



A Comparative Investigation of Ethical Decision Making: Information Systems Professionals versus Students

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Abstract

As information technology evolves, it continues to raise new ethical challenges. In recognition of this, the business and academic communities have focused increased attention on ethics. Professional codes of ethics have been enacted by the ACM, AITP, and other computing organizations to provide guidance to information systems (IS) professionals in resolving ethical dilemmas. In addition, the IS'95 model curriculum and the American Assembly of Collegiate Schools of Business (AACSB) guidelines for business education both recognize the importance of ethics in business educational programs.

This paper explores an important question that has been neglected by previous research: do IS professionals differ significantly from students in terms of their perceptions about ethical issues? Two studies were conducted and they revealed a number of ethical decision-making differences between professionals and students. This result, along with an additional finding that participants showed little consensus about most ethical scenarios, suggests that ethical decision making is often difficult and that both students and professionals can benefit from ethical training and education. The findings also have important implications for IS research.

ACM Categories: K.7, K.3.2, K.6

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Introduction

According to IS'95, the joint model curriculum for undergraduate programs in information systems (IS) developed by the Association for Computing Machinery (ACM), the Association for Information Systems (AIS), the Data Processing Management Association (DPMA), and the International Conference on Information Systems (ICIS), IS graduates should possess "professionalism." This attribute entails a competence to "engage in appropriate behavior consistent with professional standards," with the ability to "adhere to ethical standards," and use knowledge of "codes of conduct, ethical theory, and standards for practice" (Cougar et al., 1995a).

The IS'95 model curriculum also states that "IS professionals must set a high ethical standard" (Cougar et al., 1995b), and it notes that "codes of ethics, privacy, honesty, and the social and ethical responsibilities of the computing professional" are important elements of the body of knowledge for IS professionals (Cougar et al., 1995b).

The recognition of ethics in this model curriculum is consistent with professional codes of conduct issued by the ACM, the Association of Information Technology Professionals (formerly the DPMA), the Institute for Certification of Computer Professionals (ICCP), the Association of Systems Management (ASM), and other computing organizations. In addition, the American Assembly of Collegiate Schools of Business (AACSB) identifies ethical issues as an important component of undergraduate business curricula. Various books have also been published that highlight the importance of ethical issues in information systems (Baase, 1997; Kling, 1995; Dejoie et al., 1991; Kallman and Grillo, 1993; Parker et al., 1990; Mason et al., 1995; Oz 1994). In addition, a survey of IS professionals by Vitell and Davis (1990) found that they have many potential opportunities to engage in unethical behavior in their companies.

These all serve as indicators that IS professionals *do* confront ethical issues in performing their job duties. The use of information technology raises many important ethical concerns including the potential misuse of computer databases, inadequate access controls, electronic monitoring of employees, copying protected software, and the distribution of pornography on the Internet (Conger and Loch, 1995). In many cases, ethical decision making is difficult since it requires balancing competing interests. To enhance the ability of IS professionals to confront and resolve ethical situations, the IS'95 model curriculum and writers such as Huff and Martin (1995) and Cougar (1989) have pointed out the importance of addressing ethics in the IS curriculum.

Most previous studies of information systems ethics have utilized student samples. In contrast, this investigation involves two studies that compared both IS students and professionals in terms of their perceptions about ethical issues. The first study utilized an instrument of IS ethical scenarios, while the second employed a well-known test of moral reasoning, the Defining Issues Test. The underlying research question is: do IS profession-

als and students differ significantly in terms of ethical decision making? The findings about this issue potentially have important implications for IS education, training, and research.

Prior Research

Ethics is receiving increased attention across various business disciplines due, at least in part, to the scandals and negative publicity that have plagued business and government in recent decades. Examples of prominent incidents and issues that have provoked controversy over organizational ethical conduct include top executives of companies being caught on tape displaying discriminatory attitudes toward minorities, savings and loan failures, insider trading fraud, toxic waste disposal, product safety issues, and governmental officials accepting gifts that raise conflict of interest questions. Organizations today face continued scrutiny from the media and public interests groups that are eager to expose actions that may be questionable from an ethical point of view. The high cost of unethical behavior to companies can include heavy fines, embarrassment, the loss of public confidence and reputation, low employee morale, a disruption in the normal business routine, and difficulty in recruiting (Nash, 1993). To prevent these difficulties, professionals in all business functions including information systems need to have a heightened awareness of the ethical ramifications of the decisions they face.

