Ethical Decision-Making, Religious Beliefs and Software Piracy

Lu-Ping Liu* and Wen-Chang Fang**

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Software piracy has become one of the major social and business problems in our society as the information technology era came to the fore. IT companies and software developers lost huge sums of money due to software piracy. Most people would not link software piracy, commercial morality and religious beliefs together. However, management researchers propose that the moral tendency of an individual may affect the respective person’s ethical decision-making towards copyright infringements, specifically software piracy. Thus, this paper attempts to identify the cause and effect relationship between morality and ethical decision-making.

This research examines the relationship between an individual’s religious beliefs and ethical decision-making with regard to software piracy in a scenario-based vignette. The structural equation model (SEM) is used to identify this cause and effect relationship. The research findings suggest that an individual’s religious beliefs are pertinent to the ethical decision-making process with specific reference to software piracy.

Keywords: software piracy, ethical decision-making, religious beliefs

1. Introduction

Due to the advanced and prosperous development of the information technology field, our lifestyle and social structure have been reconstructed completely, which in return have caused our strong dependence on information technology. According to the United Daily News’ report on May 10, 2001, the Information Product Anti-Piracy Alliance (IPAPA) of the R.O.C. assisted the police to expose and eradicate pirated software in nearly 200 cases island-wide.

Moreover, the Business Software Alliance (BSA) formed by Taiwanese software manufacturers, pointed out that the volume of pirated software has increased for the first time in the past five years, while among the software used by global enterprises, a staggering 37 percent were counterfeits. This...
report also suggested that piracy problems have caused a loss of NTD 4 billion by software companies in the Asian Pacific region (The Economic Daily News on May 22, 2001). The loss was ranked as the highest in the world. From the above data, it is clear that the prevalence of software piracy caused enormous financial losses. If the above problem is not addressed, both the software developers and the information technology intellectual property development program will be significantly affected. In order to eliminate the unethical conduct of software pirates, we need to understand how this unethical behavior in the decision-making process affects individuals, so that the ultimate solution for software piracy can be found.

1.1 Objective

Many scholars proposed different ethical decision-making models to explain the cause and decision-making process of unethical behavior. One of the most significant ethical decision-making models in business research is by Hunt and Vitell [17], which focuses on the perceptions of marketers toward situational behavior in complex scenarios, including the relationship between ethical evaluation, ethical judgment, and behavioral intention. Reidenbach and Robin [28] and Robin et al. [30] studied evaluation and intention and confirmed the relationships found by Mayo and Marks and Hunt and Vasquez-Parraga. Harrington [15] studied the relationship between judgments and intent. Using computer viruses as the issue presented to the subjects, Harrington found significant direct effects of the impact of social consensus, rule orientation, and denial of responsibility on ethical judgments and intent.

In the research of theoretical intention models, the theory of reasoned action (TRA) proposed that behavior is affected by intention, and that intention is influenced by further factors. Therefore, many studies in ethical behavior used intention as the causing variable in actual behavior and, in addition, as the foundation of the behavioral model. These are the so-called intention-based models which were applied in this study.

The objective of this paper is to study the relationship between religious beliefs and the ethical decision-making process of individual computer users faced with ethical and unethical scenarios.

The outline of this paper is as follows: literature review of research in ethical behavior; theoretical models and hypotheses; research design and empirical results; conclusions.
2. Literature Review

2.1 Decision-Making Process of Ethical Behavior:

Jones [19] proposed that the issue-contingent decision-making model explains the decision-making process in ethical behavior. He divided the decision-making process into four stages: recognizing moral issues; making moral judgments; establishing moral intent and taking moral actions. Jones’ model combined the decision-making models of Rest [29] and Ferrell et al. [9]. The model proposed that an individual’s moral intent is the main determining factor in making moral decisions. Therefore, moral intent is used in many studies as the major variable to research moral behavior [4]. The TRA model proposes that intention is the causing factor of behavior, and behavioral intention is affected by subjective norms pertaining to behavior and/or attitudes towards the behavior.

2.2 Individual characteristics

Prior research has sought to identify individual characteristics, such as age, gender and education, that influences ethical decision-making [5,11,21,27,29,34,37] and software piracy [13,14,26,33,35]. According to Ford and Richardson [10], the relationship between personal attributes and decision-making behavior was found in some studies but not in others.

