Fall 1994

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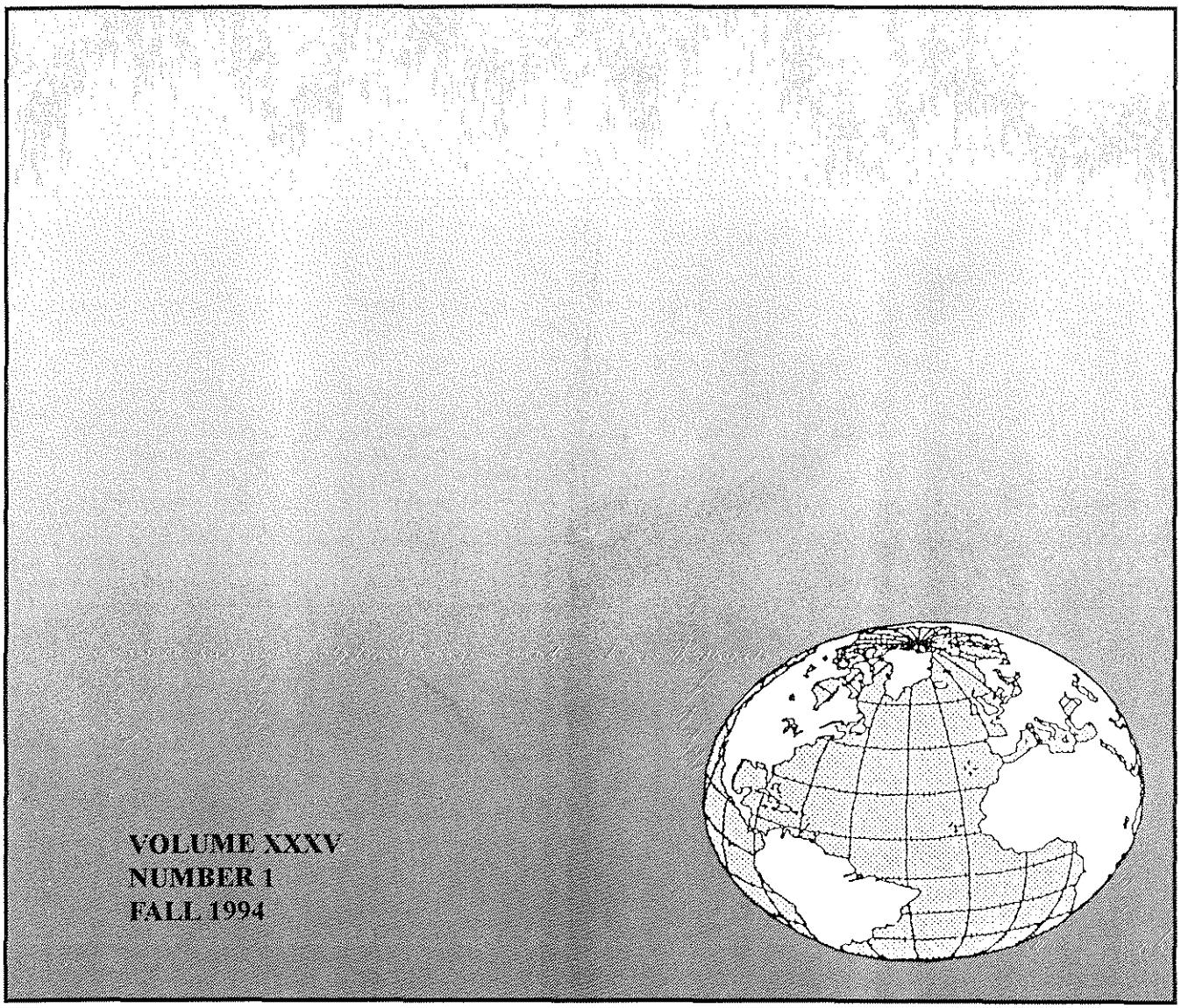
JOURNAL OF COMPUTER INFORMATION SYSTEMS

official journal of

INTERNATIONAL ASSOCIATION FOR COMPUTER INFORMATION SYSTEMS



VOLUME XXXV
NUMBER 1
FALL 1994

JOURNAL OF COMPUTER INFORMATION SYSTEMS

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Volume XXXV • Number 1

DOES PEDAGOGY MAKE A DIFFERENCE?: AN EXPERIMENTAL STUDY OF UNETHICAL BEHAVIOR IN INFORMATION SYSTEMS

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INTRODUCTION

In the past few years ethics education has received increasing attention from the business and academic communities. Many have instituted pedagogical programs for increasing awareness of ethical issues, ethical norms and codes of conduct in different professions. It appears that both researchers and practitioners are in agreement about the need for providing adequate ethics education to managers (13, 20, 9). This has become especially important in the context of the information systems (IS) discipline. Proliferation of information and communication technologies has raised many questions on what constitutes ethical managerial behavior. Researchers have reported that the existence of a computer-based information system in the context of an ethical dilemma appears to influence the ethical decision-making process differently than in non-IS related tasks (17, 22).

