Computers, Ethics, And The Accountant

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Abstract

This paper reports an empirical study of perceptions by accounting professionals, accounting faculty, and accounting students regarding ethics issues related to computing. Over 600 responses to a survey questionnaire were analyzed to identify possible differences due to group (professional, faculty, student), gender, and computer usage, in addition to interaction effects. Group and gender were both significant main effects. Because this study used many (41) short questions, it suggests further research using fewer, longer scenarios in order to isolate specific aspects of situations that clarify or muddy what should be appropriate action. The findings of this study can also be useful for expanding accountants' awareness of ethical issues related to computer use.

Introduction

The purpose of this paper is to describe a study of ethical issues related to the use of computers among accounting professionals, faculty, and accounting students. Survey participants were asked to rate the ethics of 41 activities related to computer use and to express how common they believe those activities to be among their colleagues.

Concern for high ethical standards has been a hallmark of the accounting profession since its inception. The profession's *Code of Professional Ethics*, developed by the American Institute of Certified Public Accountants (AICPA), has served as an ethical standard for CPA's and as a model for other organizations developing their own codes of ethics and professional behavior.

Over time, various accounting organizations have formed to reflect and represent the growing number of specializations in the accounting field. For example, the EDP Auditors Association (EDPAA), the Institute of Internal Auditors (IIA), and the Institute of Management Accountants (IMA) have all developed codes of ethics and professional behavior for their membership. Despite these efforts however, none of these codes deals directly with the ethics of computer use. Thus many accountants may not be aware of the special ethical issues related to computer use and computing technology.

During the 1980's, computers and particularly microcomputers rapidly became the most important tools used by accounting professionals. Although there are over 500,000 members of the AICPA, IIA, and IMA, very few belong to professional groups that focus on computers and Systems. Moreover, the groups likely to enroll large numbers of computer users and managers, such as the Association for Computing Machinery (ACM) and Data Processing Management Association (DPMA), list relatively few account-

Readers with comments or questions are encouraged to contact the authors via email.

ants as members. Thus, codes of ethics from these computer systems organizations have had little impact upon accounting computer users.

Issues in Computer Ethics

The basic ethical decisions about computer use are often not fundamentally different than those posed by other business situations. However, Kaliman and Grillo (1993) point out that information technology may cloud the identification of ethical issues and may allow people to perform unethical acts previously impossible with manual methods or more quickly than ever before. For example, browsing others' computer files and/or making copies, making a copy of software, or testing system security by attempting to "break in" are all examples where the exact ethical violation may not be immediately obvious.

Legality and the ethicality are not always the same when the use of computers is involved. As Wagner (1991) points out, some actions are both legal and ethical and some acts are neither, as shown in Figure 1: cells I and IV.

Figure 1. Legal vs. Ethical

	Legal	Illegal
Ethical	I	II
Unethical	III	IV

Where difficult situations are likely to arise however is when the law and ethics do not agree (cells I and III). For example, is it ethical to make a backup copy of software even when the license agreement does not specifically allow it? Or, is using a pirated copy of software in a country without copyright laws ethical?

The Stanford Research Institute (Parker, 1982) developed a taxonomy of ethical issues related to computing technology and information Systems. Included in the taxonomy were six categories:

- Unauthorized use of computers or personal or non-business purposes.
- Disputed rights to property including the property rights to software and data and the unauthorized violation of intellectual property.
- Confidentiality of data to be held private and emphasizing that computer users are confronted with access to private data and the potential violations of trust with the subject of data.
- Conflicts in personal morality having to do with professional ethics and organizational loyalty, such as the duty to report a fraud using the computer.
- Responsibility of the social effects of computer applications, such as displacing workers through automation and violations of employee privacy.
- Responsibility for influencing public opinion, including the use of computers as tools for deception or intimidation schemes.

Codes of ethics from the various professional organizations have generally provided little specific, ethical guidance to computer users. While not excluding computers, the AICPA code does (as a general guide to behavior) mandate that a member should be ethical in all activities that would presumably include while using computers. However, how the use of technology related to overall ethical standards is not readily apparent in the code. Even the code of the ACM is not very specific on ethical issues. The *ACM Code of Conduct* uses words such as "integrity", "competence", "responsibility", and "knowledge" but only as these apply generally to work performance.

