein and Middlestadt, 1995).

To assess these cognitive beliefs, a representative sample of subjects is gathered and respondents are asked questions regarding the behavior. The questions assess the respondent’s beliefs about the outcome of the behavior (Fishbein and Ajzen, 1975). Specifically, respondents are asked three questions regarding the behavior, as follows: “What are the advantages, if any, of Digital piracy”, “What are the disadvantages, if any, of Digital piracy”, and “Is there anything else you associate with Digital piracy”. A content analysis was previously performed on the beliefs and very similar beliefs are combined into one. Beliefs mentioned by at least 10% of the sample are selected for the scale, and each of these beliefs is weighted according to its importance (Fishbein and Middlestadt, 1995). Given this, a set of beliefs was used (see Appendix A for study questionnaire) that related to saving money when pirating digital material, getting caught, convenience, and the belief that digital material is overpriced, among others.

*Subjective norms* have been assessed by asking subjects whether significant others approve or disapprove the behavior in question. Items include questions such as “Most people who are important to me think that I should not pirate digital content”, and “When considering digital piracy, I wish to do what most important people to me think”, and answered using a seven-point Likert scale ranging from “strongly agree” to “strongly disagree” (Ajzen, 1991). In total, three items assessing subjective norms were used in this study.

*Perceived importance* is measured based on Robin's et al. (1996) instrument. The instrument is composed of four items with questions related to the importance of the issue at hand. Respondents are asked to indicate their perception on the extent of the importance of the issue with each of the items using a seven-point scale ranging from strongly agree to strongly disagree.

*Attitude* is assessed with items relating to the overall favorableness/unfavorableness of the behavior as suggested by Fishbein and Ajzen (1975). Respondents are presented with the sentence, "Overall, my attitude towards Digital Piracy is:". Semantic differential items are used to answer the question and assess attitude. For this study, attitude is measured using four items (good/bad, harmful/beneficial, positive/negative, and favorable/unfavorable) scored on a seven-point scale ranging from strongly agree to strongly disagree. Different semantic differential items that have been used include good/bad, favorable/unfavorable, pleasant/unpleasant, harmful/beneficial, useful/useless, positive/negative, pro/anti, harmful/beneficial, nice/awful, and wise/foolish among others (Bodur et al., 2000; Chang, 1998; Flannery and May, 2000; Madden et al., 1992; Trafimow, 1996).

It should be noted that some items in the questionnaire were reverse worded to assist in instrument reliability. A complete copy of the instrument used is available in Appendix A.

## Sampling

The sample for this study is based on a student sample from a business college at a university in the Midwest<sup>1</sup>. Students are the target populations, since a high proportion of students have been shown to pirate (Im and Van Epps, 1991; Sims et al., 1996; Solomon and O'Brien, 1990). Moreover, student samples would be adequate and a representative sample. Student samples have been previously used in ethics literature to explain ethical behavior (Khazanchi, 1995; Kreie and Cronan 1999a, b, 2000; Leonard and Cronan, 2001; Loch and Conger, 1996; Rest, 1986; Reiss and Mitra, 1998) and software piracy (Eining and Christensen, 1991; Glass and Wood, 1996; Kuo and Hsu, 2001; Simpson et al., 1994; Solomon and O'Brien, 1990; Wagner and Sanders, 2001).

The instrument was administered to a total of 11 classes during regular class time (one sophomore class, seven junior classes, two senior classes, and one graduate class). The classes were a regular business classes from different departments within the college (the graduate class is a general MIS class). A total of 292 questionnaires were collected for this study. Seven questionnaires were deemed suspect and were discarded. Of the seven questionnaires discarded, four questionnaires had a consistent case of "column-checking" of scales with reverse items, and three questionnaires were discarded because one or more pages were left unanswered. Consequently, for the analysis, 285 questionnaires were used.

A review of the sample indicates that the average age for the students in the sample was 23.5 years, 171 (58.6%) of which were male students and 121 (41.4%) were female. The students had an average GPA of 3.1, and an average full-time work experience of 2.3 years. The majority of the students (76.7%) were either in their junior or senior year.

## Analysis and results

To establish construct validity, three components were examined (O'Leary-Kelly and Vokura, 1998) – unidimensionality, reliability, and validity. Exploratory Factor Analysis (EFA) (Pedhauzr and Schmelkin, 1991) was used to check unidimensionality. All the scales loaded on one factor, except for the affect scale. The affect scale produced two factors (as expected): the first factor extracted loaded on the first six items (happiness and excitement), and the second factor extracted loaded on the last three items (distress). Overall, tests on these different scales provide evidence of the unidimensionality of the constructs used in this study (Table I).

Cronbach's alpha is used as a measure of reliability (Pedhauzr and Schmelkin, 1991). An alpha value of 0.7 and above has been used as a lower limit for reliable measures (Nunnally, 1978). All of the scales were shown to be reliable (with most scales having an alpha value above 0.86). The MACH scale (where five items were removed to improve reliability) had the lowest Alpha score of 0.73 (Table I).

The final step in establishing construct validity is the establishment of convergent and discriminant

TABLE I  
Summary of findings

Scale	Unidimensionality	Reliability	Convergent
Machiavellianism (15 items)	3 Factors (as suggested by literature)	$\alpha=0.7384$	All items loaded significantly on factor
Importance (4 items)	1 Factor	$\alpha=0.936$	All items loaded significantly on factor
Affective (9 items)	2 Factors (happiness and distress)	$\alpha=0.862$	All items loaded significantly on factor
Attitude (4 items)	1 Factor	$\alpha=0.908$	All items loaded significantly on factor
Subjective norms (2 items)	1 Factor	$\alpha=0.757$	All items loaded significantly on factor
PBC (5 items)	1 Factor	$\alpha=0.943$	All items loaded significantly on factor
Moral obligation (3 items)	1 Factor	$\alpha=0.76$	All items loaded significantly on factor
Intention (3 items)	1 Factor	$\alpha=0.979$	All items loaded significantly on factor

validity. Convergent validity is a measure of how well the items load on their corresponding factors. Discriminant validity on the other hand, is demonstrated by checking the correlations between the factors, and whether they are significantly different (Pedhauzr and Schmelkin, 1991). Convergent validity is checked by examining the significance of item loadings on their corresponding factor (Confirmatory Factor Analysis, CFA) for each of the scales in the study (Pedhauzr and Schmelkin, 1991). Each of the scales demonstrated convergent validity. For discriminant validity, an approach was employed where the correlations between the latent variables are tested and checked to see they are different than 1 (Bagozzi and Phillips, 1991). Using Fisher's Z-transform test, a test of the correlations between the factors was performed and demonstrated discriminant validity. Table I summarizes the factor, reliability, convergent, and discriminant analyses results.