Loch and Conger [22] developed a modified Theory of Reasoned Action and proposed the addition of individual characteristics, specifically gender, technology and the consideration of ethical situations, to the traditional Theory of Reasoned Action. This research found that TRA couldn’t fully explain the unethical behavior of computer users.

Social norms are a major component of the TRA. While the study of Loch and Conger limits social norms to organizational norms or organizational culture, Rest's study is an attempt to measure the degree of individual rights and the use of ethical principals versus the degree of social influence (such as obedience and social accord [21] across all situations. The results of Loch and Conger's study revealed that the original components of the TRA (attitudes and social norms) affected intentions to perform computing acts. The modifications to the model were applicable for specific computer users only but are relatively irrelevant to general ethical decision making for common computer users situations.

2.3 Software piracy

Software piracy is defined as the unauthorized copying of an organization's internally developed software or the illegal duplication of
commercially available software in order to avoid fees [36]. Software piracy behavior has been studied from a variety of perspectives such as a reasoned action theory perspective [39], a planned behavior theory and expected utility theory perspective [26], and an equity theory perspective [12]. Research has also begun on investigating whether certain types of software piracy acts are ethical or unethical [15,18,31,35].

3. Methodology

3.1 Research model and development of hypothesis

While portions of ethical decision making models have been studied in prior research, it appears that no one has yet attempted to study religion and its concurrent relationship with the stages of an ethical decision making model. The study of a general ethical decision making model may reveal the characteristics responsible for the decision to pirate software. Ethical decision making models are comprised of cognitive and moral development criteria that are used to evaluate ethical issues in an effort to make an ethical judgment about this issue.

A general theoretical model of ethical decision-making has identified five stages in the ethical decision-making process: awareness, cognition, evaluation, determination and action. This study investigates the relationship between an individual’s perception of religion and a theoretical ethical decision making process (Figure 1) that an individual uses when evaluating ethical or unethical situations [38].

The presented theoretical model illustrates the stages that an individual passes through in determining a course of action when confronted with an ethical issue. An individual is considered to be an active agent within the context of their social, economic and organizational environments. In an effort to study the primary stages of the decision making process with limited impact from environmental and personal changes, the research model used in this study focuses on the cognition, awareness, evaluation, determination, and action stages at a specific point in time (cross-section).

Individual characteristics, such as religion, and the ethical issue under consideration are expected to affect the ethical evaluation that an individual goes through, which is based on their underlying ethical philosophies and cognition (level of moral development). The evaluation stage involves an individual evaluating or determining the rightness or wrongness of aspects of a particular issue. The individual considers the aspects or alternatives of the issue such as whether he deems them to be just or unjust, acceptable to
himself or to others, conforming to the norms of society, government, etc. Ethical evaluations result in a judgment regarding the ethical issue and also impact the intended actions of the individual. An ethical judgment determines whether an action is ethical or not. An individual's intention determines whether (s)he will engage in an action presented to them as an outcome to an ethical situation. Resulting behavior is dependent upon behavioral intention.

Several different ethical issues were used to determine whether the propensity to pirate software is based on similar characteristics to those used to make decisions regarding other general ethical issues. The ethical issue of software piracy was used to provide a consistent ethical issue for evaluation of each stage of the decision making process to confirm the relationships within the model. Specific unethical scenarios were used and described. Respondents were asked to evaluate issues in regard to their attitudes about

Figure 1 The research model
the issue and their beliefs regarding the actions that were taken in the scenario. In the mean time, respondents were asked to evaluate ethical and unethical scenarios in order to determine the relationship between software piracy and behavior intention.

The hypothesis assumed that the an individual’s degree of religiousness will have an effect on the ethical decision making model and ethical behavior. Specifically, it was hypothesized that individuals who consider themselves as religious will evaluate unethical situations as unfair and unethical, and that they would indicate an intention not to behave unethically and will report a lower level of unethical behavior. The hypothesis was expected to hold true for software piracy issues, in addition to general ethical issues.

3.2 Research Design

(1) Measures

The variables of this study included: religious beliefs, moral evaluation, ethical judgment and behavioral intention.

Religious beliefs were measured by a single-item graded on a 7-point scale (1= very sincere religious beliefs, 7= no belief in religion).