The Software Publishers Association probably provides the most specific information on ethics and computer use. This group, representing corporate suppliers of software and computer services, has produced several documents on the ethical and legal use of software. The purpose of these documents is to discourage the wrongful theft of intellectual property rights by the copying and transfer of software among users. Many

types of organizations have based internal software use policies on these documents. (ITAA, 1992)

Methodology of the Study

A questionnaire, based upon the ethical categories in the SRI taxonomy, was constructed and extensively pretested. The questionnaire consisted of 41 situations of computer use where ethical problems may be involved. The questions on the instrument dealt with such issues as the ownership rights over programs and data, privacy in computer use, access to Systems, non-business use of computers on company time, purchasing decisions related to hardware and software, and several personal ethical situations related to computer users. The respondents were asked to rate the 41 activities on a five-point scale shown in Figure 2.

Figure 2. First Survey Scale

		Possible Sanction
1	Always ethical	No sanctions
2	Usually Ethical	Discussion
3	Sometimes Ethical	Warning
4	Rarely Ethical	Serious reprimand
5	Never Ethical	Dismissal

In addition, the participants were asked to rate on another five point scale how common they believe the activity to be among their professional colleagues, as shown in Figure 3.

Figure 3. Second Survey Scale

A	Few Colleagues	0% to 5%
B	Minority	6% to 39%
C	Approximately half	40% to 60%
D	Majority	61% to 94%
E	Virtually All Colleagues	95% to 100%

A copy of the finished questionnaire is available from the authors.

One thousand questionnaires were sent to a sample of accounting practitioners who are members of several state CPA societies. Useable responses were received from 229, a 23% response rate. In addition, 600 questionnaires were mailed to accounting academics that have specialty areas of accounting systems, computers, or information Systems. Faculty returned 167 surveys yielding a 28% response rate. A third sample group consisted of 183 accounting students enrolled at several different universities.

Data analysis--research expectations

Data were analyzed along three keys: subject group (students, faculty, practitioners), gender, and hours of computer use (0-5 hours per week, 6-10 hours per week, 11-20 hours, 21-30 hours, and over 30). The research hypothesis is that there are no differences between the groups. There are no expectations with respect to directional alternative hypotheses. That is, we do not anticipate that students, for example, will view various activities as more ethical than faculty or practitioners. Also, as discussed above, this is primarily descriptive research. It is our hope to use the findings to generate formal hypotheses for additional research.

Significant differences between treatment groups would imply the need for further research and discussion in order to determine the specific areas of disagreement. Areas of high consensus should assist individuals in making decisions that would be respected by their peers.

Data Analysis--Summary Statistics

Tables 1 through 4 show the distribution of the 600+ subjects to the first mailing by group, gender, and computer usage.

Tables 5 through 7 show the individual means for each question for the three treatment groups and univariate F-Tests where significant ($\alpha < .100$).

Significance Tests

Table 8 shows the multivariate F-statistics and significance levels for the three main effects and the three interaction effects.

Table 1. Subject Distribution Group by Gender

	Students	CPAs	Faculty	Total	%
Male	105	190	162	457	71.4
Female	90	59	34	183	28.6
Total	195	249	196	640	100.0

Note: There were 8 missing and/or unusable responses.

Table 2. Subject Distribution Group by Computer Use

	Students	CPAs	Faculty	Total	%
0-5 Hours	83	33	11	127	19.7
6-l0 Hours	64	56	31	151	23.4
11-20 Hours	36	71	69	176	27.2
21-30 Hours	8	56	58	122	18.9
Over 30 Hours	3	38	29	70	10.8
Total	194	254	198	646	100.0

Note: There were 2 missing and/or unusable responses.

Table 3. Subject Distribution Gender by Use

	0 to 5 Hours	6-10 Hours	11-20 Hours	21-30 Hours	Over 30 Hours	Total	%
Male	89	97	129	89	52	456	86.9
Female	37	51	46	33	16	183	13.1
Total	126	148	175	122	68	639	100.0

Note: There were 9 missing and/or unusable responses.

Main Effects--Gender: As a main effect, gender was significant for both sets of questions (How ethical? and How common?). Interestingly, female subjects, *as* a group viewed the activities as more unethical and more common than their male counter-parts. That is, there were thirteen questions (see table 5) where significant effects between male and female subjects were measured for the issue of "How ethical?" For each of these questions, female subjects viewed the activity as more unethical. Similarly, there were nine questions where significant effects between male and female subjects were measured for the issue of "How common?" With one interesting exception (discussed below), female subjects viewed the activity as more common.