Mason (1986) was one of the first authorities to highlight the importance of ethics to information systems. He identified four key ethical issues in information systems: privacy, accuracy, property, and access. Since then, various writers have contributed important work to illuminate these and other ethical issues. For example, in the privacy arena, researchers have investigated issues such as the appropriateness of reusing consumer data for target marketing purposes (Culnan, 1993; Culnan and Regan, 1995), electronic mail monitoring and privacy (Sipior and Ward 1995; Weisband and Reinig, 1995; Cappel, 1995), and the impact of cultural values, nationality, and other factors on privacy perceptions (Milberg et al., 1995). As information technology continues to evolve and raise ethical challenges, this body of research will likely grow in response.

In the business ethics literature, various models have been developed to identify the important fac-

tors that affect ethical decision making (Bommer et al., 1991; Jones, 1991; Hunt and Vitell, 1986; Trevino and Youngblood, 1990; Ferrell et al., 1989; Stead et al., 1990). These and other theoretical models have inspired various comparative studies of ethical decision making. For example, Paradice and Dejoie (1991) and Kievet (1991) used the Defining Issues Test to compare the ethical reasoning of IS majors versus students from other business majors. Hendrickson and Latta (1995) considered ethical decision making differences between business majors and arts and sciences majors. Stevens et al. (1993) investigated the ethical decision making of business majors versus business school faculty. Glenn and Van Loo (1993) and Arlow and Ulrich (1985) compared the ethical decision making of business majors versus business professionals.

According to the Bommer et al., (1991) model, which serves as the theoretical foundation for this study, the general factors that affect ethical decision making include individual characteristics (e.g., demographic and personality variables), social and religious values, the law, professional codes of conduct, company goals, and culture. Based on this model, IS professionals would be expected to differ from students in terms of ethical decision making based on differences in their individual characteristics such as professional experience, education, and age. However, no prior studies were identified in a literature review that compared information systems professionals and students with respect to ethical decision making. Only one study bordered on addressing this issue. Athey (1993) compared the responses of IS students to the previously published results of a panel of "experts" who responded to the same cases in an ethics symposium. It is important to note, however, that the make-up of this panel was heterogeneous, in that besides IS professionals it included lawyers, philosophers, and professionals from other fields. Thus, the first testable hypothesis for this investigation, stated in null form, is:

H_{1.0}: Information systems professionals and students do not differ in terms of IS ethical decision making.

Beyond the issue of "what" actions are perceived as ethical, a second important concern is to consider "how" ethical decisions are supported or justified. In the ethics literature, this notion is referred to as "ethical reasoning" or "moral reasoning."

Various theoretical models (e.g., Bommer et al., 1991; Jones, 1991; Hunt and Vitell, 1986; Trevino and Youngblood, 1990; Ferrell et al., 1989) have recognized its importance to ethical decision making. Prior research indicates that age and education lead to significant differences in ethical reasoning (Trevino, 1992). Since IS professionals and students would be expected to differ significantly on these characteristics, the second hypothesis considered in this investigation, stated in null form, is:

H_{2.0}: Information systems professionals and students do not differ in terms of ethical reasoning.

Study One: IS Ethical Scenarios

In the first study, IS professionals and students responded to six information systems-related ethical decision-making scenarios that were selected from Parker et al., (1990) or adapted from Paradice (1990). These scenarios, summarized in Table 1, were chosen from dozens of cases based on three criteria. First, the subject matter of the cases was varied to reflect the fact that IS professionals face a variety of ethical challenges.

Second, only cases were selected for which there was little doubt that they involved ethical issues. This was determined from examining the results of previous administration of the cases (Parker et al., 1990; Paradice, 1990) as well as the authors' own pre-test results, which showed that respondents had a high level of agreement that the cases involved ethical issues.

Third, scenarios were chosen that tended to produce a relatively high level of disagreement based on pre-tests results and previous administrations. This was deemed to be important considering the goal of the study to explore potential ethical decision making differences between groups. Alternatively, if cases were selected that were likely to produce a high level of agreement among all respondents, there would be little point in administering them to multiple samples since participants would likely respond similarly regardless of differences in their characteristics. It is important to stress, however, that the cases were chosen based upon their ability to produce disagreement among *all* respondents. No attempt was made to select tasks that would be expected to produce differences *between* IS students and professionals based upon their background differences.