Moral evaluation was assessed by the individual’s appraisal of the consequence of his behavior [2]. It was measured by certain indicator variables: foolish/ wise, wrong/ right, advantageous/ disadvantageous, all of which were rated on a 7-point scale. The measurement scores indicate the extent to which the user would benefit from conduct favoring software piracy. The higher the score is, the more favorable the outcome was perceived by the users.

Ethical judgments were measured after the respondents have read different scenarios on software piracy. A sample item is: ‘When confronted by a similar situation, will you exhibit the same behavior again? (1= most likely, 7= least likely). A higher score in ethical judgment implies that the respondent was less likely to favor software piracy.

Behavioral intention refers to the degree to which the respondent intends to pirate the software [2]. Every respondent had to rate the following two items respectively after reading the case study on software piracy: ‘When confronted by a similar situation, will you follow the same conduct?’, and ‘When confronted by a similar situation, would you try to behave that way again? (1= most likely, 7= least likely). A higher score in this indicates that the respondent is more likely to pirate software.

In the area of morality information, the researcher usually adopts the
investigation of “behavior of intention” instead of “behavior of software piracy” since the behavior of software piracy is not easy to be inspected and found [4,8,15,22,32].

The interviewee is often reluctant to speak of attitudes towards “software piracy” during the investigation process. It is not easy for a respondent to determine whether the assessor has an inclination to pirate software or not because of a dominating a testing environment. The investigation methodology of scenario-based vignettes is often used in the investigation of computer crime or moral behavior. The advantage of scenario-based vignettes is in providing a relaxed environment, keeping the respondent reflecting on his decisive behavior like in a practical scenario [15]. In addition, the investigation also shows that many respondents have the tendency to match with the investigator sedulously during the process of investigation, which causes the outcome of the investigation to be biased. Using the investigation methodology of scenario-based vignettes can minimize this from happening. Based on the above reason, this research will use the software piracy scenario (adapted from Anderson, et al, [1]) that the respondent will read through the scenario and respond to the questionnaire by imaging he (or she) is the character in it.

(2) Data collection

The questionnaire had been distributed through Internet on-line, collecting the basic information of users, and then proceeding through randomly selected ones. The reason for choosing the on-line method is the special characteristics of web users who are expected to be more familiar with downloading software from the Internet, because this act is usually related to software piracy. The questionnaire was published on a web page especially designed for this research. Providing exquisite wallpaper as a free gift to respondents, made joining the web questionnaire more attractive. The web infrastructure and the questionnaire were set up and for data processing the Front Page 2000 tool was used. Win2000 plus IIS was utilized to build up a web server and an on-line questionnaire system (http://203.68.134.5/) and data was stored through Access 2000. The web user found it very easy to fill out the questionnaire through this system.

After the completion of the web questionnaire, several students of the Graduate Institute of Business Administration in National Taipei University used a different web browser, in a different time slot, but simultaneously with multiple on-line users to test and to ensure the reliability and performance of the system in different web browsers. In addition the time used for completing the questionnaire was also measured. From the data collected, the
perceptions and the thoughts of most web users on software piracy can be better understood. The only limitation is that the result may not be able to represent and reflect the perceptions of Internet users if the sample size is too small and sample distribution is not balanced.

This research was distributed to Internet users island-wide, which included students, IT personnel, and the non-IT related working people.

(3) Data Analysis

This study used the Structural Equation Model (SEM) for data analysis in order to explain the causal relationship between variables. SEM is a regression-based technique of multivariate method. It belongs to data analysis of verifying research. The purpose is to explain the causal relationship between variables for verifying theories [23]. Hence, the research model proposed by the researcher should be based on a strong theory in order to use the verifying research method.

This study employs the LISREL of CALIS program in SAS statistical software to run the empirical studies. In the analytical method of SEM, the variables in the model can be manifest variables and latent variables. The latent variables are the research variables in the model. In this study, for example, religious beliefs, moral evaluation, ethical judgments and intention were the latent variables. Manifest variables are testing the potential observational value. In this study, the manifest variables were ‘stupid/clever’, ‘wrong/right’ and ‘unfavorable/favorable’ to testify the moral evaluation. Besides, SEM also considers the testing error of variables. Therefore, SEM can testify the reliability and validity of the variables.
3.3 Structural Equation Model and Measurement Model