RESEARCH RATIONALE AND HYPOTHESIS

There appears to be a growing consensus within the IS profession that education regarding the ethical aspects of information systems is crucial for mitigating the recurring problems of unethical (illegal or otherwise unacceptable) activities in the development and use of information technology (9, 17). In this vein, Bickel and Bush (6) assert that "...educational psychologists and computer professionals agree that education on the ethical use of computers is a critical avenue for attacking computer crime." But, before establishing ethical education programs and business ethics courses, it is important to discern whether pedagogical solutions have the ability to influence (or alter) managerial behavior. Mere use of pedagogical approaches for ethics education and/or sensitization of IS professionals and students could be an inadequate remedy for a problem that may have a larger societal context (13, 16). For instance, the Dean of the Kellog School of Management at Northwestern University argues that "you learn ethics at home. ...No matter how much schools of business expand their investment in moral instructions most education in business ethics will occur in organizations in which people spend their lives" (10 quoting 3).

The previous arguments are not new to the social sciences; Aristotle was one of the earliest philosopher-scientists to expound on the problem(s) of teaching Ethics in his treatise entitled *Nicomachean Ethics*. He reasoned that teaching ethics would not be beneficial because "moral behavior is acquired by habituation." Aristotle cautioned about relying on ethics instruction asserting that "...argument and teaching, [I am afraid], are not effective in all cases: the soul of the listener must first have been conditioned by **habits** to the right kind of likes and dislikes, just as land <must be cultivated before it is able> to foster the seed. For a man whose life is guided by emotion will not listen to an argument that dissuades him, nor will he understand it" (1962 translation, p. 295; emphasis added). Numerous studies, according to Wooster (24), have consistently failed to provide any conclusive evidence to support any particular approach to improving the ethical behavior of school students. He quotes two streams of work on ethical instruction done by educational psychologists called the "values clarifiers" school and "just community" or "moral dilemma" school. The former group hoped to ensure that students could be able to figure out their own values, whereas the latter clustered around the work based on Kohlberg's ideas of staged moral development. The work of both schools of thought did not produce any significant assurance regarding the benefits of ethics education approaches. In fact, Wooster contends that even these character educators and think tanks such as the American Institute for Character Education, San Antonio, Texas, and the Thomas Jefferson Research Center of Pasadena, California, admit that there is little evidence that their programs actually build character.[1]

On the other hand, when 150 new business graduates were surveyed regarding the value of ethics education, 92% indicated that ethics should be emphasized in undergraduate lectures, and 86% attached a great degree of importance to having some undergraduate business ethics education (10).[2] In the same study, when asked what actions are most effective for imparting ethical values to students, 59% supported a lecture and/or seminar on ethics, and a similar number (50%) supported the use of case studies. Furthermore, 60% stressed the importance of "ethical" faculty behavior, and 43% felt that a course in business ethics could be two other constructive

[1] Wooster (1990) states that these two think tanks have claimed that their ethics instruction curriculums and publications are being used in a total of 74,000 classrooms across the USA. Regarding the duration of such ethics programs, he asserts that "[T]he programs are shorter: a Thomas Jefferson Research Center brochure promises that it takes **ten** minutes a day to build character" (p. 54; emphasis added).

[2] Similar results were also reported by Poorsoltan et al. (1991) and Forcht (1991) in their surveys of the perceptions of upper-division business administration students and CEOs of *Datmation 100* companies worldwide.

activities for imparting good values to business students. Interestingly though, David et al. quote some dissenting respondents as stating, "By the time a student reaches college age, values taught in home (and on TV) have solidified. College ethics courses are not going to change a person's moral character;" and "...By the time a person goes to college, it would be very difficult to change their values. I think students only receive reinforcement for their ethical system out of college ethics education. Trying to teach a system of ethics is a waste of time and money."

The motivation of this research stems from the previous discussion and especially from Cougar's (9) exhortation to IS researchers to analyze whether pedagogical approaches can be effective in encouraging ethical behavior in the work place. In addition, there appears to be no systematic empirical support for the notion that ethics education (using one or more of either personalized scenarios, lectures, seminars, case studies or an ethics course) can improve the ability of managers to identify (and, hopefully resist) unethical behavior in information systems. In the area of clinical assessment of moral development, Burton and Casey (7) summarizing past research findings, contend that education, measured in terms of intelligence and academic ability, correlate moderately with honesty on experimental tasks. On the other hand, in a study of business students, researchers have found some evidence to show that students who had a previous ethics course changed their opinions (regarding an ethical dilemma) with approximately the same frequency as those who had not (6).