Stepwise regression analysis was used in this study to examine factors that influence (explain) attitude toward digital piracy behavior (Tabachnick and Fidell, 1996). A check of the assumptions related to multiple regression analysis and an outlier analysis was accomplished. Results indicated that the model met the assumptions<sup>2</sup>. In stepwise regression, the

model begins with no independent variables. An independent variable enters the model only if it significantly contributes (statistically) to the regression model. Moreover, an independent variable would also be deleted from the model when it is no longer significantly (statistically) contributing to the regression. Since this is an exploratory study, an entry significance value of 0.09 and an exit significance of 0.10 were utilized.

SPSS software was used for the stepwise regression analysis. Figure 2 shows the digital piracy attitude model results (bold lines indicate significant relationships, and the values on each relationship line correspond to the standardized coefficient and the *p*-value for that coefficient).

Table II provides a summary of the stepwise regression analysis results.

In summary, the piracy attitude regression model contained the following significant variables:

$$\text{Attitude toward digital piracy} = F(\text{Subjective Norms, Happiness and Excitement, Perceived Importance, Age, Machiavellianism, Cognitive Beliefs}) \quad (2)$$

The stepwise regression analysis resulted in a model with an overall  $R^2$  of 0.436. Restated, 44% of the



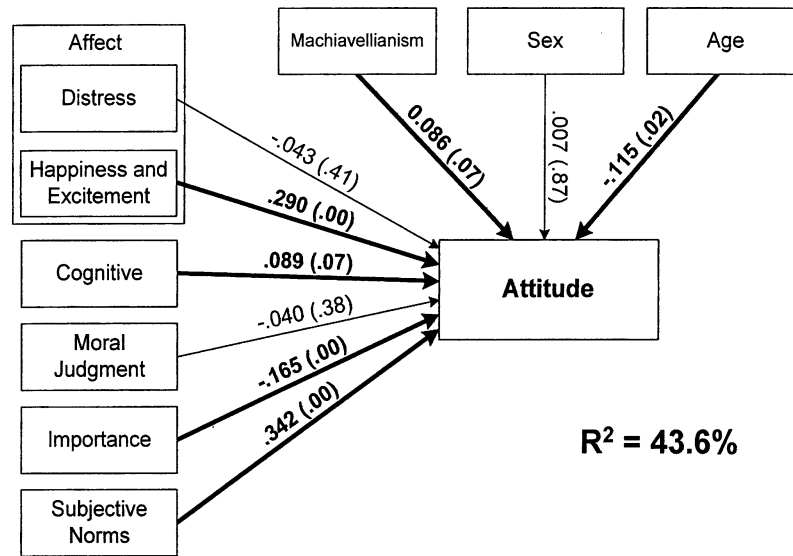


Figure 2. Digital piracy study results.

TABLE II  
Regression results for the model

	Standardized Coefficients	t-value	Significance
Subjective norms	0.342	6.647	0.000
Happiness and excitement	0.290	5.863	0.000
Importance	-0.165	-3.442	0.001
Age	-0.115	-2.353	0.019
Machiavellianism	0.086	1.821	0.070
Cognitive	0.089	1.809	0.072
Distress	-0.043	-0.812	0.417
Moral judgment-P-Index	-0.040	-0.870	0.385
Sex	0.007	0.158	0.874

variation in attitude toward digital piracy is explained by beliefs about the outcome of behavior (cognitive behavior), happiness and excitement, age, the perceived importance of the issue, the influence of significant others (subjective norms), and machiavellianism. Moral judgment, distress, and sex were not significant variables in the regression model. Results are discussed in the Conclusions and discussion section of the paper.

Individual hypotheses are tested using the results of the regression analysis (Table II). Moral judgment is represented by the P-index score. This index has been commonly used as an overall score of moral judgment (Rest et al.,1999). The P-index represents the percentage of the time subjects make decisions

based on high moral judgment areas (level 5 or 6). Scores for this variable ranged from 0 to 85, with the average at 33.2. The hypothesis was stated as follows:

H1: Individuals who score high on the moral judgment scale will have a lower attitude towards digital piracy

Examining the results of the stepwise regression, moral judgment was not a significant variable influencing attitude. While the direction of the relationship (-0.040) is negative (as predicted), the relationship between moral judgment and attitude was found to be insignificant. Thus, H1 hypothesis is rejected.

The sex of the subject was hypothesized to affect attitude towards digital piracy. Males were expected to have a higher (more favorable) attitude toward digital piracy than females.

H2: Females will have a lower attitude towards digital piracy than males

While there were differences in the overall attitude between males and females (mean of 4.36 for males, and 4.12 for females.), the difference was not statistically significant ( $p$ -value of 0.874). Based on this, we reject the H2 hypothesis, and conclude that there are no differences between males and females regarding their attitude towards digital piracy.

The age of the subject was hypothesized to affect attitude towards digital piracy. Older subjects were expected to have a lower (less favorable) attitude toward digital piracy than younger subjects.

H3: Older subjects will have a lower attitude (less favorable) towards digital piracy than younger subjects

Examining the results of the stepwise regression, age was a significant variable influencing attitude. Based on the previous discussion, we do not reject the hypothesis, and conclude that older subjects have a lower (less favorable) attitude towards digital piracy than younger subjects.

Machiavellianism was hypothesized to positively affect attitude towards digital piracy. The relationship was hypothesized to be positive as follows:

H4: Individuals with high Machiavellianism will have a higher attitude towards digital piracy

The results of the stepwise regression indicate that Machiavellianism was a positive and significant variable influencing attitude. Machiavellianism was a significant variable affecting attitude (at the 0.1 level). As expected, there was a positive relationship between Machiavellianism and attitude. Hypothesis H4 is then not rejected, and we conclude that subjects with high Machiavellianism will tend to have a higher attitude (higher propensity to pirate) towards digital piracy.