Scenario A	a SOFTWARE PROFESSIONAL continues to work on a project that depends upon questionable inputs
Scenario B	a STUDENT copies a spreadsheet program from a university lab and puts the software on her home computer to do her assignments at home; at the end of the semester, the student deletes the copy on her home PC
Scenario C	a SECURITY CONSULTANT runs for a professional computer society office without disclosing a computer-related felony conviction he committed five years earlier
Scenario D	a PROGRAMMER compiles a mailing list from publicly available sources which contains sometimes invalid customer profiles; this results in some consumers receiving unwanted junk mail and phone solicitations
Scenario E	a COMPUTER SCIENTIST diverts funds from one research project to pay for another related project
Scenario F	a COMPUTER EXECUTIVE influences his company to provide computers to his children's school but not to another, poor school in the same school district

All cases were selected from Parker et al. (1990) except scenario B, which was adapted from Paradise (1990).

Table 1. A Summary of IS Ethical Scenarios

For each scenario, subjects indicated whether they considered a certain action to be ethical or unethical in terms of a seven-point response scale, ranging from "highly ethical" to "highly unethical" with a mid-point of "don't know/no opinion." The response scale used is presented in Appendix A.

Employing a response continuum rather than the dichotomous response alternatives of "ethical" versus "unethical" recognizes the fact that many ethical decisions are not clear-cut; instead, they involve elements of both ethically acceptable and unacceptable behavior (Reese and Fremouw, 1984). For this reason, many prior studies of ethical decision making have utilized multiple-point response scales for ethical scenarios (e.g., Khazanchi, 1994; Chaney and Simon, 1994; Glenn, 1992; Arlow and Ulrich, 1985; Wynd and Mager, 1989). While the response scale of this study does not contain numbers (as shown in Appendix A), subjects' answers were converted to a numerical scheme for data analysis, ranging from "1" for "highly ethical" at left end of the response scale to "7" for "highly unethical" at the opposite end. Subjects also completed a short, open-ended "rationale" section to justify their decision for each scenario. This helped to ensure that participants carefully thought about their answers before responding.

The subjects in both samples were given approximately twenty minutes to complete the survey. A total of 76 information systems professionals participated in survey administration sessions held at company sites. The participating organizations included the computing staffs of a major international retailing company, an international IS consulting/outsourcing firm, a major airline, and a large public university. To protect the confidentiality of responses, the subjects completed the survey anonymously. The identical survey was administered to a sample of 71 senior-level information systems majors at a large university in the Southwest. Consistent survey administration procedures were followed for the student sample including the completion of the survey on an anonymous basis.

The demographic characteristics of both samples are presented in Table 2. As indicated in the table, the samples did not differ in terms of gender ($X^2 = 0.358$, $p = .55$), race ($X^2 = 6.803$, $p = .15$), and religion ($X^2 = 2.659$, $p = .62$). In contrast, as expected, students and professionals differed significantly with regard to education. IS professionals completed an average of 16.77 years of school versus 15.75 for students ($t = 4.50$, $p < .000$). For the other two variables, years of IS experience and age, different response options were used for the samples for logical and data analysis purposes. For example, while

	Professionals		Students		X ² or t	p
GENDER					X ² = 0.358	.55
Male	65.7 %		34.3 %			
Female	70.4 %		29.6 %			
RACE					X ² = 6.803	.15
White	83.6 %		68.6 %			
Asian/Pacific Islander	10.4 %		12.9 %			
Hispanic	4.8 %		7.1 %			
Black	2.0 %		10.0 %			
American Indian	0.0 %		1.4 %			
RELIGION					X ² = 2.659	.62
Protestant	52.5 %		44.9 %			
No affiliation	24.6 %		24.6 %			
Catholic	19.7 %		21.7 %			
Jewish	0.0 %		2.9 %			
Other	3.8 %		5.8 %			
EDUCATION	mean	16.77	mean	15.75	t = 4.50	< .0001
	SD	1.84	SD	0.53		
YEARS OF IS EXPERIENCE					n/a	n/a
	< 3	14.5 %	none	47.9 %		
	3-5	11.3 %	0.1-0.99	19.7 %		
	6-10	21.0 %	1.0-2.0	15.5 %		
	11-15	25.8 %	2.1-3.0	7.0 %		
	over 15	27.4 %	3.1-5.0	5.6 %		
	median (est.):		over 5	4.3 %		
	11.62 yrs		median (est.):	0.11 yrs.		
AGE	29 or less	14.9 %	< 23	21.1%	n/a	n/a
	30-39	50.7 %	23-28	49.3 %		
	40-49	25.4 %	29-35	19.7 %		
	50-59	9.0 %	36-45	9.9 %		
	60-over	0.0 %	46-over	0.0 %		
	median (est.):		median (est.):			
	36.92 yrs.		25.93 yrs.			