The exception to this pattern related to question 28 that concerned "Distributing copies of public domain software that displays nude figures on the screen." Female subjects said that this activity was significantly more unethical ($\alpha \leq .005$) which is consistent with the pattern of responses for "How ethical?" However, male subjects said that this activity occurred more often than female subjects. This is the only question (out of nine) where male subjects said that the activity occurred more often that female subjects.

Gender ceases to be significant for "How ethical?" when students are removed from the analysis. However, gender remains significant ($\alpha = .001$) for the "How common?" questions even when the student group is removed from the analysis.

Main Effect--Group: As a main effect, group was also statistically significant. There were twenty-one "How ethical" questions where sig-

Table 4a. Subject Distribution Group by Computer Use--Male Subjects Only

	Students	CPAs	Faculty	Total	%
0-5 Hours	52	29	8	89	19.5
6-10 Hours	29	45	23	97	21.3
11-20Hours	20	54	55	129	28.3
21-30 Hours	3	37	49	89	19.5
Over 30 Hours	0	25	27	52	11.4
Total	104	190	162	456	100.0

Table 4b. Subject Distribution Group by Computer Use--Female Subjects Only

	Students	CPAs	Faculty	Total	%
0-5 Hours	31	3	3	37	20.2
6-10 Hours	35	10	6	51	27.9
11-20 Hours	16	16	14	46	25.2
21-30 Hours	5	19	9	33	18.0
Over 30 Hours	3	11	2	16	8.7
Total	90	59	34	183	100.0

Note: There were 9 missing and/or unusable responses.

nificant differences between subject groups were reported. There was no noticeable pattern in the responses; seven times, students saw the behavior as more unethical, compared to four times for practitioners, and ten times for faculty.

For the question of "How common?" there were significant differences between the groups for thirty-nine of the forty-one individual questions. For these, student responses were always highest. That is, students perceived that the activities happened more than professionals and faculty. This suggests that a base-rate fallacy exists within the student group. Alternatively, it could reflect the difference between student and professional life. That is, students on a tight budget might be more likely to copy software, than a professional who can obtain site licenses relatively inexpensively.

Another interesting response is that there was no difference to the question of "How common is 'Relying on others' skills and time for solving computer problems instead of consulting documentation."' Perhaps this is a phenomenon that is universal across populations!

Even when students are removed, group is a significant effect for both "How ethical?" and "How common?"

Main Effects-- Use: Hours of computer use was the experimental operationalization for expertise. Thus, the research question was to find out whether expertise affected perspectives on ethics and/or pervasiveness of ethical problems.

Use was not a main effect. While there were two individual questions where significant effects were measured, because there are 41 observations, there is too strong of a likelihood that these 2 questions represent a possibility of Type I error.

There were 10 questions that showed significant differences in terms of "How common?" the behavior was. With one exception, there was no pattern in the responses (e.g., lower users always said that the activity was more pervasive) that would allow for any generalizations.

The exception occurred on question 32, which dealt with "Relying on others' skills and time for solving computer problems instead of

Table 5. Mean Responses by Group to Common Computer Ethics Situations

Question		How Ethical? 1=Always Ethical; 5 = Never Ethical				How Prevalent? 1=Few Colleagues; 5=Virtually All			
		Students *n=183*	*CPAs* *n=229*	*Faculty* *n=167*	*α-Level*	*Students* *n=181*	*CPAs* *n=219*	*Faculty* *n=159*	*α-Level*
1	Playing computer games at work.	3.574	3.537	3.018	0.001	2.359	2.056	2.289	
2	Using your work computer to learn software that may never be used on the job.	2.913	2.817	2.365	0.001	2.602	2.181	2.459	0.002
3	Using your employer's computer to maintain mailing lists for a charitable organization.	3.033	2.721	2.814		2.116	2.009	1.956	
4	Writing personal letter using the computer.	3.202	3.004	2.832		3.442	3.153	3.365	0.018
5	Doing computer assignments for a night course you are taking at a local university. (The company is not paying the tuition.)	3.383	2.865	2.557	0.001	2.718	2.296	2.465	0.003
6	Doing computer assignments for a night course you are taking at a local university. (The company is paying the tuition.)	2.519	2.092	1.994		3.182	2.639	2.566	0.004
7	Making a copy of your employer's software to do work on a home computer.	2.738	3.393	3.533	0.029	3.652	2.801	3.000	0.000
8	Making a copy of your employer's software for personal use at home.	3.852	4.170	4.407	0.012	3.376	2.500	2.654	0.000
9	Making a copy of software for use on a portable computer while traveling on business.	1.956	2.472	2.407	0.049	3.950	3.009	3.057	0.000
10	Keeping and using a personal copy of software developed by you, under assignment with your former employer.	2.087	2.672	2.461	0.000	3.470	2.454	2.409	0.000
11	Making a copy of company software to give to a friend.	4.235	4.585	4.623	0.004	2.840	1.889	1.956	0.000
12	Marketing software developed by you as a by-product of work done for your employer.	3.317	3.948	3.419	0.000	2.337	1.537	1.679	0.000
13	Using a company computerized customer list to solicit funds for a political candidate you support.	4.399	4.624	4.701		1.928	1.324	1.428	0.000