Affective beliefs were also hypothesized to affect attitude. Happiness and excitement beliefs were

supposed to affect attitude positively. The feeling of distress was hypothesized to affect attitude negatively.

H5: Individuals who score high on the excitement and happiness scale will have a higher attitude towards digital piracy, and who score high on the distress scale will have a lower attitude towards digital piracy

Given the results of the stepwise regression, excitement and happiness feelings were a significant variable influencing attitude, but distress feelings were not. Happiness and excitement feelings were a significant (and a positive) predictor of attitude. Individuals who feel happy/excited when pirating digital media tend to have a higher/favorable attitude towards digital piracy. Distress, on the other hand, was not a significant predictor of attitude. Distress (as expected) was related negatively (although not significantly) with attitude. Thus, the first part of Hypothesis 5 (happiness and excitement) is accepted, and the second part (related to distress) is rejected.

Cognitive beliefs were hypothesized to affect attitude positively. That is, the higher the beliefs, the higher the attitude toward digital piracy.

H6: Individuals with positive/higher beliefs/evaluations will have a higher attitude towards digital piracy

The results of the stepwise regression, cognitive beliefs were significantly affecting attitude. Cognitive beliefs were a significant (and a positive) predictor of attitude. Thus, the higher/favorable the beliefs, the higher/favorable the attitude is towards digital piracy. Hypothesis 6 is then not rejected.

Perceived importance was hypothesized to affect attitude negatively. That is, the higher the importance, the lower the attitude toward digital piracy.

H7: The higher the importance of the issue will be, the lower the attitude towards digital piracy

The results of the stepwise regression show that perceived importance was a significant variable influencing attitude. Perceived importance was a significant (and a negative) predictor of attitude. The higher the perception of importance, the lower the attitude towards digital piracy would be. Hypothesis

7 is not rejected, and we conclude that individuals tend to have a lower attitude towards an ethical issue when they perceive the issue to be an important one.

Finally, subjective norms were hypothesized to affect attitude positively. That is, the higher approval from important others regarding digital piracy, the higher the attitude would be towards digital piracy.

H8: Higher subjective norms will correspond with higher attitude towards digital piracy

The results of the stepwise regression indicate that subjective norms was a highly (at the 0.00 level) significant (and a positive) predictor of attitude. Subjective norms were a significant (and a positive) predictor of attitude. This would imply that the opinion of important others does affect one's attitude. Hypothesis 8 is therefore not rejected.

## Conclusions and discussion

Antecedents to attitude were investigated in this study. An attempt was made to categorize and identify the different factors that influence attitude. While behavioral research has typically used attitude as an independent variable, attitude was used as a dependent variable in this study.

Using established research from the ethics and psychology fields, different variables were hypothesized to affect an individual's attitude towards digital piracy. Given these research studies, an instrument was developed, administered to a student sample, and validated. The results of the analysis supported the digital piracy model explaining 43.6% of the variance in attitude toward digital piracy.

The purpose of this study is to identify factors that influence an individual's attitude toward the decision to commit digital piracy. This study examines the factors that influence the attitude regarding such a behavior. By doing so, measures to alter those factors can be implemented (and thus influence behavior indirectly) that would reduce digital piracy – a current problem. This is especially important since many studies have suggested that individuals do not see piracy as a crime or an unethical issue. A better understanding of these factors that influence attitude toward digital piracy could prove to be essential in our understanding of this phenomenon and help us

combat digital piracy. An examination of the cognitive beliefs held by subjects, as well as the other variables studied in this research could further help in combating digital piracy; for example, attitude toward piracy could be altered. Some beliefs held by subjects include – digital media is overpriced and lack of fear of getting caught.

### *Digital media is overpriced*

The most salient belief within cognitive beliefs was that subjects believed that they could save money by pirating digital media. Another related and significant salient belief was that subjects believed that digital media is overpriced. There has been a move recently to lower the price of digital media to curb piracy. By lowering the prices, digital pirates will reexamine the cost of pirating versus buying and hopefully tilt the balance towards buying versus pirating (Cheng et al., 1997). Another avenue that might also be worthwhile pursuing is to better educate the public on why these prices should be the way they are (by explaining the different costs associated with making/promoting digital media). The RIAA (which has been leading the fight against music piracy) does have a section on its web site to explain these costs (<http://www.riaa.org/MD-US-7.cfm>).

### *No fear of getting caught*

Subjects also believed that they will not get caught while pirating digital material. This would obviously translate into lower deterrence towards pirating digital media (Gopal and Sanders, 1997). While there have been some cases of apprehending digital pirates in the news recently (<http://zdnet.com.com/2110-1105-838860.html>), these cases were targeted at professional groups that copy and spread pirated material all over the internet, and not the average digital pirate. Obviously, going after each individual pirate might not be feasible, other methods must be employed.

One approach would be to expand the media coverage on these digital piracy busts, and create new and tougher laws to combat against digital piracy. Another approach would include “smart

digital media” that would warn users about the consequences of pirating when it detects an attempt to copy the media (thus, serving as a deterrent towards piracy).

This study also showed that *significant others generally supported* the decision to pirate digital media. The subjective norms variable was the strongest variable that affected attitude (significant at the 0.000 level). This would imply that the “opinion of others” does matter (and is supportive) when it comes to pirating (also found in Eining and Christensen, 1991; Limayem et al., 1999; Simpson et al., 1994). To combat this, society has to be better informed about the problems associated to piracy; this would help in limiting the support of significant others.

Moreover, subjects did not regard the issue of *digital piracy itself as important* (perceived importance was found to be a significant predictor of attitude). If the society was informed about the implications of this practice (such as higher cost of media, people losing their jobs, and less motivation to invent new things), this could help in making this issue more important.

Subjects were generally *happy and excited* when pirating digital media (also a significant variable affecting attitude). It follows that if more people would be better informed about the hazards of piracy, this would also help in curbing that feeling of happiness and excitement.