Table 2. Demographic Characteristics (Study One)

the response category of "no experience" was relevant to students, it was not appropriate to professionals, who, by definition, had at least some IS experience. For both samples, the response categories were also partitioned to obtain a distribution of responses across categories, so that the potential effects of each of these demographic variables could be examined on the responses given to each of the cases using correlation analysis. While the use of different response options across samples for years of IS experience and age prevented significance testing, the estimated medians of both samples on

these measures are markedly different. The median years of IS experience for professionals was 11.62 compared to 0.11 for students, and the median age of IS professionals (36.92) was also more than 10 years higher than for students (25.93). These medians were estimated based on identifying the 50th percentile of the responses and assuming an equal distribution of responses within the response category where the median occurred. Medians were employed as a measure of central tendency instead of means due to the skewed nature of the responses for these variables, as is evident in Table 2.

IS Ethical Scenario Results

The first hypothesis involves whether IS professionals and students differ with respect to IS ethical decision making. To evaluate this issue, subjects' mean responses to information systems-related scenarios are considered in Table 3. As noted earlier, the higher the mean, the more strongly it represents a response in an "unethical" direction in terms of the seven-point response scale. As shown in the table, the responses of IS professionals differed from students for four of seven measures: scenarios A, B, and D, and the overall measure. The strongest differences occurred for scenarios A and D, which were significant at the $p < .01$ level. The other two differences, those for Scenario B and the overall measure, were significant at the $p < .10$ level. These differences are explored below based on a content analysis of the open-ended responses to each case.

Scenario A. As indicated in Table 1, this case involved whether it was ethical for a software professional to continue to work on a software development project that depended upon questionable inputs. The employee conformed to his supervisor's instructions to do this despite having good reason to believe that the inputs to the system could not be trusted. The results showed that, on average, IS professionals considered this action to be "ethical" while students viewed it as "unethical." The difference in the average responses of professionals (3.34) versus students (4.21) was significant at the $p < .01$ level ($t = -2.68$, $p = .008$). Based on a review of the open-ended responses, this difference appears to be due to a tendency for

the older, more experienced sample of professionals to show more deference to authority, as opposed to students who are likely to be more idealistic about work situations and more apt to question persons in positions of authority. The perceptions of professionals about this case are consistent with the findings of Jackall (1988) that supervisory pressures exert a strong influence on professionals' perceptions of ethical behavior in the workplace.

Scenario B. This case addressed the action of a student to copy a software program from her university computing lab, so that she could complete her assignments at home, even though the student destroyed her home copy of the software at the end of the semester. The results indicated that while both samples were disapproving of this practice, professionals showed significantly more disapproval than students, as indicated by their respective means of 5.80 and 5.34 ($t = 1.79$, $p = .076$). An analysis of the open-ended responses revealed that this case "hit closer to home" for students than professionals. Students were more tolerant of this practice based on their greater empathy for the pressures that college students face – including having limited financial resources to purchase software and time pressures to complete assignments, whereas professionals gave more emphasis to the illegal nature of the action.

Scenario D. This scenario involved the action of a programmer to compile and sell mailing lists from publicly available information, even though some of the customer profiles it contained were inaccurate. The results indicated that professionals showed

	Professionals		Students		Statistics	
	Mean	SD	Mean	SD	t	p
Scenario A	3.34	1.99	4.21	1.93	-2.68	.008 ***
Scenario B	5.80	1.42	5.34	1.69	1.79	.076 *
Scenario C	3.76	1.99	4.10	2.09	-1.01	.316
Scenario D	3.18	1.82	4.25	2.11	-3.29	.001 ***
Scenario E	4.62	1.73	4.27	1.97	1.15	.251
Scenario F	3.72	2.06	3.70	2.11	0.06	.949
Overall	4.07	2.04	4.31	2.03	-1.77	.078 *

*** Statistically significant at the $p < .01$ level; ** Statistically significant at the $p < .05$ level

* Statistically significant at the $p < .10$ level

Table 3. Results of Study One: IS Ethical Scenarios

that, on average, IS professionals considered this action to be “ethical” while students viewed it as “unethical.” The difference in the means of professionals (3.18) versus students (4.25) was significant at the $p < .01$ level ($t = -3.29$, $p = .001$). A review of the open-ended responses indicated that professionals viewed the case more from a business point of view (showing greater understanding of the need for businesses to use tools such as mailing lists to generate sales), while students focused more on the consumer perspective (i.e., being bothered by annoying phone calls and junk mail as a result of the programmer’s actions).