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Table 5 (continued)

14	Using another person's network ID and password with their express permission.	2.475	2.847	2.695		3.387	2.481	2.252	0.000
15	Using another person's network ID and password left out in the open for anyone to see.	4.383	4.266	4.545	0.059	2.166	1.690	1.560	0.002
16	Reading E-mail messages intended for others sent by your subordinates.	4.202	3.987	4.240	0.024	2.762	1.898	1.799	0.000
17	Scanning a subordinate's computer for non-company files and programs.	3.628	2.937	3.329	0.000	2.497	1.880	1.730	0.000
18	Gaining access to a system you are not authorized for, by using trial and error methods to bypass system security (hacking).	4.694	4.712	4.868	0.040	2.099	1.389	1.396	0.000
19	Blaming mistakes and delays in the computer system when the true cause is human error.	3.814	3.908	3.970		3.492	2.708	2.761	0.000
20	Changing data in a corporate database through hacking activity.	4.765	4.900	4.946		1.845	1.204	1.245	0.000
21	Gaining access to a competitor's computer through hacking activity.	4.760	4.891	4.904		1.956	1.204	1.233	0.000
22	As an external auditor, attempting to test the accessibility of a client system using a hacking activity without the client's knowledge.	3.978	3.908	3.431		2.022	1.426	1.415	0.002
23	As an external auditor, gathering audit evidence on transactions using a hacking activity.	4.137	3.996	3.503	0.033	2.044	1.449	1.396	0.001
24	Using a computerized mailing list belonging to your employer to set up your own business.	4.514	4.878	4.850		2.072	1.375	1.283	0.000
25	Intentional submission of incorrect data to slow processing time.	4.317	4.707	4.820	0.004	1.994	1.204	1.201	0.000
26	Introduction of a virus program into the system that displays a humorous message on the screen of network users.	4.017	4.559	4.587	0.072	1.989	1.306	1.333	0.000
27	Introduction of a virus program into the system that may cause the loss of data for some network users.	4.803	4.974	4.982		1.464	1.130	1.088	0.003
28	Distributing copies of public domain software that displays nude figure on the screen.	4.087	4.201	3.820	0.007	1.641	1.287	1.314	0.004

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Table 5. (continued)

Question		How Ethical? 1=Always Ethical; 5 = Never Ethical				How Prevalent? 1=Few Colleagues; 5=Virtually All			
		Students n=183	*CPAs* n=229	*Faculty* n=167	*α-Level*	*Students* n=181	*CPAs* n=219	*Faculty* n=159	*α-Level*
29	Using a borrowed copy of commercial software on your company computer on a trial basis until you decide whether to buy your own copy.	3.060	3.266	3.090		2.932	2.218	2.239	0.000
30	Inflating computer skills when applying for a new job or promotion.	3.869	4.009	4.251		3.470	2.537	2.352	0.000
31	Recommending software or hardware for purchase after receiving free samples from the vendor.	2.164	2.555	2.311		3.409	2.412	2.440	0.000
32	Relying on other's skills and time for solving computer problems instead of consulting documentation.	2.727	2.109	2.006	0.002	3.564	3.542	3.591	
33	Monitoring clerical employee productivity by measuring computer activity but without disclosure to the employees being monitored.	3.317	3.092	3.449	0.096	2.939	2.148	1.950	0.000
34	Monitoring clerical employee productivity by measuring computer activity but with disclosure to the employees being monitored.	1.923	1.821	1.701		3.392	2.481	2.252	0.000
35	Using a computerized phone dialing system to place marketing calls to prospective customers.	2.044	2.354	2.551		3.613	2.245	2.491	0.000
36	Using a computer to send advertising faxes to prospective customers.	2.186	2.585	2.635		3.503	2.042	2.289	0.000
37	Failing to recycle used computer paper.	3.175	2.537	2.539	0.004	3.442	2.912	3.189	0.046
38	Posting E-mail messages for non-work issues you feel very strongly about but others may find politically controversial.	3.656	3.703	3.533		2.536	1.685	1.906	0.000
39	Using company time to learn new software that may or may not be used in the job.	3.596	3.472	3.626		2.691	2.204	2.132	0.002
40	Using E-mail to spread gossip and rumors.	4.470	4.485	4.569		2.238	1.667	1.717	0.001
41	Recommending software or hardware for purchase after receiving a commission or referral fee from a vendor.	3.497	3.092	3.952	0.010	2.691	1.708	1.686	0.000