RESEARCH HYPOTHESIS

The objective of this research is to question and clarify the conventional wisdom that ethics education and increased awareness of professional norms and codes of conduct in the IS discipline can improve the ability of decision makers to recognize unethical actions and ultimately resist them. Thus, the overall hypothesis stated in null form is as follows:[3]

H_0: Individuals with no pedagogical exposure to ethical aspects of information systems (μ_{np}) are able to recognize unethical actions as well as those with pedagogical instruction (μ_p). That is, H_0: $\mu_{np} = \mu_p$ and H_1: $\mu_{np} \neq \mu_p$.

A secondary issue relating to this hypothesis is the question of whether statistically significant differences, if any, continue to persist when specific categories of ethical dilemmas in Information Systems are considered.

METHOD

Subjects and Setting

The subjects for the study were 40 undergraduate and graduate business students (22 women and 18 men) enrolled in different sections of a college-wide course on management information systems (MIS) at a Midwestern university.[4] A large number (65%) were upper-division undergraduate students (junior/senior), and the rest (35%) were split between either lower-division (freshman, sophomore and unknown) or graduate students (pre-MBA, MBA and other). Student graduate point averages varied between 2.50 to 4.00, with a mean of 3.26. A majority of the students (68%) had completed between one to three courses relating to computer technology and/or information systems, with approximately 18% having completed at least one class. The remaining students (32%) were equally distributed between those who had completed three to five courses and those who had taken more than five classes. In terms of years of full-time experience, subjects reported a range between 3 months to 138 months (μ = 48.2). In addition, subjects ranged between 1 month to 120 months of part-time work experience (μ = 54.4).

Procedure

In lieu of an announced business ethics course, 20 students enrolled in one section of the MIS class received pedagogical instruction on ethical aspects of information systems and computer technology development and use. This involved a three-hour class using a combination of different pedagogical approaches recommended by Cougar (9) and others referenced earlier. First, students were given a brief lecture on the notion of ethics. They were told the meaning of the term ethics and the need for ethics in the field of IS. It was emphasized that ethical behavior was more than just legal behavior; it implies, in addition, conforming to the governing moral standards and code of conduct of society, given organization, university, and profession (21, 23). Next, the students were introduced to the governing codes of conduct of the information systems profession -- the ACM and DPMA codes of conduct. Finally, situations from university experiences and some of the ethical dilemmas described in Parker (18) were used to discuss and argue various ethical issues that arise in the context of information technology use and development. In addition, students were asked to read Allen's (1) article "Embezzler's Guide to the Computer" for discussion in class. The situations described in this article were also incorporated into the discussion of the professional codes of conduct and provided a good illustration of some clearly illegal actions. Two weeks later, all the subjects completed a survey that measured their ability to independently recognize unethical behavior in a set of selected scenarios.

The control group for the present study consisted of 20

[3] Greenwald (1975, p. 16) advocates that "...a research question stated in null hypothesis form is especially appropriate for theory-testing research. In such research, a result that can be used to accept a null hypothesis may often serve to advance knowledge by disproving the theory."

[4] Positing **large effect sizes** (ES = 0.80 to 1.0), a statistical power of 0.80 or more, (i.e., a 80% chance of rejecting the null, when it is false) and a level of significance of 0.05 (i.e., a 95% chance of accepting the null when it is true), a sample size between 20 and 27 is recommended by each group (8, p. 34).

Alternatively, in order to be very sure to detect a true association when the treatment group accounts for 20% or more of the variance (W^2) of the dependent variable, Hays (15, pp. 419-20) has deduced a relationship between this variance (w^2) and the sample size (**n**) for each group (control or treatment). He shows that sample size is given by the relationship: $n = 2^* (Z_{(1-\alpha/2)} - Z_{(\beta)}] / \delta^2]$ where n, α, β have their usual meanings; and, $\delta^2 = w^2/(1-w^2)$ where w^2 is the amount of variation explained by the true association of the treatment and the dependent variable. Using a significance level (α) of 0.05 and a statistical power (1-β) of 0.80, **n** approximately calculates to 16. Hays recommends taking a sample that is somewhat larger than this estimate. Thus, *the decision to employ a sample size of **20** for each group (control and treatment) implies that there is a 95% probability of finding a statistically significant result when the true proportion of variance accounted for by the treatment is as small as **0.114 or 11.4%*** (15, p. 423).