Overall Measure. This measure was calculated by averaging subjects’ responses to all six cases. This analysis showed that students demonstrated a greater tendency to decide all of the cases in an “unethical” direction than professionals, as indicated by overall means of 4.31 and 4.07, respectively ($t = -1.77$, $p = .078$). This difference, however, should not be interpreted to say that students are “more ethical” than professionals. Students appear to have responded more in an “unethical” direction based on having a more limited frame of reference in interpreting workplace events, being more idealistic or naïve about work situations, and having a greater proclivity to question authority. In contrast, professionals are more sensitized to workplace realities, such as pressures from supervisors, co-workers, and generally accepted company and industry practices. The “bottom line” is that experiential differences between the samples led them to view ethical situations through a different “cognitive lens” and, hence, decide a number of them differently.

Lastly, it should be noted that respondents in both samples showed little consensus about most of the ethical scenarios. The mean response of both samples for six of the seven measures in Table 3 was between three and five in terms of the seven-point scale, which approached the mid-point of “don’t know.” Only scenario B, which was the only case involving illegality, generated some degree of consensus, with a mean response greater than five in both samples. The lack of consensus about most scenarios was not unexpected since the cases were chosen, in part, based on their ability to provoke controversy. However, the observed diversity of opinion about them underscores the fact that ethical decision making is often difficult and complex.

Analysis of demographic factors. Separate correlations or chi-square analyses were performed

between each of the six demographic variables (gender, race, religion, education, years of IS experience, and age) and the responses given to each case to determine whether any of these factors had a significant impact on the responses obtained. The results indicated that when controlling for participant type, there were only two occurrences of statistically-significant relationships. Respondents with some type of religious affiliation perceived the action in scenario B (the student copying the software in the university lab) to be significantly more “unethical” than participants who had no religious affiliation ($F = 2.88$, $p = .026$). A second observed significant difference was that Caucasian participants on average viewed the action in scenario C (the security consultant running for a professional office without disclosing a felony conviction) to be more “ethical” than participants from other racial groups ($F = 4.54$, $p = .002$). Future research may be beneficial in exploring the impact of demographic characteristics such as these on selected cases of ethical decision making.

Study Two: The Defining Issues Test

Many ethical decision-making models (e.g., Bommer et al., 1991; Jones, 1991; Hunt and Vitell, 1986; Trevino and Youngblood, 1990; Ferrell et al., 1989) recognize the importance of ethical reasoning (also called “moral reasoning”) on ethical decision making. Thus, ethical reasoning was considered as a second relevant measure of ethical decision making upon which to compare IS students versus professionals. It was assessed through the most popularly-used measure of ethical reasoning, the Defining Issues Test (DIT) (Rest, 1990; Trevino, 1992). The DIT (Rest, 1979) assesses how people justify, or support, their ethical decisions in terms of Kohlberg’s (1969) levels of moral reasoning, which are presented in Table 4.

According to Kohlberg, there are three levels of moral development, pre-conventional, conventional, and post-conventional, each of which consists of two stages. Pre-conventional morality involves deciding ethical issues based on avoiding punishment and seeking rewards, conventional morality entails living up to the expectations of relevant others and upholding the law, and post-conventional morality focuses on making ethical decisions in accordance with ethical principles.

The most commonly-used measure of the DIT is the “P-score,” which is the extent to which individ-

	Levels and Stages	Description
LEVEL 1	PRE-CONVENTIONAL MORALITY	ethical decision making based on avoiding punishment or seeking rewards
Stage 1	Punishment orientation	obeys rules to avoid punishment
Stage 2	Reward orientation	conforms to obtain rewards or to have favors returned
LEVEL 2	CONVENTIONAL MORALITY	ethical decision making based on the influence of other people and other forces (e.g., laws)
Stage 1	Good boy/girl orientation	conforms to avoid the disapproval of others
Stage 2	Authority orientation	upholds laws and social rules to avoid censure of authorities and guilt about not doing one's duty
LEVEL 3	POST-CONVENTIONAL MORALITY	ethical decision making based on following ethical principles
Stage 1	Social contract orientation	actions guided by principles commonly agreed to as essential to society
Stage 2	Ethical principle orientation	actions guided by self-chosen ethical principles that usually value justice, dignity, and equality

Table 4. Kohlberg's Levels of Moral Reasoning

uals use "principled moral reasoning" (the highest level of Kohlberg's model, post-conventional reasoning) in making ethical decisions. Since 1972, the DIT has been administered to thousands of subjects in hundreds of studies, and it is "the most widely used instrument of moral judgment and the best documented in terms of validity and reliability" (Rest, 1990). Elm and Nichols (1993) support this assertion, stating that the reliability and validity of the DIT have been well established by research studies such as those by Davison (1979) and Davison and Robbins (1978). For example, a review of several studies by Davison and Robbins (1978) concluded that the test-retest reliability for the P-score are generally in the high .70s or .80s, and the Cronbach's Alpha index of internal consistency is generally in the high .70s (Rest, 1990).