<table>
<thead>
<tr>
<th>Structural Equation Model</th>
<th>(X_1 = A_1 \cdot E + \varepsilon_1)</th>
<th>(Z_1 = A_4 \cdot I + \varepsilon_4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(X_2 = A_2 \cdot E + \varepsilon_2)</td>
<td>(Z_2 = A_5 \cdot I + \varepsilon_5)</td>
</tr>
<tr>
<td></td>
<td>(X_3 = A_3 \cdot E + \varepsilon_3)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Measurement Model</th>
<th>(I = B_1 \cdot E + B_2 \cdot I + \delta_1)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(J = B_3 \cdot E + \delta_2)</td>
</tr>
<tr>
<td></td>
<td>(E = B_4 \cdot R + \delta_3)</td>
</tr>
</tbody>
</table>

**Notation Description**

- \(R\): Religious Beliefs
- \(J\): Ethical Judgment
- \(B\): Ethical Behavior
- \(\varepsilon_1, \varepsilon_3, \delta_1, \delta_3\): error items
- \(X_1\)~\(X_3\): the observed items on Ethical Evaluation
- \(E\): Ethical Evaluation (Latent IV)
- \(I\): Ethical Intention (Latent DV)
- \(A_1\)~\(A_5\), \(B_1\)~\(B_4\): parameter
- \(Z_1\)~\(Z_2\): the observed items on Ethical Intention

**Diagram**

4. Empirical Results

4.1 Data Preliminary Analysis

The period allocated for filling out the questionnaires was four weeks, from July 1st to July 28th, 2001.

131 questionnaires were collected. Deducting the 9 incomplete questionnaires, left 122 valid samples. Table 2 indicates that 45% of
respondents were males, with ages ranging between 15 to 49 years. Education level includes high school, university and post-graduate level.
Table 2 Descriptive Statistics of the sample

<table>
<thead>
<tr>
<th>Categories</th>
<th>Items</th>
<th>Number of respondents</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>Male</td>
<td>55</td>
<td>45%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>67</td>
<td>55%</td>
</tr>
<tr>
<td>Age</td>
<td>15-19</td>
<td>7</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>20-29</td>
<td>60</td>
<td>49%</td>
</tr>
<tr>
<td></td>
<td>30-39</td>
<td>45</td>
<td>37%</td>
</tr>
<tr>
<td></td>
<td>Above 40</td>
<td>10</td>
<td>8%</td>
</tr>
<tr>
<td>Highest Education</td>
<td>Junior High school</td>
<td>12</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Senior High School/Technical School</td>
<td>33</td>
<td>27%</td>
</tr>
<tr>
<td></td>
<td>University</td>
<td>49</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Graduate school or above</td>
<td>28</td>
<td>23%</td>
</tr>
<tr>
<td>Occupation</td>
<td>Computer Industries</td>
<td>27</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>Public Sector Services</td>
<td>10</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Academic or Research Institutes</td>
<td>13</td>
<td>11%</td>
</tr>
<tr>
<td></td>
<td>Finance Insurance Industries</td>
<td>6</td>
<td>5%</td>
</tr>
<tr>
<td></td>
<td>Manufacturing Industries</td>
<td>11</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Business-Service Industries</td>
<td>11</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td>Student</td>
<td>26</td>
<td>21%</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>18</td>
<td>15%</td>
</tr>
</tbody>
</table>

4.2 Reliability and Validity Testing

A measure is reliable when it supplies consistent and stable results [7]. In this study, Cronbach’s $\alpha$ was used and the results are shown in Table 3.

Nunnally [25] states that when the $\alpha$ value is higher than 0.7, it indicates that the measuring tool pertains high internal consistency. Its measuring result shows high reliability. When the $\alpha$ value is lower than 0.35, the measuring tool is not suitable and a new measuring tool needs to be developed. In this study, the reliability was over 0.7, which indicates that the measuring tool is internally consistent and reliable. In other words, the measuring tool is suitable for use in this study.

Validity is the extent to which differences found within a measuring tool reflect true differences among respondents being tested. There are three major forms of validity: content validity, criterion-related validity and...
construct validity. The measuring instrument of this study was based on previous research. Therefore, validity is presented in the measuring tool.