Moral judgment, distress, and the sex of the individual were not found to be significant influencers of attitude toward digital piracy in this study. In general, these results could be a consequence of several factors, such as the sample used for this study. Moreover, some propose that variables such as opportunity may be important in explaining ethical beliefs. Clearly, more study is warranted as indicated later in this section.

Moral judgment also was not a significant variable in this study, which could be an artifact of the sample used. Since the sample was made of students (mostly of the same age, status), not much variation existed in the sample, which could have caused Moral Judgment to be insignificant. Perhaps, future studies should focus on this variable with a more diverse sample.

The sex of the subject was also not found to be a significant predictor of attitude in this study.

While females had a lower attitude towards digital piracy as expected, that difference was not statistically significant. Within the ethics literature, studies have reported inconsistent results regarding the influence of sex on ethical decision-making (Borkowski and Ugras, 1998; Dawson, 1997; Khazanchi, 1995; among others; Reiss and Mitra, 1998). Researchers argue that this might be an artifact of the situation itself (Banerjee et al., 1998), and that different ethical situations are affected by different variables (situational ethics) which might be the case here.

Distress, also not to be a significant predictor of attitude, can be an indication that subjects did not have any fears when pirating digital media (which was not unexpected as most people have no fear from a legal point of view). The average distress score was 2.75 (with 7 being the highest emotion of distress), while the average value for happiness and excitement was a high 6.21. It would be of interest to examine this variable when tougher laws are in effect or when laws are more strenuously enforced.

Several research implications have been identified based on the results of the study. These include the role of affect in determining attitude and behavior, inclusion of other variables including other personal variables, and a possible modification in the relationships suggested by the theory of planned behavior. As shown in this study, affective beliefs were important in determining attitude. According to the results of the study, affect was found to be a strong predictor of attitude. Previous studies in ethical decision-making have included few variables representing affect (Ford and Richardson, 1994) and should be included in future studies. Different types of affect should be classified and examined further in the literature (which of the different types of affect is more influential than others?). Also, research regarding affecting these feelings should be undertaken (what are the antecedents of feelings?).

Machiavellianism and age were found to be significant predictors of attitude. Previous research has used demographical variables to represent information about the subject. Future research should continue to examine the role of psychological characteristics (such as Machiavellianism), the five dimensions of personality (Digman, 1990), and

others as antecedents to ethical attitude and decision-making.

One of the interesting findings in this study was the strong relationship between subjective norms and attitude, which is consistent with previous studies that studied this relationship. Based on the results of this study (and others), further tests on the TPB should be accomplished to determine whether this link (between subjective norms and attitude) is appropriate and perhaps relevant to TPB.

As is the case with any research, different and interesting results from this study provide new directions for researchers. Future research directions are suggested within these three areas: study verification, ethical decision-making and affective research. Limitations of this study include the use of a student sample and the use of Cronbach alpha values of 0.7 as a lower limit for reliability measures. To verify the results of this study, research should be replicated with a larger and a possibly different sample. A different sample would be beneficial to determine if these results would differ across different populations. A more diverse sample might be appropriate, with different age groups, different cultures, and non-students as subjects.

Future research directions are also warranted in ethical decision making. One research direction would be to further explain and understand the relationship between ethical judgment and attitude. Are they the same? Does one cause the other? The relationship between ethical judgment, attitude, and intention needs to be studied. Another research venue would be to reexamine this model under other ethical situations (or general behavior). The model might be different under different ethical situations. Some variables might be more/less/not significant under different ethical scenarios (especially when the importance of the issue is considered). The importance of the issue should be included in future studies when studying specific issues or behaviors. Past behavior could also be considered. While it has been found to be the best predictor (although not explanatory in nature) of future behavior (Conner and Armitage, 1998), its relationship to other variables might be worth examining.

## Appendix A

### Study Questionnaire

*{All rights are reserved. Permission is required from the authors for use of this questionnaire/instrument in part or in total}*

**Digital Piracy Study** *{All rights are reserved. Permission is required from the authors for use of this questionnaire/instrument in part or in total}*

**Thank you for participating in this study. This questionnaire should take about 20–30 min to complete. Please read the following instructions before continuing with the survey.**

**Description:** The purpose of this research is to examine digital piracy behavior.

**Digital piracy** is defined as:

The illegal copying and/or downloading of copyrighted **software** (such as Microsoft Windows, Microsoft Office, and other copyrighted programs), **music, video, or other digital material** (MP3s, Hollywood movies, and digital audio books among others)

**Benefits and Risks:** Your participation in this study will help contribute to the understanding of digital piracy behavior (i.e. why do individuals pirate digital material). There are no risks associated with this research as no penalties are assigned to your responses.

**Voluntary Participation:** Your participation in this project is voluntary.

**Confidentiality:** All information will be recorded anonymously. **No individual respondents will be identified, this is an anonymous questionnaire.**

**Procedure:** The instrument will be administered to university students by your instructor and the results collected. Students will be asked to return the questionnaire.

**Informed Consent:** I have read the above description, including the nature and purpose of the study, the benefits, confidentiality statement, and the right to withdraw from the study at any time. The investigator/instructor has answered my questions regarding the study, and I believe I understand what is involved. My participation indicates that I freely agree to participate in this study.









**For rest of the questionnaire, please read the paragraph on top of each page and answer the questions related to the paragraph**

**Escaped Prisoner**

A man had been sentenced to prison for 10 years. After one year, however, he escaped from prison, moved to a new area of the country, and took on the name of Thompson. For 8 years he worked hard, and gradually he saved enough money to buy his own business. He was fair to his customers, gave his employees top wages, and gave most of his own profits to charity. Then one day, Mrs. Jones, an old neighbor, recognized him as the man who escaped from prison 8 years before, and whom the police had been looking for.