Table 6. Mean Responses by Gender to Common Computer Ethics Situations

Question		How Ethical? 1=Always Ethical; 5 = Never Ethical			How Prevalent? 1=Few Colleagues; 5=Virtually All		
		Male *n=412*	*Female* *n=163*	*α-Level*	*Male* *n=396*	*Female* *n=160*	*α-Level*
1	Playing computer games at work.	3.323	3.577	0.027	2.215	2.212	
2	Using your work computer to learn software that may never be used on the job.	2.609	2.982	0.004	2.384	2.400	
3	Using your employer's computer to maintain mailing lists for a charitable organization.	2.760	3.049	0.032	1.960	2.194	0.030
4	Writing personal letter using the computer.	2.913	3.270	0.013	3.293	3.312	
5	Doing computer assignments for a night course you are taking at a local university. (The company is not paying the tuition.)	2.818	3.233	0.023	2.432	2.606	
6	Doing computer assignments for a night course you are taking at a local university. (The company is paying the tuition.)	2.104	2.429	0.008	2.694	3.025	
7	Making a copy of your employer's software to do work on a home computer.	3.279	3.074		3.063	3.294	
8	Making a copy of your employer's software for personal use at home.	4.138	4.129		2.783	2.912	0.049
9	Making a copy of software for use on a portable computer while traveling on business.	2.303	2.215		3.227	3.581	
10	Keeping and using a personal copy of software developed by you, under assignment with your former employer.	2.415	2.439		2.624	3.094	
11	Making a copy of company software to give to a friend.	4.448	4.472		2.167	2.331	
12	Marketing software developed by you as a by-product of work done for your employer.	3.602	3.571		1.74	2.050	0.075
13	Using a company computerized customer list to solicit funds for a political candidate you support.	4.580	4.558		1.457	1.769	0.027
14	Using another person's network ID and password with their express permission.	2.660	2.736		2.583	3.307	

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Table 6. (continued)

Question		How Ethical? 1=Always Ethical; 5 = Never Ethical			How Prevalent? 1=Few Colleagues; 5=Virtually All		
		Male n=412	*Female n=163*	*α-Level*	*Male n=396*	*Female n=160*	*α-Level*
15	Using another person's network ID and password left out in the open for anyone to see.	4.376	4.393		1.755	1.931	
16	Reading E-mail messages intended for others sent by your subordinates.	4.087	4.227		2.018	2.475	0.065
17	Scanning a subordinate's computer for non-company files and programs.	3.240	3.368		1.965	2.212	
18	Gaining access to a system you are not authorized for, by using trial and error methods to bypass system security (hacking).	4.760	4.730		1.545	1.806	
19	Blaming mistakes and delays in the computer system when the true cause is human error.	3.905	3.865		2.838	3.337	0.076
20	Changing data in a corporate database through hacking activity.	4.879	4.853		1.346	1.619	
21	Gaining access to a competitor's computer through hacking activity.	4.854	4.853		1.359	1.681	0.082
22	As an external auditor, attempting to test the accessibility of a client system using a hacking activity without the client's knowledge.	3.677	4.086	0.002	1.558	1.787	
23	As an external auditor, gathering audit evidence on transactions using a hacking activity.	3.738	4.294	0.000	1.568	1.767	
24	Using a computerized mailing list belonging to your employer to set up your own business.	4.757	4.742		1.485	1.812	
25	Intentional submission of incorrect data to slow processing time.	4.672	4.466		1.364	1.694	
26	Introduction of a virus program into the system that displays a humorous message on the screen of network users.	4.481	4.258		1.432	1.787	0.055
27	Introduction of a virus program into the system that may cause the loss of data for some network users.	4.947	4.859		1.174	1.350	