randomly selected students from other sections of the MIS course. These subjects were not provided any pedagogical exposure to ethical aspects of IS elaborated previously. Each member of this group also responded to the same survey given to the first group of subjects. A comparison of the descriptive statistics for the control and treatment group shows that subjects were, to a large extent, comparably distributed in terms of demographic characteristics such as gender, status, information systems courses completed, grade point average, full-time experience and part-time experience. Thus, the control group consisted of 12 women and 8 men with 55% being upper-division undergraduate students, and the rest distributed between either lower-division or graduate students. Whereas, the treatment group consisted of an equal number of women and men with 40% upper-division and the remaining distributed between lower-division and graduate students. The grade point average of students in the control group varied between 2.8 to 4.0 ($\mu = 3.27$, $\sigma = 0.35$) compared with 2.5 to 3.8 ($\mu = 3.25$, $\sigma = 0.39$) for the treatment group. A majority of the students (65%) in the control group had completed one to three courses. A similar number (72%) were also present in the treatment group. In terms of full-time work experience, subjects in the control group ranged from 3 to 138 months ($\mu = 55.8$, $\sigma = 44.3$) and those in the treatment group varied between 12 to 66 months ($\mu = 39.2$, $\sigma = 20.1$) of experience. Finally, subjects in the control group ranged between 24 to 120 months of part-time work experience with a mean of 56.3 ($\sigma = 31.2$). In contrast those in the treatment group ranged between 1 to 96 months of part-time work experience, with a mean of 52.7 ($\sigma = 28.1$).

Dependent Variable

The dependent variable for this study was measured by assessing the ability of subjects to recognize the "degree of unethicalness" of actions described in a set of seven short scenarios. The scenarios describe cases involving unethical actions in the information systems and/or computer technology context and have been adapted from Parker (18). Each scenario is a representative example of the seven types of ethical situations categorized by Parker: "*...the classification looks at ethical norms from an individual's point of view.*" These categories are comprised of the ethical responsibilities of IS professionals regarding disclosure, social responsibility, integrity, conflict of interest, accountability, protection of privacy and personal conduct. A detailed explanation of each category of ethical dilemma in Information Systems is provided in Appendix A. Parker used expert judges from various disciplines (technologist, manager, ethical philosopher, academic, lawyer, etc.) to evaluate 32 ethical dilemmas. Seven of these scenarios representing each category of ethical dilemma and an associated "degree of unethicalness" rating scale were used for the present study (refer to Appendix B for the instrument). The behavior of the actors in each of these scenarios was considered to be absolutely unethical by an overwhelming majority of Parker's expert judges. The resulting scores of the expert judges along with Parker's classification of each scenario is also provided in Appendix B.

The unethical acts described in each scenario were rated by the subjects on a 7-point Likert-type interval scale ranging from "absolutely not unethical" = 1 to "absolute unethical" = 7, with no verbal labels for intermediate scale points (i.e., 2 through 6). Thus, the "aggregate degree of unethicalness" of the actions described in the scenarios could range from a maximum of 49 (7*7) to 7 (7*1). Since a majority of Parker's expert judges rated the actions in each scenario to be absolutely unethical, the ability of a subject to recognize unethical behavior can be considered to be closer to the experts if they receive an aggregate score that tends to the higher side of the scale -- that is, between 28 (middle scale value) and 49.[5]

Results and Discussion

The overall research hypothesis was statistically analyzed using the SAS t-test procedure for two independent samples. (The same results are obtained with an one-way analysis of variance procedure.) Results indicate that although the mean scores for both the control and experimental groups are relatively high, they are not very close to the expert judgments regarding the actions described in the scenarios.[6] The two samples have unequal variances (H_0: Variances are equal; $F = 4.88$; p-value = 0.0011) requiring the use of the Satterthwaite test for inferencing about differences in means with unequal variances. This test resulted in a *failure to reject the null hypothesis* at the 5% level of significance (t-statistic = 1.71; p-value = 0.0996). Thus, it can be concluded that individuals receiving no education in ethical aspects of information systems are able to identify unethical actions in scenarios **no better than** (or as well as) those receiving some formal pedagogical instruction. It should be noted that the mean score for the group receiving pedagogical ethics education was higher than that of the control group -- suggesting some influence of the pedagogical instruction. But, this could very well be due to the immediacy of the measurement (survey) to the ethics (pedagogy) treatment.

The previous conclusion is further reinforced by a detailed analysis of the research hypothesis for each of the seven categories of ethical dilemmas. Using disaggregated scores for the "degree of unethicalness" of actions described in each scenario, individual t-tests indicate that the **null hypothesis** is soundly **not rejected** for six out of seven cases. The lone exception to this overall finding provides confirmatory evidence for the experimental hypothesis (i.e., rejecting the null) that pedagogical ethics education may result in a statistically significant difference in an individual's ability to recognize unethical actions regarding issues involving a "conflict of interest" dilemma. Table 1 details the results for each category of ethical dilemma.