**Should Mrs. Jones report Mr. Thompson to the police and have him sent back to prison? (Check one)**

\_\_\_\_\_ Should report him      \_\_\_\_\_ Can't decide      \_\_\_\_\_ Should not report him

Given your decision, mark the degree of **importance** for the following statements in making that decision:

	Great	Much	Some	Little	None
1. Hasn't Mr. Thompson been good enough for such a long time to prove he isn't a bad person?					
2. Every time someone escapes punishment for a crime, doesn't that just encourage more crime?					
3. Wouldn't we be better off without prisons and the oppression of our legal system?					
4. Has Mr. Thompson really paid his debt to society?					
5. Would society be failing Mr. Thompson?					
6. What benefits would prisons be for a charitable man?					
7. How could anyone be so cruel and heartless as to send Mr. Thompson to prison?					
8. Would it be fair to all the prisoners who had to serve out their full sentences if Mr. Thompson was let off?					
9. Was Mrs. Jones a good friend of Mr. Thompson?					
10. Wouldn't it be a citizen's duty to report any escaped criminal, regardless of the circumstances?					
11. How would the will of the people and the public good best be served?					
12. Would going to prison do any good to Mr. Thompson or protect anybody?					

From the list of questions above, select the four most important and enter their question number below:

Most Important	
Second Most Important	
Third Most Important	
Fourth Most Important	

**Heinz and the drug**

In Europe, a woman was near death from a special kind of cancer. There was one drug that doctors thought might save her. It was a form of radium that a druggist in the same town has recently discovered. The drug was expensive to make, but the druggist was charging ten times what the drug cost to make. He paid \$200 for the radium and charged \$2000 for a small dose of the drug. The sick woman’s husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about \$1000, which is half of what it cost. He told the druggist that his wife was dying and asked him to sell it cheaper or let him pay later. But the druggist said, “No, I discovered the drug and I’m going to make money from it.” So Heinz got desperate and began to think about breaking into the man’s store to steal the drug for his wife.

**Should Heinz steal the drug? (Check one)**

\_\_\_ Should Steal it                      \_\_\_ Can’t Decide                      \_\_\_ Should not steal it

Given your decision, mark the degree of **importance** for the following statements in making that decision:

	Great	Much	Some	Little	None
1. Whether a community’s laws are going to be upheld					
2. Isn’t it only natural for a loving husband to care so much for his wife that he’d steal?					
3. Is Heinz willing to risk getting shot as a burglar or going to jail for the chance that stealing the drug might help?					
4. Whether Heinz is a professional wrestler or has considerable influence with professional wrestlers					
5. Whether Heinz is stealing for himself or doing this solely to help someone else					
6. Whether the druggist’s rights to his invention have to be respected					
7. Whether the essence of living is more encompassing than the termination of dying, socially and individually					
8. What values are going to be the basis for governing how people act towards each other					
9. Whether the druggist is going to be allowed to hide behind a worthless law which only protects the rich anyhow					
10. Whether the law in this case is getting in the way of the most basic claim of any member of society					
11. Whether the druggist deserves to be robbed for being so greedy and cruel					
12. Would stealing in such a case bring about more total good for the whole society or not					

From the list of questions above, select the four most important and enter their question number below:

Most Important	
Second Most Important	
Third Most Important	
Fourth Most Important	

**The Doctor's Dilemma**

A lady was dying of cancer which could not be cured and she had only about six months to live. She was in terrible pain, but she was so weak that a good dose of pain-killer like morphine would make her die sooner. She was delirious and almost crazy with pain, and in her calm periods, she would ask the doctor to give her enough morphine to kill her. She said she couldn't stand the pain and that she was going to die in a few months anyway.

**What should the doctor do? (Check one)**

\_\_\_\_\_ He should give the lady the overdose that will make her die      \_\_\_ Can't decide      \_\_\_ Should not give the overdose

Given your decision, mark the degree of **importance** for the following statements in making that decision:

	Great	Much	Some	Little	None
1. Whether the woman's family is in favor of giving her the overdose or not.					
2. Is the doctor obligated by the same laws as everybody else if giving her an overdose will kill her.					
3. Whether people would be much better off without society regimenting their lives and even their deaths.					
4. Whether the doctor could make it appear like an accident.					
5. Does the state have the right to force continued existence on those who don't want to live.					
6. What is the value of death prior to society's perspective on personal values.					
7. Whether the doctor has sympathy for the woman's suffering or cares more about what society might think.					
8. Is helping to end another's life ever a responsible act of cooperation.					
9. Whether only God should decide when a person's life should end.					
10. What values the doctor has set for himself in his own personal code of behavior.					
11. Can society afford to let everybody end their lives when they want to.					
12. Can society allow suicides or mercy killing and still protect the lives of individuals who want to live.					

From the list of questions above, select the four most important and enter their question number below:

Most Important	
Second Most Important	
Third Most Important	
Fourth Most Important	

## Appendix B

## Correlation Table

		Sex	Age	P-Index	Attitude	Cognitive	Happiness	Distress	Mach	Importance	Subjective Norms-
Sex	Correlation	1	-.021	.087	-.085	-.088	-.122	.128	-.160	.043	.088
	Sig.	.	.726	.147	.158	.143	.041	.032	.007	.476	.140
Age	Correlation	-.021	1	.084	-.341	-.138	-.212	.212	-.128	.190	.321
	Sig.	.726	.	.160	.000	.021	.000	.000	.033	.001	.000
P-Index	Correlation	.087	.084	1	-.091	-.061	-.092	-.032	-.071	.033	-.006
	Sig.	.147	.160	.	.131	.313	.125	.598	.234	.578	.922
Attitude	Correlation	-.085	.341	-.091	1	.310	.429	-.226	.245	-.268	-.527
	Sig.	.158	.000	.131	.	.000	.000	.000	.000	.000	.000
Cognitive	Correlation	-.088	.138	-.061	.310	1	.298	-.213	.151	-.027	-.297
	Sig.	.143	.021	.313	.000	.	.000	.000	.011	.655	.000
Happiness	Correlation	-.122	.212	-.092	.429	.298	1	.105	.178	.048	-.235
	Sig.	.041	.000	.125	.000	.000	.	.080	.003	.422	.000
Distress	Correlation	.128	.212	-.032	-.226	-.213	.105	1	-.024	.289	.384
	Sig.	.032	.000	.598	.000	.000	.080	.	.686	.000	.000
Mach	Correlation	-.160	.128	-.071	.245	.151	.178	-.024	1	-.132	-.167
	Sig.	.007	.033	.234	.000	.011	.003	.686	.	.027	.005
Importance	Correlation	.043	.190	.033	-.268	-.027	.048	.289	-.132	1	.238
	Sig.	.476	.001	.578	.000	.655	.422	.000	.027	.	.000
Subjective Norms-	Correlation	.088	.321	-.006	-.527	-.297	-.235	.384	-.167	.238	1
	Sig.	.140	.000	.922	.000	.000	.000	.000	.005	.000	.