Table 3 A comparison of reliability (Cronbach’s $\alpha$) of 2 constructs.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Variables</th>
<th>Synthetic Reliability</th>
<th>Individual Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethical Evaluation</td>
<td>stupid/clever</td>
<td>0.77</td>
<td>0.70</td>
</tr>
<tr>
<td></td>
<td>wrong/right</td>
<td></td>
<td>0.78</td>
</tr>
<tr>
<td></td>
<td>unfavorable/favorable</td>
<td></td>
<td>0.58</td>
</tr>
<tr>
<td>Ethical Intention</td>
<td>Have the intention to conduct software piracy</td>
<td>0.92</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have the intention to try to conduct the behavior of software piracy</td>
<td>0.85</td>
<td>0.85</td>
</tr>
</tbody>
</table>

4.3 Measurement Model Analysis

(1) Structural Equation Model Analysis

The structural equation model (SEM) analysis assesses both the structural model fit and overall model fit. Bagozzi & Yi[3], Joreskog & Sorbom [20], six indicators were selected to evaluate the overall fit of the model, they included: $X^2$ test, normed chi-square ($X^2$/ D.F.), goodness of fit index (GFI), adjusted goodness of fit index(AGFI), normed fit index, non-normed fix index(NNFI).

Table 4 Fit statistics for research model

<table>
<thead>
<tr>
<th>Fit Indices</th>
<th>Guidelines</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X^2$/df (df=13)</td>
<td>&lt;3</td>
<td>30.76/13=2.37</td>
</tr>
<tr>
<td>Goodness of Fit Index(GFI)</td>
<td>&gt;0.9</td>
<td>0.94</td>
</tr>
<tr>
<td>Adjusted for Degree of Freedom(AGFI)</td>
<td>&gt;0.9</td>
<td>0.86</td>
</tr>
<tr>
<td>Bentler &amp; Bonett’s(1980)(NFI)</td>
<td>&gt;0.9</td>
<td>0.94</td>
</tr>
<tr>
<td>Bentler &amp; Bonett’s(1980)(NNFI)</td>
<td>&gt;0.9</td>
<td>0.94</td>
</tr>
</tbody>
</table>

The overall fit of the research model was not all that good. ($X^2=30.76, p=0.0037$). However, the chi-square statistics are subject to the sample size effects, that is, it is sensitive to a large sample size. According to Bagozzi & Yi [3], the sample size should be included in the calculation of overall model
fit, expressed as $X^2$/D.F., to counteract the effect of large sample size. A recommended value of normed chi-square, namely the ratio of the chi-square divided by the degrees of freedom, should be less than 3 [6]. As shown by Table 4, the normed chi-square obtained for this model is 2.37, indicating that the structural equation model does fit the data and therefore, the overall model fit is acceptable.

(2) Hypothesis testing

Figure 2 shows the structural equation diagram of this study with both path coefficients and corresponding t values in parenthesis. All t values except that in the path from moral evaluation (E) to intention (I) is significant (p < 0.05). In conclusion, the model is accepted as appropriate for the sample data suggesting that there is a relationship between religion and the stages of an ethical decision making model.

![Figure 2 Structural equation diagrams](image)

5. Conclusion

A “knowledge-based economy” is the main developmental trend for a future global economy, and the development of the software industry is a critical connection tool for this trend. Thus, it is imperative to create an industrial environment with positive qualities; only if all of us protect intellectual property rights will the software industry become more consolidated and well developed. However, the problems of piracy and illegal usage of software are the most serious threat to an industry that strives for survival and development. In order to break down such barriers,
cooperation between government departments, technology education, and strikes on pirated software are all essential. Besides, religious power is another important, undeniable factor.

According to our research for which the ethical decision-making model was used, it is suggested that there is a positive correlation between the sample data and the model. Moreover, religious beliefs are also another relevant variable in the ethical decision-making stage. In sum, based on the results of this study, we are able to design a concrete plan of action and implementation guidelines for a crackdown on pirated software. One such guideline could be the prevention of software piracy through the influence of religious groups on their members. Religious groups can be encouraged to educate their followers on the proper conduct and attitude towards intellectual property rights.

Appendix

A scenario on software piracy (adapted from Anderson, et al, [1])

Mr. Chan is the database program engineer of a software company. He is currently designing a financial information system. He found some problems on the designing progress which he was unable to solve for months. However, if he does not finish the system design, the company would have to pay a large penalty for the delay. One day, his colleague, Mr. Wu, demonstrated an unauthorized financial information system to Mr. Chan. Part of the program code in that system could solve Mr. Chan’s problem. Mr. Chan thought that in order to finish his project on time, he had no choice but using the program code in his program.

References


