Expansion and Validation of the PAPA Framework

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Abstract

In recent years, ethics has drawn increased interest from information technology and computer science practitioners as well as from academicians. This article investigates the issues outlined in the PAPA framework in today's environment and explores the possibility that new issues have emerged. Findings indicate that the ethicality of property misuse may be viewed differently based on the level of personal risk, thereby offering a refinement of the original PAPA property issue.

Keywords: ethics, ethical dilemmas, unethical behavior, information technology students

1. INTRODUCTION

As society becomes increasingly entrenched in the digital information era, ethics in computing continues to be an important and widely discussed issue in both academia and practice. In 1986, Mason introduced four broad categories of ethical issues for the information age: privacy, accuracy, property, and access, otherwise known as PAPA (1986). More than twenty years later, those four issues are still timely and relevant. Mason's discussion centered on the personal harm that could occur from the unethical use of information and information technology (IT) within the framework of PAPA. In 1986, Mason could never have predicted that the computer would become not only the tool, but also the object, of such serious ethical transgressions as those that occur in today's networked world. However, his PAPA framework is still quite germane in studying ethical issues in IT. This research attempts to test the issues outlined in the PAPA framework in today's environment and to explore the possibility that new issues have emerged. This test and exploration is accomplished through the enhancement and validation of a survey instrument first introduced by Harris (2000).

2. BACKGROUND

Mason's (1986) seminal essay did not specifically define the PAPA issues as theoretical constructs, but rather launched each as an area of discussion and debate. Mason's concern for *privacy* was that an individual should be able to decide what personal information to hold private, what information to share, and be confident that shared information would be kept safe. The issue of *accuracy* focused on discussions of who was responsible for the accuracy and authenticity of information and what retribution was due to those injured by erroneous data. Mason's discussion of *property* addressed intellectual property rights, including those not necessarily protected by law. Mason also made reference to physical property such as the

"conduits through which information passes" (p. 10). The final issue of the PAPA framework, *access*, dealt with the right or authority to obtain information.

Cadres of research in ethics and IT have been published since Mason's visionary essay in 1986. Several studies have considered one or a few of the PAPA issues, but only one known study attempted to measure or validate all four PAPA constructs. Using ethical dilemma scenarios, Conger, Loch, and Helft (1995) developed a 16 scenario/51 item instrument and surveyed 79 graduate business students. The analysis produced 12 factors which the authors grouped into five clusters. Two of the clusters aligned well with Mason's *access* and *privacy* issues. A third cluster aligned with Mason's property issue, but was better defined by the concept of *ownership*. A fourth cluster represented "*responsibility for accuracy*" (p. 25), a different perspective from Mason's concern with the impact of inaccuracy. A fifth cluster, *motivation*, represented an expansion the PAPA framework. While Mason offered a general discussion of victimization, Conger et al.'s motivation cluster reflected a recognized responsibility for actions that affect others.

More recently, Harris (2000) developed an instrument to measure student attitudes toward IT-related ethical dilemma scenarios. He found some evidence that sensitivity toward IT ethical issues increased as academic training increased. Harris also found support indicating that females may be more sensitive to IT ethical issues involving software use. Although it was not Harris' intention to measure the validity of PAPA constructs, his instrument questions were "roughly developed around Mason's PAPA" (p. 802).

Twenty years after Mason's ethical issues essay, Peslak (2006) surveyed more than 200 individuals and verified that the four original PAPA issues were still viewed as timely and important ethical concerns.

As part of a larger research endeavor, the primary objective of the current study was to determine if the ethical issues first delineated by the PAPA framework were still relevant and if other issues have replaced them. An additional objective was to explore any current issues that should be added to the PAPA framework. These objectives are important to IS educators so that ethics education can continue to evolve as the issues our students and future IT professionals are faced with also evolve.

3. METHODOLOGY

As noted by the prior studies, the use of ethical dilemmas or situations is an effective method of evaluating how students make ethical decisions (Cougar, 1989; Loviscky, Trevino, & Jacobs, 2007). After an extensive review of the literature, only the two aforementioned studies had used ethical dilemmas related to the PAPA issues. The survey instrument designed by Harris (2000) was selected as the basis to evaluate the ethical decision making of information technology students. Harris' survey is referred to as the Ethics in Information Technology (IT) Survey and was used with the author's permission. This instrument was chosen because it better reflects current ethical dilemmas facing students as well as professionals in the field.