The "full" DIT consists of six stories. The DIT (short form), which was employed in this study, contains

three stories. Its validity and reliability levels are reported to be only slightly below those of the full instrument, and its scenarios were selected based upon their having the highest correlation of any three-story set with the full six-story set (Rest, 1990). Research evidence indicates that the P-score of the short form correlate at a high level (e.g., .93 and .91) with the P-score for the full instrument (Rest, 1990).

In this study, the DIT (short form) was administered to 70 IS professionals and 94 IS students. Consistent test administration procedures were used for both samples, including the completion of the DIT on an anonymous basis. Most of the IS professionals who participated in the first study also participated in the second study; however, six professionals were not able to participate in the second study due to time limitations. The student sample was obtained from a senior-level IS

course at the same university the semester following the first study. Since this sample was obtained from students enrolled in the same course, the student sample for the second study consisted almost entirely of different individuals than those who participated in the first study.

The DIT provides an internal consistency check called an "M-score" that is designed to identify "faked" responses. It is based on subjects' endorsing certain response items that sound "lofty" and "pretentious" but which have no meaning. According to Rest (1990), selecting these items represents a subject's tendency to choose items for their pretentiousness rather than being an indication of any of Kohlberg's stages of moral reasoning. Thus, the DIT's scoring procedures require that the surveys of subjects with M-scores above a specified level be invalidated. This correction resulted in 6 observations being dropped from the sample of professionals and 13 from the student sample. As a result, the data analysis in this study is based on 64 professional and 79 student responses.

As in the first study, the demographic characteristics of the professionals and student samples were tested for significant differences. The results of these tests revealed a very similar pattern of results as the first study. As shown in Appendix B, the samples showed no significant differences regarding gender ($X^2 = 0.108$, $p = .74$), race ($X^2 = 7.350$, $p = .12$), and religion ($X^2 = 1.689$, $p = .79$). However, the mean educational levels of professionals (16.79) and students (15.60) were significantly different at the $p < .0001$ level. The estimated medians of the two samples for years of IS experience and age also were considerably different, as shown in Appendix B.

Defining Issues Test Results

The second hypothesis of this study addresses whether IS professionals and students differ significantly with regard to ethical reasoning. To evaluate this issue, the P-scores of both samples on the DIT were considered. According to the *DIT Manual* (Rest, 1990), when the purpose of a study is to compare two or more groups in terms of moral reasoning, t-tests or ANOVA are appropriate tests of significance on the DIT's P-scores. The average P-scores of IS professionals and students are presented in Table 5. As indicated, the mean score of IS professionals (38.13) was almost 22% higher than the average P-score of

students (31.35) ($F = 7.58$, $p = .007$). This difference indicates that IS professionals use the highest level of Kohlberg's model (the post-conventional level) significantly more frequently than IS students in making ethical decisions. This result is consistent with prior research. As Trevino (1992) notes, studies consistently indicate that age and number of years of formal education are positively related to principled moral reasoning scores.

	professionals	students
Mean	38.13**	31.35**
SD	14.99	14.34
n	64	79

** difference significant at $p < .01$ level ($F = 7.58$, $p = .007$)

Table 5. Mean P-Scores, Defining Issues Test

Another method of analyzing DIT test results is to compute a "group stage profile," which allows a comparison of two or more groups on their average scores for each of Kohlberg's six stages of moral reasoning. According to the *DIT Manual*, the appropriate test statistic to investigate this relationship is Multivariate Analysis of Variance (MANOVA), since the use of t-tests would violate the assumption of complete independence between stage scores (Rest 1990, p. 4.3).

The application of MANOVA in this study indicated that the stage percentage scores of the students and professionals were significantly different ($F = 3.859$, $p = .001$). In addition, ANOVA results that compared the six stage scores showed that students utilized stage 2 of Kohlberg's model (a pre-conventional morality stage) significantly more than professionals ($F = 8.736$, $p = .004$), while professionals used Kohlberg's stage 5 (a post-conventional morality stage) significantly more frequently than students ($F = 4.398$, $p = .044$). These results are consistent with the P-score outcomes reported above that professionals tend to use principled moral reasoning in making ethical decisions considerably more often than students.