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Table 6. (continued)

28	Distributing copies of public domain software that displays nude figure on the screen.	3.934	4.368	0.005	1.437	1.344	0.008
29	Using a borrowed copy of commercial software on your company computer on a trial basis until you decide whether to buy your own copy.	3.112	3.239		2.386	2.600	
30	Inflating computer skills when applying for a new job or promotion.	4.063	3.963		2.667	3.094	
31	Recommending software or hardware for purchase after receiving free samples from the vendor.	2.359	2.387		2.649	2.975	
32	Relying on other's skills and time for solving computer problems instead of consulting documentation.	2.204	2.466		3.518	3.681	
33	Monitoring clerical employee productivity by measuring computer activity but without disclosure to the employees being monitored.	3.189	3.472	0.020	2.237	2.612	
34	Monitoring clerical employee productivity by measuring computer activity but with disclosure to the employees being monitored.	1.760	1.963	0.086	2.598	2.987	
35	Using a computerized phone dialing system to place marketing calls to prospective customers.	2.308	2.313		2.654	3.037	
36	Using a computer to send advertising faxes to prospective customers.	2.490	2.423		2.475	2.881	
37	Failing to recycle used computer paper.	2.636	3.000		3.109	3.300	
38	Posting E-mail messages for non-work issues you feel very strongly about but others may find politically controversial.	3.558	3.828	0.025	1.955	2.175	
39	Using company time to learn new software that may or may not be used in the job.	3.488	3.712	0.056	2.258	2.531	
40	Using E-mail to spread gossip and rumors.	4.473	4.583		1.780	2.062	
41	Recommending software or hardware for purchase after receiving a commission or referral fee from a vendor.	3.852	3.902		1.921	2.264	

Table 7. Mean Responses by Computer Usage to Common Computer Ethics Situations

Question		How Ethical? 1=Always Ethical; 5 = Never Ethical — Computer Usage-Hours per week						How Prevalent? 1=Few Colleagues; 5=Virtually All — Computer Usage-Hours per week					
		0 to 5 n= 120	*6 to 10* n= 133	*11 to 20* n= 158	*21 to 30* n= 104	*Over 30* n= 63	α-Level	*0 to 5* n= 120	*6 to 10* n= 133	*11 to 20* n= 158	*21 to 30* n= 104	*Over 30* n= 63	α-Level
1	Playing computer games at work.	3.608	3.376	3.386	3.327	3.190		2.153	2.279	2.215	2.181	2.263	
2	Using your work computer to learn software that may never be used on the job.	2.792	2.797	2.722	2.673	2.460		2.466	2.357	2.470	2.229	2.404	
3	Using your employer's computer to maintain mailing lists for a charitable organization.	2.942	2.835	2.778	2.971	2.667		2.034	2.116	2.054	1.857	2.053	
4	Writing personal letter using the computer.	3.167	3.120	3.006	2.942	2.667		3.178	3.171	3.389	3.400	3.474	0.053
5	Doing computer assignments for a night course you are taking at a local university. (The company is not paying the tuition.)	3.233	3.075	2.785	2.817	2.667		2.517	2.473	2.443	2.467	2.561	
6	Doing computer assignments for a night course you are taking at a local university. (The company is paying the tuition.)	2.475	2.218	2.215	2.048	1.841	0.066	2.898	2.915	2.671	2.695	2.807	

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Table 7. (continued)