Examples of the ethical dilemmas include such scenarios as using company email to send spam, copying software from work for personal use, and giving a non-student friend login access to university computing resources. The instrument has been enhanced from Harris' original and the detailed wording of the scenarios was published in an earlier study (Woodward, Davis, & Hodis, 2007).

The final survey contained 22 scenarios; some with multiple items for a total of 29 items. In the scenarios, an individual is presented with a situation and required to make a choice for a particular action. The students were asked to evaluate the individuals' responses to the situations presented. In some scenarios, respondents evaluated two party's actions, for example, the manager and the employee. Students were to mark a number on a Likert scale indicating whether the individual's action was ethical (0), acceptable (1), questionable (2), unethical (3), or computer crime (4). The choices on the scale are described as:

- Ethical - There is no question that the action is correct in every sense of the word. Ethically, morally, and legally, this is proper behavior.
- Acceptable - The action is acceptable to you, although you may have some doubts due to morals or other beliefs.
- Questionable - There is some question as to the moral or ethical aspects of the action. The action truly belongs in the "gray area" of human behavior.
- Unethical - The action is contrary to moral and ethical standards, although not a crime. This is truly unacceptable behavior.

• Computer Crime - The action is unethical and illegal, and the person responsible should be prosecuted for a criminal act (Harris, 2000).

IT students are an appropriate population since they are routinely faced with situations where they may be forced to make ethical decisions. Moreover, students have been shown to recognize PAPA issues as important when compared to professionals and others (Peslak, 2006). Additionally, younger populations, both students and younger professionals, have been shown to be more accepting of certain unethical behaviors such as the illegal copying and use of software (Kini, Ramakrishna, & Vijayaraman, 2004; Kruger, 2003; Peace, Galletta, & Thong, 2003). For these reasons, we selected undergraduate IT students for this study.

The survey was administered to undergraduate IT students in universities in four countries. Because ethics in IT is a worldwide issue, the inclusion of multiple cultures should contribute to the validity of any outcomes of the study. The comparative responses among the countries are being analyzed as part of the larger study and hence are not specifically addressed in the current study.

The survey was completed by 373 IT students: 198 from an American Midwest region university, 44 from a main British university, 51 from a main German university and 80 from a main Italian university. Of the total sample, 20% were female students (N=71) and 80% were male students (N=284). The average age of the respondents was 23.5. The total final valid sample was 355. The students participated voluntarily and were ensured of the confidentiality of their responses and all surveys were completed anonymously. The same instructor administered the surveys in all locations.

Data Analysis

To determine if an underlying structure of PAPA related factors exists in the survey items, exploratory principal component factor analysis was conducted. Because there was an apriori assumption that any resulting factors could likely be related, all dealing with ethical issues in IT, Promax, an oblique rotation method, was selected.
The subject to item ratio in this study was approximately 12:1, greater than the generally accepted 10:1 ratio for exploratory factor analysis (Costello & Osborne, 2005). The data were screened for multicollinearity concerns and review of the correlation matrix combined with an R-matrix determinant equal to .001 assured that multicollinearity was not a concern in the data. The KMO statistic for the data was .823 and Bartlett's test was highly significant, indicating factor analysis was appropriate for the data (Field, 2000).

Proceeding with a Promax rotation, a cutoff value of .30 was utilized as a minimum acceptable item loading (Hair Jr., Tatham, Anderson, Black, & Babin, 2006). The initial solution produced 9 factors based on Kaiser's criterion of retaining factors with eigenvalues greater than one, explaining 60.22% of the variance in the data. However, nine factors led to interpretation difficulties because several factors displayed item cross-loadings and several contained fewer than three items. These conditions do not contribute to a "clean" factor structure (Costello & Osborne, 2005). Furthermore, the Kaiser criterion is considered one of the least accurate methods for selecting the appropriate number of factors (Velicer & Jackson, 1990). Therefore, we proceeded to interpretation of the scree plot. The scree test indicated an obvious break point in the data after four factors. To ensure proper selection, we analyzed the data creating three through nine factors, and the four factor solution produced the cleanest factor structure, even though the explained variance was reduced to 41%. Therefore, data analysis proceeded with a four factor solution. The resulting factor structure is displayed in Appendix 1.