## Notes

<sup>1</sup> Much research has used students as subjects. These subjects have been assumed to be suitable surrogates for business managers and decision makers and results should be generally applicable to actual business managers. This is especially the case when researchers are interested in the ethical decision-making process. Student samples can be used without a major threat to generalizability [1990: 'Methods in Business Ethics', *Journal of Business Ethics* 9(6), 463]. Moreover, Wyld and Jones indicate that when nontraditional students were used as subjects and compared to managers, there was no difference in the results. [1997: 'An Empirical Look at the Use of Managerial and Non-Managerial Student Subjects for Inquiries into Ethical Management', *Management Research News*, 20(9), 18–30].

<sup>2</sup> To this end, an examination of normality, homogeneity of variance, and multicollinearity was accomplished as well as an outlier analysis. Using the

Shapiro–Wilk normality test results ( $p$ -values of 0.3) we fail to reject the hypothesis that the residuals are not normally distributed, and conclude that the normality assumption has been met. The Breusch–Pagan Breusch and Pagan (1980). "The LM Test and Its Applications to Model Specification in Econometrics." *Review of Economic Studies* (January): 153–177 test was used to test for homogeneity of variance. Using the results of the analysis,  $p$ -value for the test was 0.83, the null hypothesis is rejected and we conclude that the error variances are not statistically different. Thus, the data collected meet the assumption of homogeneity of variance. Variance Inflation Factors (VIF) were used to test for multicollinearity. VIF measure how much of the variance in the predicted variables is inflated because of correlations between the variables. VIF values have been commonly used as a method to detect multicollinearity Pedhauzr, E. and L. Schmelkin (1991). *Measurement, Design, and Analysis: An Integrated Approach*. Hillsdale, NJ., Lawrence Erlbaum Associates,

Publishers. An examination of VIF values indicates that none of the variables had a high VIF value (the highest VIF value was 1.42). According to Neter et al. (1985). *Applied Linear Statistical Models*. Homewood, IL, Irwin., as a rule of thumb, VIF values of 10 or more are an indication of multicollinearity, and VIF values between 5 and 10 are considered suspect with regard to presence of multicollinearity. This would indicate that the attitude model is not affected by multicollinearity. According to Tabachnick and Fidell Tabachnick, B. and L. Fidell (1996). *Using Multivariate Statistics*. New York, Hyper Collins Publishers., outliers should be detected, and possibly deleted because of their statistical influence on the model. The standardized residuals for data points that fall outside 3 standard deviations were examined Tabachnick, B. and L. Fidell (1996). *Using Multivariate Statistics*. New York, Hyper Collins Publishers. Three observations (outliers) were omitted from this analysis, resulting in an overall number of 282 observations in the sample.

## References

- Eighth Annual BSA Global Software Piracy Study. Washington DC, Business Software Alliance, 2003.
- Ajzen, I.: 1985, 'From Intentions to Behavior: A Theory of Planned Behavior', in J. Kuhl & J. Beckman (eds.), *Action-Control: From Cognition to Behavior* (Springer, Heidelberg), pp. 11–39.
- Ajzen, I.: 1991, 'The Theory of Planned Behavior', *Organizational Behavior and Human Decision Processes* **50**(1), 179–211.
- Ajzen, I.: 2001, 'Nature and Operations of Attitudes', *Annual Review of Psychology* **52**, 27–58.
- Allport, G.: 1935, 'Attitudes', in C. Murchison (ed.), *Handbook of Social Psychology*. (Clark University Press, Worcester, MA), pp. 798–844.
- Auerbach, J. A. and J. C. Welsh: 1994, *Aging and Competition: Rebuilding the U.S. workforce*. National Council on the Aging–National Planning Association Symposium. Washington DC, ISBN: 0890681287.
- Bagozzi, R. and L. Phillips.: 1991, 'Assessing Construct Validity in Organizational Research', *Administrative Sciences Quarterly* **36**, 421–458.
- Banerjee, D. and T. P. Cronan: 1998, 'Modeling IT Ethics: A Study in Situational Ethics', *MIS Quarterly* **22**(1), 31–60.
- Barger, R. N., W. N. Kubitschek and J. C. Barger: 1998, *Do Philosophical Tendencies Correlate with Personality Types?* Annual Meeting of the American Educational Research Association, San Diego, CA, April 13–17.
- Bass, K. and T. Barnett: 1999, 'Individual Difference Variables, Ethical Judgments and Ethical Behavioral Intentions', *Business Ethics Quarterly* **9**(2), 183–205.
- Beck, L. and I. Ajzen: 1991, 'Predicting Dishonest Actions Using the Theory of Planned Behavior', *Journal of Research in Personality* **25**(3), 285–301.
- Bhattacharjee, S. and R. Gopal: 2003, 'Digital Music and Online Sharing: Software Piracy 2.0?', *Communication of the ACM* **46**(7), 107–111.
- Bodur, H. and D. Brinberg: 2000, 'Belief, Affect, and Attitude: Alternative Models of the Determinants of Attitude', *Journal of Consumer Psychology* **9**(1), 17–28.
- Bommer, M. and C. Gratto.: 1987, 'A Behavioral Model of Ethical and Unethical Decision Making', *Journal of Business Ethics* **6**(4), 265–280.
- Borkowski, S. and Y. Ugras: 1998, 'Business Students and Ethics: a Meta-Analysis', *Journal of Business Ethics* **17**, 1117–1127.
- Breusch, T. and A. Pagan: 1980, 'The LM Test and Its Applications to Model Specification in Econometrics', *Review of Economic Studies* (January), 153–177.
- Chang, M.: 1998, 'Predicting Unethical Behavior: A Comparison of the Theory of Reasoned Action and the Theory of Planned Behavior', *Journal of Business Ethics* **17**, 1825–1834.
- Cheng, H. and R. Sims: 1997, 'To Purchase or to Pirate Software: An Empirical Study', *Journal of Management Information Systems* **4**, 49–60.
- Christensen, A. and M. Fining: 1991, 'Factors Influencing Software Piracy: Implications for Accountants', *Journal of Information Systems* **5**(1), 67–50.
- Christie, R. and F. Geis: 1970, *Studies in Machiavellianism* (Academic Press, New York).
- Conner, K. and R. Rumlet: 1991, 'Software Piracy: An Analysis of Protection Strategies', *Management Science* **37**(2), 125–139.
- Conner, M. and C. Armitage: 1998, 'Extending the Theory of Planned Behavior: A Review and Avenues for Further Research', *Journal of Applied Social Psychology* **28**(15), 1429–1464.
- Coombe, K. and L. Newman: 1997, 'Ethics in Early Childhood Field Experiences', *Journal of Australian Research in Early Childhood Education* **1**, 1–9.
- Dawson, L.: 1997, 'Ethical Differences Between Men and Women in The Sales Profession', *Journal of Business Ethics* **16**, 1143–1152.
- Digman, J.: 1990, 'Personality Structure: An Emergence of the Five-Factor Model', *The Annual Review of Psychology* **41**, 417–440.
- Dubinsky, A. and B. Loken: 1989, 'Analyzing Ethical Decision Making in Marketing', *Journal of Business Research* **19**, 83–107.