7	Making a copy of your employer's software to do work on a home computer.	3.000	3.000	3.297	3.442	3.603		3.093	3.302	3.094	2.971	3.175	0.031
8	Making a copy of your employer's software for personal use at home.	3.925	4.030	4.215	4.228	4.137		2.805	3.031	2.705	2.686	2.912	0.006
9	Making a copy of software for use on a portable computer while traveling on business.	2.258	2.090	2.241	2.500	2.571		3.373	3.550	3.309	3.105	3.140	
10	Keeping and using a personal copy of software developed by you, under assignment with your former employer.	2.458	2.316	2.513	2.490	2.302		2.966	2.946	2.685	2.590	2.474	
11	Making a copy of company software to give to a friend.	4.242	4.496	4.614	4.615	4.381	0.006	2.297	2.326	2.168	2.038	2.228	
12	Marketing software developed by you as a by-product of work done for your employer.	3.650	3.609	3.570	3.635	3.460		2.008	1.907	1.718	1.638	2.000	0.091
13	Using a company computerized customer list to solicit funds for a political candidate you support.	4.483	4.556	4.582	4.635	4.667		1.644	1.556	1.530	1.429	1.596	0.020
14	Using another person's network ID and password with their express permission.	2.773	2.662	2.703	2.644	2.683		2.907	2.822	2.658	2.495	2.596	
15	Using another person's network ID and password left out in the open for anyone to see.	4.375	4.361	4.418	4.375	4.365		1.898	1.822	1.839	1.590	1.877	

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Table 7. (continued)

Question		How Ethical? 1=Always Ethical; 5 = Never Ethical — Computer Usage-Hours per week: 0 to 5 (n=120)	6 to 10 (n=133)	11 to 20 (n=158)	21 to 30 (n=104)	Over 30 (n=63)	α-Level	How Prevalent? 1=Few Colleagues; 5=Virtually All — Computer Usage-Hours per week: 0 to 5 (n=120)	6 to 10 (n=133)	11 to 20 (n=158)	21 to 30 (n=104)	Over 30 (n=63)	α-Level
16	Reading E-mail messages intended for others sent by your subordinates.	4.175	4.083	4.146	4.096	4.127		2.305	2.202	2.141	1.905	2.158	
17	Scanning a subordinate's computer for non-company files and programs.	3.517	3.226	3.184	3.221	3.143		2.229	2.047	1.966	1.886	2.088	
18	Gaining access to a system you are not authorized for, by using trial and error methods to bypass system security (hacking).	4.700	4.782	4.791	4.760	4.667		1.737	1.643	1.584	1.467	1.702	
19	Blaming mistakes and delays in the computer system when the true cause is human error.	3.875	3.970	3.905	3.837	3.841		2.941	3.008	2.899	2.962	3.246	0.031
20	Changing data in a corporate database through hacking activity.	4.808	4.880	4.899	4.875	4.889		1.559	1.426	1.403	1.324	1.368	
21	Gaining access to a competitor's computer through hacking activity.	4.817	4.857	4.905	4.798	4.873		1.661	1.519	1.383	1.229	1.456	

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Table 7. (continued)

22	As an external auditor, attempting to test the accessibility of a client system using a hacking activity without the client's knowledge.	4.067	3.805	3.690	3.692	3.651		1.788	1.674	1.544	1.495	1.614	
23	As an external auditor, gathering audit evidence on transactions using a hacking activity.	4.092	3.902	3.937	3.769	3.619		1.856	1.651	1.470	1.467	1.789	
24	Using a computerized mailing list belonging to your employer to set up your own business.	4.675	4.647	4.823	4.846	4.810		1.788	1.574	1.523	1.371	1.667	0.100
25	Intentional submission of incorrect data to slow processing time.	4.517	4.534	4.652	4.750	4.667		1.619	1.550	1.409	1.257	1.421	
26	Introduction of a virus program into the system that displays a humorous message on the screen of network users.	4.267	4.263	4.525	4.519	4.540		1.644	1.628	1.477	1.352	1.579	
27	Introduction of a virus program into the system that may cause the loss of data for some network users.	4.850	4.917	4.930	4.971	4.968		1.331	1.209	1.215	1.113	1.246	
28	Distributing copies of public domain software that displays nude figure on the screen.	4.050	4.068	4.165	4.038	3.778		1.415	1.465	1.376	1.314	1.544	

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Table 7. (continued)