4. RESULTS

Factor 1 contained 11 items with scores ranging from .816 to .333. The reliability of the factor was measured by Cronbach's alpha at .80, an acceptable level (Nunnally, 1978). Factor 2 contained 8 items with loadings ranging from .782 to .351. The Cronbach's alpha score was .793, also an acceptable level of reliability (Nunnally, 1978). Factor 3 consisted of 3 items with loadings in the range of .768 to .339. The reliability of this factor was weak at .430. Factor 4 contained five items ranging in loadings from .808 to .313. The Cronbach's alpha measure of reliability for this factor was also weak at .501. Although the fourth factor contained a variable, email checking, that loaded fairly evenly across three factors, the reliability analysis indicated that eliminating it from Factor 4 would lower the scale score. Hence, the variable was retained in the analysis. The items bank employee and inaccurate pro-

gramming did not load onto any of the four factors.

Factor Interpretation

Low Risk Property Misuse: The 11 items in the first factor are related to the misuse of property, such as software and other computing resources. For example, making copies of software or using a company computer for personal business were issues in this factor. This category aligns with Mason's (1986) *property* issue and Conger et al.'s (1995) Ownership category of ethical issues. We labeled this factor *Property Misuse.*

Interestingly, in the responses, the majority of students found these issues to range from questionable to unethical, but relatively few rated the actions as criminal even though obvious copyright infringement occurred in some of the scenarios. This factor may also represent a motivational aspect of property misuse, similar to the personal motivation factor that Conger et al. (1995) discovered. A common theme in the scenarios in this factor is the personal gain from the action and somewhat private nature of the behavior. It is possible that this factor represents the misuse of property where the risk of retribution is considered quite low. For these reasons, we labeled this factor *Low Risk Property Misuse*.

High Risk Property Misuse: The second factor consisted of eight items, most also reflecting issues of unethical or criminal behavior toward property. Some issues in this factor represented criminal trespass of property, such as the use of trademarks and patents. Other issues represented unethical or criminal actions, such as manipulating data or not reporting a software error.

A distinctive difference between the *Low Risk Property Misuse* factor and this factor was found in the student responses. While in the *Low Risk Property Misuse* factor, most respondents felt the issues were questionable or unethical, in this factor, most respondents felt the issues were at minimum unethical and at most criminal.

The items differed from the Low Risk Property Misuse factor in terms of possible motivators. Most of the items in this factor are related to actions on behalf of an organization, albeit some personally owned organizations, rather than action for individual gain. The scenarios that fell into this factor also appear to carry more risk than those in the previous factor. For example, the illegal use of a trademark on a website is quite a transparent violation that could easily be identified. Similarly, patent infringement is a risky action that might be discovered and litigated. Because the actions in this factor appear similar in their level of perceived risk as opposed to those in the previous factor, we labeled this factor *High Risk Property Misuse.*

Personal Responsibility: The third factor was rather unstable with a reliability score of .430 and should thus be interpreted cautiously. The issues in this factor seemed to reflect respondents' difficulty in determining true harm. For example, sending political spam from a company computer when there was no specific policy against it or spreading a virus for the sake of experimentation were not clear cut ethical issues. The third item placed the actionable party once removed from the unethical behavior; she would create a website that would be used by the customer for unethical activity. These issues were intended to represent the responsibility of one's actions. Our *Personal Responsibility* factor most closely aligns with Conger et al.'s (1995) Personal Accountability category. Most student respondents found these three issues to be at best questionable and at worst unethical.

Privacy: The fourth factor consisted of five items all representing various facets of privacy. This factor displayed a weak reliability score at .501 and should be interpreted with caution. Examples of the scenarios include firing an employee for inappropriate web browsing and management monitoring of employee email. Labeled *Privacy*, this factor aligned with Mason's privacy issue and with Conger et al.'s (1995) category of Personal Privacy. The student responses were not as clearly categorized as in the other factors. The respondents felt that the actions of the managers fairly evenly ranged from ethical to unethical even when workplace policies were lenient or absent. They also reported that the employee's actions were unethical even considering a fairly lenient usage policy.

5. DISCUSSION

Keeping abreast of ethical dilemmas faced by our future IT professionals is of critical concern to IS educators. As technology rapidly advances, current and future professionals are faced with an ever-changing array of ethical situations. It is the duty of IS academia to con-

tinually evolve the IS ethics curriculum to keep pace with such changes. Because variations of the PAPA issues have stood the test of time, we attempted to validate and potentially update the PAPA framework as a guiding tool for both IS academia and IS professionals.