CONCLUDING REMARKS

Limitations

Although internal validity is fully controlled in the design

[5] It should be noted that each of Parker's expert judges were asked to respond whether the action(s) described in a particular scenario was either "absolutely unethical", "absolutely not unethical" or "not an ethics issue." In five of the seven scenarios adapted for the present study, the expert verdicts regarding the unethicalness of the actions was nearly unanimous (greater than 90% agreeing), with the remaining two cases being voted as "absolutely unethical" by a majority (greater than 80% agreeing) of the experts.

[6] The mean score for aggregate "degree of unethicalness" for the group receiving pedagogical instruction is **35.8** ($\sigma = 3.46$) and **32.6** ($\sigma = 7.64$) for the control group.

used for this study, external validity of the results are always susceptible to the interaction of subject selection and treatment (pedagogy). The use of undergraduate and graduate business students in a "quasi-laboratory" setting also raises some questions of external validity. However, on the average, study subjects had extensive full-time and part-time work experience and had completed a relatively large number of information systems and/or computer science related course work. Another potential limitation could be the inherent assumption that the assignment of students to the course section receiving pedagogical instructions is basically random in nature and that the population distributions of each group are normal in nature. This is not a critical problem in that the two-tailed t-test employed in the study is considered to be quite robust. For instance, Hayes (15, p. 410) concludes that in using the t-test for two independent samples, "...the departure from normality can make more difference in a one-tailed test than in a two-tailed result;" and that "[B]y and large, ...this assumption (of a normal distribution in the populations) may be violated with impunity provided that sample size is not extremely small."

TABLE 1
Individual t-tests for Disaggregated "Degree of Unethicalness" Scores

Type (or Category) of Ethical Dilemma	H_0: Variances are equal	t-statistic & p-value	Mean Disaggregated "Degree of Unethicalness" Score	
			Control Group	Treatment Group
S1: Disclosure	p = 0.41; Variances equal	t = 0.106; p = 0.916	5.75 (σ = 1.62)	5.70 (σ = 1.34)
S2: Social Responsibility	p = 0.88; Variances equal	t = -0.767; p = 0.448	4.95 (σ = 1.47)	5.30 (σ = 1.42)
S3: Integrity	p = 0.72; Variances equal	t = 0.967; p = 0.339	6.40 (σ = 1.10)	6.50 (σ = 1.19)
S4: Conflict of Interest	p = 0.23; Variances equal	t = -3.08; p = 0.004[9]	3.40 (σ = 2.09)	5.20 (σ = 1.58)
S5: Accountability	p = 0.43 Variances equal	t = -0.775; p - 0.443	4.90 (σ = 1.55)	5.25 (σ = 1.29)
S6: Protection of Privacy	p - 0.36; Variances equal	t = -0.879; p - 0.358	4.15 (σ = 1.98)	4.65 (σ = 1.60)
S7: Personal Conduct	p = 0.62; Variances equal	t = -0.926; p = 0.36	3.05 (σ = 2.16)	3.65 (σ = 1.93)

[9]This is significant at the 0.05 alpha-level.

Implications for Research and Practice

The overall findings in this article imply that pedagogy may not have a significant effect on a person's ability to recognize (and ultimately resist) unethical actions involving IS dilemmas. It may well be possible to pedagogically modify managerial behavior to fit the organizational, social and professional norms of ethical behavior, but it appears that ethics education courses are not necessarily the answer. The results of this study, at a minimum, provide evidence that falsifies the generally held belief ("theory") that pedagogical ethics education can have a lasting influence on an individual's ability to recognize and resist unethical actions. It must be emphasized that this conclusion is not necessarily unsatisfactory. As Greenwald (14) rightly maintains that in theory-testing research, "a result that can be used to accept a null hypothesis may often serve to advance knowledge by disproving the theory." He further recommends "*a suggested attitude change of researchers (and editors) toward the null hypothesis. Support for the null hypothesis must be regarded as a research outcome acceptable as any other* (p. 16, Italics in original).

Decisions involving ethical dilemmas are personal acts, and the ability to recognize "right" from "wrong" or "good" from "bad" may be more a matter of training and habituation (as Aristotle realized many years ago) than education. John Akers, Chairman of the Board of IBM, has contended that "... although business schools can and should engage in some forms of ethical instruction, the work cannot begin--or end--there. Instruction must begin in childhood and encompass such practical devices as role models and codes of conduct (2). Of course, the authors do not recommend that ethics education be abandoned--philosophical introspection of ethical/unethical situations should be an essential component of the learning process in any discipline; but the whole notion of using pedagogical approaches to modify managerial behavior needs to be thoroughly reexamined.