Despite the possible implication from Kohlberg's taxonomy that higher P-scores are associated with "better" ethical decision making, this is an oversimplified view. One important caveat is that moral reasoning is only one part of the "equation" concerning whether or not moral behavior actually occurs in a given situation. As Rest (1990) points out, beyond ethical reasoning, moral behavior is contingent upon moral sensitivity (being able to recognize moral issues), moti-

vation (desiring to do what is right), and execution (implementing the moral decision).

Second, it is questionable whether some organizations would prefer that their employees use post-conventional reasoning (which is suggested by relatively high P-scores) rather than conventional moral reasoning (which is indicated by moderate P-scores). For example, at least one study has found evidence of an association between higher levels of moral reasoning and the propensity to engage in whistle-blowing (Brabeck, 1984). Thus, some organizations who want employees to uphold certain moral principles would likely value employees with high P-scores, while other companies who stress conformity to supervisors intentions would seemingly prefer employees with moderate or low P-scores.

Third, the P-score of the DIT is based on the use of utilitarian principles that emphasize justice and equality. It does not capture the extent to which other approaches to ethical decision making are utilized such as the "ethics of caring" (or compassion), which may also be valid bases for ethical decision making. Thus, high P-scores on the DIT do not necessarily lead to better ethical decisions. With these points duly noted, the finding of a significant ethical reasoning difference between IS students and professionals based on DIT scores is additional evidence that IS professionals appear to think about ethical issues differently from students, and this raises potential implications for the education and training of IS professionals.

Conclusions and Discussion

This investigation represents a multi-dimensional view of ethical decision making. As indicated, IS professionals demonstrated a number of ethical decision-making differences from students both in terms of "what" ethical decisions they made (i.e., for the IS ethical scenarios in study one) and "how" they tended to justify their ethical decisions (as assessed by the DIT in study two). These results support various theoretical models of ethical decision making (e.g., Bommer et al., 1991) that ethical decision-making differences will arise between samples based on differences in age, years of professional work experience, and educational level – factors upon which the samples in this study differed.

The results are also consistent with at least two prior comparative decision-making studies of business students versus professionals. Ashton and

Kramer (1980) found that students demonstrated significant differences from professionals in about one-third of the 32 internal auditing cases they examined. An additional study by Hughes and Gibson (1991) on DSS decision making found that students and professionals differed on some tasks while showing no difference on others, leading the authors to conclude that student versus professional differences appear to be task-dependent.

From a research perspective, the results of this study raise a question about the appropriateness of using students as surrogates for professionals for ethical decision making tasks. As reported, the judgments of students differed significantly from professionals on two of seven measures in study one, and they were marginally significant for two additional measures. In addition, IS students and professionals scored markedly different in terms of their moral reasoning as measured by the Defining Issues Test. Taken together, these findings suggest that differences in ethical decision making between IS students and professionals occur with sufficient frequency that researchers should exercise substantial caution in generalizing their ethical decision making results from student samples to professionals in the workplace.

The findings of this study also suggest the importance of providing ethical training and education to IS students and professionals. Consistent with the results of Conger et al. (1995), this study found a lack of consensus among respondents about most IS ethical scenarios. This provides confirming evidence of the complex nature of IS ethical decision making. Moreover, the observed differences between professionals and students indicates that people have a tendency to view many ethical situations differently based on their experience.

Effective ethical problem solving entails the ability to identify ethical issues, affected parties, the potential consequences of actions, and one's professional or moral duties to arrive at well-reasoned, ethically-defensible positions. However, the results of this study suggest that people may have a tendency to view ethical issues from an egocentric point of view, thereby oversimplify situations or failing to consider alternatives, stakeholders, consequences, or one's duties.

Consequently, ethical training and education can benefit students and professionals by expanding their awareness and sensitivity about ethical problem solving. This includes increasing awareness

of the types of ethical dilemmas that are encountered in the workplace and the sources of guidance that are available for resolving these issues, such as professional codes of conduct, company codes of conduct, supervisory assistance, and different ethical "schools of thought." Just as people can develop improved problem solving skills in other domains through practice, so too can they heighten their ability to confront and arrive at well-reasoned, defensible position to ethical problems through expanding their experience with them.