- Eining, M. and A. Christensen: 1991, 'A Psycho-Social Model of Software Piracy: The Development and Test of a Model', in R. DeJorie, G. Fowler and D. Paradice (ed), *Ethical Issues in Information Systems* (Boyd and Fraser, Boston, MA).
- Fishbein, M. and I. Ajzen: 1975, *Attitude, Intention, and Behavior: An Introduction to Theory and Research* (Addison-Wesley, Reading, MA).
- Fishbein, M. and S. Middlestadt: 1995, 'Noncognitive Effects on Attitude Formation and Change: Fact or Artifact?', *Journal of Consumer Psychology* **4**(2), 181–202.
- Flannery, B. and D. May: 2000, 'Environmental Ethical Decision Making in the U.S. Metal-Finishing Industry', *Academy of Management Journal* **43**(4), 642–662.
- Ford, R. and W. Richardson: 1994, 'Ethical Decision Making: A Review of the Empirical Literature', *Journal of Business Ethics* **13**(March), 205.
- Glass, R. and W. Wood: 1996, 'Situational Determinants of Software Piracy: An Equity Theory Perspective', *Journal of Business Ethics* **15**, 1189–1198.
- Gopal, R. and L. Sanders: 1997, 'Preventive and Deterrent Controls for Software Piracy', *Journal of Management Information Systems* **13**(4), 29–47.
- Haddock, G. and M. Zanna: 1998, 'Assessing the Impact of Affective and Cognitive Information in Predicting Attitudes toward Capital Punishment', *Law and Human Behavior* **22**(3), 325–339.
- Hegarty, W. H. and H. P. Sim, Jr.: 1978, 'Some Determinants of Unethical Decision Behavior: An Experiment', *Journal of Applied Psychology* **63**(August), 451.
- Hegarty, W. H. and H. P. Sims, Jr.: 1979, 'Organizational Philosophy, Policies, and Objectives Related to Unethical Decision Behavior: A Laboratory Experiment', *Journal of Applied Psychology* **64**(June), 331.
- Holbrook, M. and R. Batra: 1987, 'Assessing the Role of Emotions as Mediators of Consumer Responses to Advertising', *Journal of Consumer Research* **14**, 404–420.
- Hunt, S. and S. Vitell: 1986, 'A General Theory of Marketing Ethics', *Journal of Micromarketing* **6**, 5–16.
- Im, J. and P. Van Epps: 1991, 'Software Piracy and Software Security in Business Schools: An Ethical Perspective', *The DATABASE for Advances in Information Systems* (Summer), 15–21.
- Jones, G. and M. Kavanagh: 1996, 'An Experimental Examination of the Effects of individual and situational fact that is on Unethical Behavioral Intentions in the Workplace', *Journal of Business Ethics* **15**, 511–523.
- Kempf, D.: 1999, 'Attitude Formation from Product Trials: Distinct Roles of Cognition and Affect for Hedonic and Functional Products', *Psychology and Marketing* **16**(1), 35–50.
- Khazanchi, D.: 1995, 'Unethical Behavior in Information-Systems – The Gender Factor', *Journal of Business Ethics* **14**(9), 741–749.
- Kohlberg, L.: 1969, 'Stages and Sequence: The Cognitive-Developmental Approach to Socialization', in D. Gosling (ed), *Handbook of Socialization Theory and Research* (Rand McNally, Chicago).
- Kreie, J. and P. Cronan: 1999a, 'Copyright, Piracy, Privacy, and Security Issues: Acceptable or Unacceptable Actions for End Users?', *Journal of End User Computing* **11**(2), 13–21.
- Kreie, J. and P. Cronan: 1999b, 'How Men and Women View Ethics', *Communications of the ACM* **41**(9), 70–76.
- Kreie, J. and P. Cronan: 2000, 'Making Ethical Decisions', *Communications of the ACM* **43**(12), 66–72.
- Kuo, F. and M. Hsu: 2001, 'Development and Validation of Ethical Computer Self-Efficacy Measure: The Case of Softlifting', *Journal of Business Ethics* **32**, 299–315.
- Lau, E.: 2003, 'An Empirical Study of Software Piracy', *Business Ethics* **12**(3), 233–245.
- Leonard, L. and T. P. Cronan: 2001, 'Illegal, Inappropriate, and Unethical Behavior in an Information Technology Contexts: A Study to explain Influence', *Journal of the Association for Information Systems* **1**(12), 1–31.
- Limayem, M. and M. Khalifa, et al.: 1999, 'Factors Motivating Software Piracy: A Longitudinal Study', *Proceedings of the International Conference on Information Systems*, pp. 124–131.
- Loch, K. and S. Conger: 1996, 'Evaluating Ethical Decision Making and Computer Use', *Communications of the ACM* **39**(7), 74–83.
- Madden, T. and P. Ellen.: 1992, 'A Comparison of the Theory of Planned Behavior and the Theory of Reasoned Action', *Personality and Social Psychology Bulletin* **18**, 3–9.
- Moseley, O. and R. Whitis: 1995, 'Preventing Software Piracy', *Management Accounting* (December), 42–47.
- Neter, J. and W. Wasserman.: 1985, *Applied Linear Statistical Models* (Irwin, Homewood, IL).
- Nunnally, J.: 1978, *Psychometric Theory* (McGraw-Hill, NY).
- O'Leary-Kelly, S. and R. Vokura: 1998, 'The Empirical Assessment of Construct Validity', *Journal of Operations Management* **16**, 387–405.
- Olson, J. and M. Zanna: 1993, 'Attitudes and Attitude Change', *Annual Review of Psychology* **44**, 117–154.
- Peace, A. and D. Gallette.: 2003, 'Software Piracy in the Workplace: A Model and Empirical Test', *Journal of Management Information Systems* **20**(1), 153–177.