Corporations interested in teaching managers to recognize

unethical actions need to rethink their approaches. In addition to clear communication of corporate policies regarding ethics, strong punishment (reward) systems may be the answer to discouraging (encouraging) unethical (ethical) behavior (23). Ethical managerial behavior in any discipline may ultimately depend upon the individual strength of the decision maker. It is difficult to see how an individual who understands and successfully uses complex information technologies cannot determine the "rightness" or "wrongness" of a given action. The final arbiter of all ethics are the individuals themselves. They have to, in the long run, establish their own personal ethical standards. The following commentary sums up the implications of this study quite succinctly.

Can Ethics Be Taught?

> The typical ethics course centers on the case study... One would suppose the graduate, having mastered the regimen, is able to recognize (and resist) a dubious deal or an improper request from a superior... Unfortunately, this conclusion rests on a mistake about what makes people good. Moral behavior is the product of training, not reflection. As Aristotle stressed thousand years ago, you get a good adult by habituating a good child to doing the right thing. Praise for truth-telling and sanctions for fibbing will, in time, make him "naturally" honest... Abstract knowledge of right and wrong no more contributes to character than knowledge of physics contributes to bicycling. Bicyclists don't have to think about which way to lean, and honest people don't have to think about how to answer under oath.....
>
> A complex world does present special moral puzzles, and there is certainly a place for philosophical reflection. But ethics courses are pointless exercises. Telling right from wrong in everyday life is not that hard; the hard part is overcoming laziness and cowardice to do what one perfectly well knows one should. As every parent learns, only good examples and apt incentives can induce that strength. (Excerpted from Levin, 1990).

REFERENCES

1. Allen, B. "Embezzler's Guide to the Computer," **Harvard Business Review,** July-August 1975, pp. 79-89.
2. Akers, J. "Ethics and Competitiveness--Putting First Things First," **Sloan Management Review,** 30, Winter 1989, pp. 69-71.
3. Andrews, K. "Ethics in Practice," **Harvard Business Review,** 67:5, Sept.-Oct. 1989, pp. 99-104.
4. Aristotle. **Nicomachean Ethics** (English translation). Bobbs-Merril, Inc., Indianapolis, IN, 1962.
5. Baroudi, J.J. and W.J. Orliwoski. "The Problem of Statistical Power in MIS Research," **MIS Quarterly,** 10:1, March 1989, pp. 87-106.
6. Bickel, R.W., M.M. Larrondo-Petrie, and D.F. Bush. "EDICT: A Tool to Assist Computer Ethics Education," **IBSCUG Quarterly,** 2:4, Winter 1991, pp. 13-24.
7. Burton, R.V. and W.M. Casey. "Moral Development." In Woody, R.H. (General Ed.), **Encyclopedia of Clinical Assessment,** Vol. 1, Jossey-Bass Publishers, San Francisco, CA, 1980, Ch. 26
8. Cohen, J. **Statistical Power Analysis for the Behavioral Sciences.** Academic Press, Inc., New York, NY, 1969.
9. Cougar, J.D. "Preparing IS Students to Deal with Ethical Issues," **MIS Quarterly,** 10:2, June 1989, pp. 211-218.
10. David, F.R., L.M. Anderson, and K.W. Lawrimore. "Perspectives on Business Ethics in Management Education," **SAM Advanced Management Journal,** 55:4, Autumn 1990, pp. 26-32.
11. Dejoie, R., G. Fowler, and D.B. Paradice. **Ethical Issues in Information Systems,** Boyd & Fraser Publishing Company, Boston, MA, 1991.
12. Forcht, K.A. "Assessing the Ethical Standards and Policies in Computer-based Environments." In Dejoie, R.M., G.C. Fowler, and D.B. Paradice, **Ethical Issues in Information Systems,** Boyd and Fraser Publ. Co., Boston, MA, 1991, pp. 56-69.
13. Gellerman, S.W. "Why 'Good' Managers Make Bad Choices," **Harvard Business Review,** 64, July-August 1986, pp. 85-90.
14. Greenwald, A.G. "Consequences of Prejudice Against the Null Hypothesis," **Psychological Bulletin,** 82:1, January 1975, pp. 1-20.
15. Hays, W.H. **Statistics for the Social Sciences,** Holt, Rinehart and Winston, Inc., New York, NY, 1973.
16. Levin, M. "Can Ethics be Taught?," **Reader's Digest,** 136:815, March 1990, pp. 113-114.
17. Paradice, D.B. "Ethical Attitudes of Entry-Level MIS Personnel," **Information & Management,** 18, 1990, pp. 143-151.
18. Parker, D.B. **Ethical Conflicts in Computer Science and Technology,** AFIPS Press, Arlington, VA, 1980.
19. Poorsoltan, K., S.G. Amin, and A. Tootoonchi. "Business Ethics: Views of Future Leaders," **SAM Advancement Journal,** 56:1, Winter 1991, pp. 4-9.
20. Saul, G.K. "Business Ethics: Where Are We Going?," **Academy of Management Review,** 6:2, April 1981, pp. 269-276.
21. Schermerhorn, Jr., J.R. **Management for Productivity,** Third Edition, John Wiley, Inc., New York, NY, 1989.
22. Taylor, G.S. and J.S. Davis. "Individual Privacy and Computer-Based Human Resource Information Systems," **Journal of Business Ethics,** 8:7, July 1989, pp. 569-576.
23. Trevino, L.K. and S.A. Youngblood. "Bad Apples in Bad Barrels: A Causal Analysis of Ethical Decision-Making Behavior," **Journal of Applied Psychology,** 75:4, August 1990, pp. 378-385.
24. Wooster, M.W. "Can Character Be Taught?: How We've Tried and What We've Learned," **The American Enterprise,** 1:6, 1990, pp. 51-55.