According to Parker (1988), IS students in universities as well as IS professionals in the workplace may benefit from increased attention to ethics through readings, briefings, or training programs. Similarly, Solomon (1993) notes that the study of business ethics can be useful in instilling a greater "sense of confidence in one's ability to face and handle practical situations." While ethics training is not likely to be successful in teaching people that there is a "neat" difference between right and wrong, it can help people feel more comfortable facing moral complexity, through an improved ability for reflection and a deeper understanding of business practices (Solomon, 1993). As a result, IS professionals and students may be more capable of recognizing ethical situations when they arise and be more effective at ethical problem solving.

Future Research Directions

Researchers are encouraged to extend this study by investigating ethical decision making in an information systems context using additional samples, research methods, and tasks. One potentially fruitful option for future research is to replicate this study using MBA students as opposed to undergraduates. Since fewer background differences exist between graduate students and IS professionals in terms of important characteristics such as education, age, and work experience, this may lead to little or no significant decision-making differences between these samples. If so, this would suggest that MBA students can serve as valid surrogates for IS professionals in an ethical decision making context.

A second avenue for further research is to use alternative research methods to enhance our knowledge about this domain. Business ethics research has predominantly used survey research,

and qualitative research techniques have been used only sparingly (Randall and Gibson, 1990). Thus, there is a need to "triangulate" our knowledge of IS ethical decision making with qualitative techniques such as in-depth interviews (Jick, 1979; Robertson, 1993). This approach would be particularly helpful in allowing researchers to probe ethical decision-making processes in a way that surveys typically do not. As a result, researchers could cross-validate the data derived from survey studies, and this would ultimately lead to an enriched explanation of IS ethical decision making and improved theoretical models of it.

In addition, since evidence suggests that ethical decision making is task-dependent (to at least some extent), future studies should continue to vary the range of ethical decision making tasks investigated. By accumulating a larger body of evidence, researchers will be more enabled to identify patterns that can further our understanding of ethical decision making processes and outcomes in a way that will advance decision theory and be meaningful to practitioners.

Finally, it should be noted that this study assessed *perceptions* about ethical issues, which do not necessarily relate to *behaviors*. Thus, further research, examining the relationship between ethical perceptions and behavior, would be worthwhile in developing a better understanding about how training might be beneficially used to raise the ethicality in reasoning and behavior.

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highly ethical HE	moderately ethical ME	slightly ethical SE	don't know/ no opinion DK	slightly unethical SU	moderately unethical MU	highly unethical HU
the action is very ethical; there is little or no question about it	the action is predominantly ethical, even though some elements of questionable ethics may be present	the action is slightly more ethical than it is unethical	I don't know or I have no opinion	the action is slightly more unethical than it is ethical	the action is predominantly unethical, even though some ethical elements may be present	the action is very unethical; there is little or no question about it

Appendix A. Response Scale for IS Ethical Scenarios

	Professionals		Students		X² or t	p
GENDER						
Male	67.2 %		64.6 %		X² = 0.108	.74
Female	32.8 %		35.4 %			
RACE						
White	85.2 %		70.5 %		X² = 7.350	.12
Asian/Pacific Islander	8.2 %		10.3 %			
Hispanic	4.9 %		5.1 %			
Black	1.6 %		11.5 %			
American Indian	0.0 %		2.6 %			
RELIGION						
Protestant	52.7 %		48.1 %		X² = 1.689	.79
No affiliation	21.8 %		21.5 %			
Catholic	21.8 %		21.5 %			
Jewish	0.0 %		1.3 %			
Other	3.6 %		7.6 %			
EDUCATION	mean	16.79	mean	15.60	t = 5.01	< .0001
	SD	1.91	SD	0.76		
YEARS OF IS EXPERIENCE						
	< 3	16.1 %	none	49.4 %	n/a	n/a
	3-5	10.7 %	0.1-0.99	19.0 %		
	6-10	19.6 %	1.0-2.0	13.9 %		
	11-15	26.8 %	2.1-3.0	7.6 %		
	over 15	26.8 %	3.1-5.0	7.6 %		
	over 15	26.8 %	over 5	2.5 %		
	median (est.): 11.67 yrs		median (est.): 0.03 yrs.			
AGE						
	29 or less	16.4 %	< 23	22.8%	n/a	n/a
	30-39	50.8 %	23-28	49.4 %		
	40-49	22.9 %	29-35	21.5 %		
	50-59	9.8 %	36-45	6.3 %		
	60-over	0.0 %	46-over	0.0 %		
	median (est.): 36.61 yrs.		median (est.): 25.75 yrs.			

Appendix B. Demographic Characteristics (Study Two)