Mason's (1986) ethical issues of concern for the information age were *property, accuracy, privacy*, and *access*. Conger and her colleagues (1995) offered a more complex view of computer related ethical issues and categorized them into five subject areas: *ownership, access, motivation, responsibility*, and *privacy*. In our analysis, we derived four distinct factors, although two were related to property misuse. Our factors were *low risk property misuse, high risk property misuse, personal responsibility, and privacy.*

While both Mason (1986) and Conger et al. (1995) identified *property/ownership* as an ethical issue of concern, our results break down the issue into perceived risk levels associated with the maltreatment of property. Even though misuse is technically misuse, our results appear to delineate levels of "acceptable" property misuse at least within a cross-cultural student population. By uncovering this more precise view of property misuse, we believe we have expanded upon the earlier frameworks.

Our *personal responsibility* factor seemed to reflect the respondents' indifference toward their accountable actions when there was little policy or guidance in place, or when they were once removed from the final result of their actions. Mason's (1986) PAPA framework did not address this issue specifically. Though not a perfect match, our factor most closely aligns with Conger et al.'s (1995) *personal accountability factor* within their *responsibility* category. Because our factor displayed a cautionary reliability measure, as did Conger et al.'s, this particular ethical issue is a prime area for further exploration.

Our *privacy* factor, while weak in its reliability score, validates that this issue remains of key concern just as Mason predicted many years ago. We know that as Internet use grows, privacy continues to be a hotly discussed and debated topic. This ethical issue would be a good candidate for further refinement as well, possibly discerning between various levels of risk associated with personal privacy.

The low reliability scores for the *personal responsibility* and *privacy factors* are cause for further review. Perhaps the scenarios comprising these two factors were less clear cut to some of the respondents. Moreover, issues such as use of pornographic material may be viewed differently by different cultures. Further data analysis is needed to compare factor structures among the different countries.

Another possible explanation for the low reliability scores for the third and fourth factors is that perhaps there are really only a few dominant issues recognized by most students such as our varying levels of property misuse. Regardless of the reasons, it is clear that further refinement of the instrument is required.

6. LIMITATIONS AND FUTURE RESEARCH

As with any study, limitations must be acknowledged. In the current study, the use of students as survey respondents may have influenced the results. It is possible that even though participation was voluntary and anonymous, some students did not address the scenarios honestly or seriously.

Additionally, perhaps the translation of the instrument into different languages caused different groups to interpret scenarios differently. Further breakdowns and comparisons among the countries will be analyzed.

Another potential limitation is the research design. We chose to use ethical dilemma scenarios in order to build upon the work of other IS scholars. Perhaps a different approach would produce more enlightening results. For example, qualitative studies which include interviews with IT professionals might be warranted.

The authors plan to continue work in identifying and classifying current ethical issues. The instrument used in this study can serve as a starting point for enhancement, modification and retesting, and other approaches will also be investigated. Other researchers are encouraged to also enhance upon this work.

7. CONCLUSION

The PAPA framework established an important framework for considering ethical issues in our field. This study identified a valid refinement of the issue of property misuse and thereby informs those teaching in the area of IT ethics.

For educators, it remains clear that we have an obligation to teach our students how to be responsible IT citizens, both in the workplace and in their personal lives. With each refinement of the ethical issue agenda, we can utilize the

results to enhance and further expand our ethics related pedagogies.

Our results also create implications for IT practitioners. It is important for IT professionals, especially managers, to understand that some employees might view computer related ethical issues based on their personal level of risk. For example, if no policy on personal email usage is in place, an employee might not see the harm in using company resources to send spam email for a good cause. It is important that organizations clearly define computing resource usage policies to prevent such actions.

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Appendix 1. Four Factor PCA Results

Scenario Item	Factor 1	Factor 2	Factor 3	Factor 4
copy of spreadsheet	**.816**			
word processing use	**.785**			
copy of software	**.701**			
shareware downloading	**.650**			
music download	**.595**			
company PC use	**.521**			
password leaking	**.450**			
unauthorized computer use	**.443**		.366	
making and selling	**.421**			
off-shore gambling	**.398**			
email employee	**.333**			
trademark stealing		**.782**		
patent leaking		**.751**		
abuse authority		**.670**		
patent violation		**.662**		
shareware virus		**.530**		
data manipulation		**.517**	.319	
error reporting		**.376**		
access to payroll record	.302	**.351**		
email sending			**.768**	
website creation			**.585**	
virus spread	.311		**.339**	
firing porn site user				**.808**
email manager			.310	**.531**
pornographic site user		.359		**-.515**
email checking		.436	-.439	**.463**
database leaking		.307		**.313**