APPENDIX A: CATEGORIES OF ETHICAL DILEMMAS IN IS[7]

DISCLOSURE
Obligation not to divulge confidential or private corporate knowledge or information to competitors or individuals; Not use the resources of employer(s) for personal gain or for any purpose without explicit approval.

SOCIAL RESPONSIBILITY
Obligation to be socially responsible in the use and dissemination of information; Not withhold or misrepresent information that is germane to a problem or situation of public concern; To the best of my ability, insure that the products of my work are used in a socially responsible way.

INTEGRITY
Obligation to act with integrity or honesty at all times; Not use or take credit for the work of others without specific acknowledgment and authorization.

CONFLICT OF INTEREST
Obligation to avoid conflict of interest and insure that employers or clients are aware of any potential conflicts; At all times act faithfully in behalf of employers or clients.

ACCOUNTABILITY
Obligation to take appropriate action in regard to any illegal or unethical practices that come to my attention; Accept full responsibility for work that I perform; Not misuse authority entrusted to me.

PROTECTION OF PRIVACY
Obligation to protect the privacy and confidentiality of all information entrusted to me; Not use knowledge of a confidential or proprietary nature in any unauthorized manner or to achieve personal satisfaction or personal gain.

PERSONAL CONDUCT
Not exploit the weakness of a computer system for personal gain or personal satisfaction; Be honest in all professional interactions; Not take advantage of the lack of knowledge or inexperience on the part of others; Endeavor to share my special knowledge; Not misrepresent or withhold information concerning the capabilities of equipments, software or systems.

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[7]The seven categories of unethical behavior in Information Systems (IS) explicated here have been adapted from Parker [1980]. The definitions of each type of ethical dilemma incorporate a majority of the notions established in the codes of ethics, cannons or code of professional conduct established by the DPMA (Data Processing Management Association) and ACM (Association of Computing Machinery).

APPENDIX B: UNETHICAL BEHAVIOR INSTRUMENT[8]

Scenario 1:
A computer programmer was seeking new employment, unknown to her current employer. At times when she was unobserved, she made copies of the listings and documentation of programs she had written for her employer, and she used these examples of her work.

In one case, where she knew there would be no direct harm done, she gave the examples as part of her resume to a prospective employer. However, she also showed them to another prospective employer, who gained from them significant knowledge, which gave him a competitive advantage over the programmer's employer.

Degree to which you believe that the programmer's act of taking a copy of her programming work and showing them to prospective employers is unethical

Absolutely 1 2 3 4 5 6 7 **Absolutely**
Not Unethical **Unethical**

[**S1:** Classification = DISCLOSURE; 26 out of 26 judges found the programmer's action to be unethical].

Scenario 2:
At a time when experts where beginning to question the merits of current agricultural practices, a researcher used computer-modeling techniques to predict that a global agricultural disaster would occur in fifty years. To stimulate public concern and debate about agricultural practices, he published his prediction in a low-priced, mass-market paperback. The book emphasized the role of the computer in making this prediction, for example, by including computer-generated graphs and illustrations. But the book did not discuss the fact that the prediction depended on debatable assumptions and selection of data, and could be radically different, with a slight change of assumptions. Being unaware of these facts, the general public accepted the dramatic predictions as indisputable and objective, in significant part because it came from a computer, and the public became deeply concerned with agricultural practices.

Degree to which the researcher's act of misrepresenting the facts is unethical

Absolutely 1 2 3 4 5 6 7 **Absolutely**
Not Unethical **Unethical**

[**S2:** Classification = SOCIAL RESPONSIBILITY; 26 out of 26 experts found the researcher's action to be unethical].