- Pedhauzr, E. and L. Schmelkin: 1991, *Measurement, Design, and Analysis: An Integrated Approach* (Lawrence Erlbaum Associates, Publishers, Hillsdale, NJ).
- Petty, R. and D. Wegener.: 1997, 'Attitudes and Attitude Change', *Annual Review of Psychology* **48**, 609–647.
- Randall, D. and A. Gibson: 1991, 'Ethical Decision Making in the Medical Profession: An Application of the Theory of Planned Behavior', *Journal of Business Ethics* **10**, 111–122.
- Reid, R. and J. Thompson: 1992, 'Knowledge and Attitudes of Management Students Toward Software Piracy', *Journal of Computer Information Systems* **33**, 46–51.
- Reiss, M. and K. Mitra: 1998, 'The Effects Of Individual Difference Factors On The Acceptability Of Ethical And Unethical Workplace Behaviors', *Journal of Business Ethics* **17**(14), 1581–1593.
- Report 2003, Thoughts On The Digital Future Of Movies, The Threat Of Piracy, The Hope Of Redemption. Encino, CA, Motion Picture Association of America.
- Rest, J.: 1986, *Moral Development: Advances in Research and Theory* (Praeger, New York).
- Rest, J. and D. Narvaez: 1999a, *Postconventional Moral Thinking: A Neo-Kohlbergian Approach* (Lawrence Erlbaum, Mahwan, NJ).
- Rest, J. and D. Narvaez: 1999b, 'DIT2: Devising and Testing a Revised Instrument of Moral Judgment', *Journal of Educational Psychology* **91**(4), 644–659.
- Robertson, C. and W. Crittenden: 2002, 'Situational Ethics Across Borders: A Multicultural Examination', *Journal of Business Ethics* **38**(4), 327–339.
- Robin, D. and R. Reidenbach: 1996, 'The Perceived Importance of an Ethical Issues as an Influence on the Ethical Decision-Making of Ad Managers', *Journal of Business Research* **35**, 17–28.
- Shepherd, G. and D. O'Keefe: 1984, 'Separability of Attitudinal and Normative Influences on Behavioral Intentions in the Fishbein–Ajzen Model', *The Journal of Social Psychology* **122**, 287–288.
- Shimp, T. A. and A. Kavas: 1984, 'The Theory of Reasoned Action Applied to Coupon Usage', *Journal of Consumer Research* **11**(December), 795.
- Simpson, P. and D. Banerjee: 1994, 'Softlifting: A Model of Motivating Factors', *Journal of Business Ethics* **13**, 431–438.
- Sims, R. and H. Cheng: 1996, 'Toward a Profile of Student Software Pirates', *Journal of Business Ethics* **15**, 839–849.
- Singhapakdi, A. and S. J. Vitell: 1992, 'Marketing Ethics: Sales Professionals Versus Other Marketing Professionals', *The Journal of Personal Selling & Sales Management* **12**(Spring), 27.
- Solomon, S. and J. O'Brien: 1990, 'The Effect of Demographic Factors on Attitudes Toward Software Piracy', *The Journal of Computer Information Systems* **30**(3), 45–45.
- Tabachnick, B. and L. Fidell: 1996, *Using Multivariate Statistics* (Hyper Collins Publishers, New York).
- Tan, B.: 2002, 'Understanding Consumer Ethical Decision Making with Respect to Purchase of Pirated Software', *The Journal of Consumer Marketing* **19**(2/3), 96–111.
- Thong, J. and C. Yap: 1998, 'Testing an Ethical Decision-Making Theory: The Case of Softlifting', *Journal of Management Information Systems* **15**(1), 213–237.
- Trafimow, D.: 1996, 'The Importance of Attitudes in the Prediction of College Students' Intention to Drink', *Journal of Applied Social Psychology* **26**(24), 2167–2188.
- Trafimow, D. and K. Finlay: 1996, 'The Importance of Subjective Norms for a Minority of People: Between-subjects and Within-subjects Analyses', *Personality & Social Psychology Bulletin* **22**, 820–829.
- Trafimow, D. and P. Sheeran: 1998, 'Some Tests of the Distinction between Cognitive and Affective Beliefs', *Journal of Experimental Social Psychology* **34**, 378–397.
- Triandis, C.: 1980, 'Values, Attitudes and Interpersonal Behavior', *Nebraska Symposium on Motivation, 1979: Beliefs, Attitudes, and Values* (University of Nebraska Press, Lincoln, NE) pp. 159–295.
- Vallerand, R. J. and L. G. Pelletier: 1992, 'Ajzen and Fishbein's Theory of Reasoned Action as Applied to Moral Behavior: A Confirmatory Analysis', *Journal of Personality and Social Psychology* **62**(January), 98.
- Verplanken, B. and G. Hofstee: 1998, 'Accessibility of Affective Versus Cognitive Components of Attitude', *European Journal of Social Psychology* **28**, 23–35.
- Wagner, S. and G. Sanders: 2001, 'Considerations in Ethical Decision-Making and Software Piracy', *Journal of Business Ethics* **29**(1/2), 161–167.

Sulaiman Al-Rafee,  
College of Business Administration,  
Kuwait University,  
P.O. Box 5486 Safat, 13055, Kuwait  
E-mail: sulaiman@cba.edu.kw

Timothy Paul Cronan,  
Walton College of Business 204,  
University of Arkansas,  
Fayetteville, AR 72701.  
E-mail: cronan@uark.edu