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[8]Each scenario was rated by respondents on a Likert-type interval scale, ranging from a 1 to 7. Respondents were instructed to evaluate the action described in the scenarios in terms of the degree of the degree of "unethical behavior" or "unethicalness" involved. Thus, circling **1** implied that the action described in the scenario was **clearly not unethical**; and selecting the **7** meant that the act was judged to be **absolutely unethical**. Respondents were asked to use the in-between numbers (2-6) for in-between "degrees of unethicalness" -- the higher the number the more unethical the action becomes.

Scenario 3:
A professor of computer science at a university developed a new computer programming language for a range of computer applications. Two of his graduate students tested the language for consistency and completeness. They discovered and corrected several significant shortcomings and added several new features. A programmer on the staff of the university's computer center programmed the compiler for the language. He discovered flaws in the syntax and corrected them, with the permission of the professor. He also found ways to change the language that improved the performance. The graduate students and professor documented the language, and they wrote a user's manual.

The professor compiled the writings into a scientific paper and published it under his own name alone, with no acknowledgment of the contributions of the graduate students or the programmer.

Degree to which the professor's act of producing a paper without acknowledgments is unethical.

Absolutely Not Unethical 1 2 3 4 5 6 7 **Absolutely Unethical**

[**S3:** Classification = INTEGRITY; 28 out of 30 judges found the professor's action to be unethical].

Scenario 4:
Company A invited a consultant to submit a proposal to develop a computer program based on explicit program specifications. The consultant is currently programming the same application for Company B, based on far superior specifications that will give it a significant competitive advantage over Company A. The consultant submits a proposal to Company A without mentioning that the specifications are already inferior to the competing product.

Degree to which the consultant's act of bidding on an inferior program while furnishing another client a superior program is unethical.

Absolutely Not Unethical 1 2 3 4 5 6 7 **Absolutely Unethical**

[**S4:** Classification = CONFLICT OF INTEREST; 20 out of 26 experts found the action to be unethical].

Scenario 5:
A computer operations manager has responsibilities that include data preparation and entry, computer operation, computer security, report generation and distribution. The top executive officers of the company are engaged in a massive fraud against the stockholders and other investors by inflating company assets. Significant evidence of the fraud is contained in the data files stored and processed by the computer, and computer programs have been developed to assist in the perpetration of the fraud.

The computer operations manager becomes aware of the company's problems and unorthodox methods being used to solve them. He avoids being confronted with information or activities that might make him aware of possible wrongdoing.

The fraud is ultimately discovered and the perpetrators prosecuted. The prosecutor requires the operations manager to make a deposition. He states that he was ordered to perform unorthodox and unexplained acts, such as leaving large numbers of product shipment addresses blank, or making them all the same in the data entry function. He claims he was not, nor would be expected to be, aware of the purposes of the acts. He stated that his was a neutral service function, not requiring any knowledge of the company's business. He was not prosecuted.

Degree to which the operations manager's failure to act on indications of company fraud is unethical.

Absolutely Not Unethical 1 2 3 4 5 6 7 **Absolutely Unethical**

[**S5:** Classification = ACCOUNTABILITY; 29 out of 30 experts found the operation manager's action to be unethical].

Scenario 6:

A commercial time-sharing service offered use of a program at a premium charge, the program to be used only in the service company's computer. A user obtained a copy of the program accidently, when the service company inadvertently revealed it to him in discussions through the system (terminal to terminal) concerning a possible program bug. All copies of the program outside of the computer system were marked as trade secret, proprietary to the service, but the copy the customer obtained from the computer was not. He used the copy of the program after he obtained it, without paying the usage fee to the service.

Degree to which the user's act of exploiting accidental access to a proprietary program is unethical.

Absolutely Not Unethical 1 2 3 4 5 6 7 **Absolutely Unethical**

[**S6:** Classification = PROTECTION OF PRIVACY; 24 out of 26 experts found the user's action to be unethical].

Scenario 7:

A university student used the campus computer time-sharing service as an authorized user. The service director announced that students would receive public recognition if they successfully compromised the computer system from their terminals. Students were urged to report the weaknesses they found. This created an atmosphere of casual game playing and one-upmanship in attacking the system.

The student found a means of compromising the system and reported it to the director. However, nothing was done to correct the vulnerability, and the student continued to use his

advantage to obtain more computer time than he was otherwise allowed. He used the time to play games and continue his attacks to find more vulnerabilities.

Degree to which the student's act of using idle computer time is unethical

Absolutely Not Unethical	1	2	3	4	5	6	7	**Absolutely Unethical**

[**S7:** Classification = PERSONAL CONDUCT; 20 out of 26 experts found the student's action to be unethical].