Question	How Ethical? 1=Always Ethical; 5 = Never Ethical — Computer Usage-Hours per week: 0 to 5 n= 120	6 to 10 n= 133	11 to 20 n= 158	21 to 30 n= 104	Over 30 n= 63	α-Level	How Prevalent? 1=Few Colleagues; 5=Virtually All — Computer Usage-Hours per week: 0 to 5 n= 120	6 to 10 n= 133	11 to 20 n= 158	21 to 30 n= 104	Over 30 n= 63	α-Level
29 Using a borrowed copy of commercial software on your company computer on a trial basis until you decide whether to buy your own copy.	3.158	3.165	3.089	3.183	3.190		2.636	2.841	2.369	2.305	2.491	
30 Inflating computer skills when applying for a new job or promotion.	3.950	4.030	4.152	4.000	3.968		3.059	2.884	2.698	2.505	2.789	
31 Recommending software or hardware for purchase after receiving free samples from the vendor.	2.367	2.278	2.449	2.356	2.333		3.042	2.899	2.638	2.524	2.491	
32 Relying on other's skills and time for solving computer problems instead of consulting documentation.	2.525	2.353	2.152	2.087	2.254		3.458	3.465	3.698	3.495	3.825	0.020
33 Monitoring clerical employee productivity by measuring computer activity but without disclosure to the employees being monitored.	3.208	3.271	3.259	3.279	3.333		2.627	2.465	2.195	2.114	2.351	

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Table 7. (continued)

34	Monitoring clerical employee productivity by measuring computer activity but with disclosure to the employees being monitored.	1.975	1.797	1.759	1.712	1.857	3.068	2.829	2.510	2.543	2.561	
35	Using a computerized phone dialing system to place marketing calls to prospective customers.	2.100	2.083	2.456	2.433	2.635	3.127	3.016	2.530	2.467	2.579	
36	Using a computer to send advertising faxes to prospective customers.	2.283	2.188	2.608	2.692	2.730	2.941	2.891	2.409	2.238	2.298	
37	Failing to recycle used computer paper.	2.925	2.797	2.646	2.596	2.714	3.161	3.171	3.181	3.057	3.298	
38	Posting E-mail messages for non-work issues you feel very strongly about but others may find politically controversial.	3.717	3.662	3.671	3.577	3.476	2.246	2.054	1.946	1.829	2.018	
39	Using company time to learn new software that may or may not be used in the job.	3.658	3.586	3.576	3.510	3.349	2.424	2.217	2.356	2.257	2.491	0.011
40	Using E-mail to spread gossip and rumors.	4.508	4.541	4.532	4.529	4.317	1.873	1.860	1.919	1.752	1.930	0.064
41	Recommending software or hardware for purchase after receiving a commission or referral fee from a vendor.	3.692	3.812	3.905	4.077	3.841	2.220	2.203	2.027	1.663	1.842	

Table 8. Significance Tests of Main and Interaction Effects

	How Ethical?		How Pervasive?	
	F Statistic	α	*F Statistic*	α
Main Effects				
Use	0.8276	0.942	1.0000	0.487
Gender	1.5175	0.023	1.3969	0.056
Group	2.8726	0.000	2.8473	0.000
Interaction Effects				
Gender By Use	0.8344	0.934	1.0291	0.389
Group By Use	0.8780	0.939	0.8843	0.928
Group By Gender	0.9678	0.561	1.6064	0.001

consulting documentation." Here, the responses by heavy computer users (≥ 30 hours per week) were the highest, while the responses by light users (≤ 5 hours) were the lowest. This suggests that light users are bothering heavy users more than they believe, or that heavy users are complaining for no good reason!

Interaction Effects: While there were three treatment groups, it was not meaningful to run a 3-way analysis of variance. The three treatments (3 groups, 2 genders, and 5 use categories) would result in 30 different cells. The sample size was such that one cells was empty and several others (especially for female subjects) had five or fewer observations (refer to tables 4a and 4b).

At the two-way level, the problem with small cell sizes is reduced, except for "Group by Computer Use" which still has two small cells (in the student group) that have fewer than 10 observations. The implication of small cells is that it is harder to measure significant effects and even more difficult to draw meaningful conclusions.

For the questions asking "How ethical?" the given activity was there were no statistically significant two-way interaction effects. However, for the questions asking "How pervasive?" the given activity was, there was a significant Group-Gender effect (α = .001). While one possible explanation for this is that there were a disproportionate number of female student subjects (90 out of 195), as compared to professionals (59 out of 249) and faculty (34 out of 196), the effect remains (α = .001) when students are removed from the sample.

Other discussion: The present research was designed to obtain a broad spectrum of information relative to a variety of ethics issues. A follow-up design, especially in areas where there is low consensus will be to design a smaller set of longer case scenarios in order to isolate other circumstances and issues that would cause agreement or disagreement between subject groups.

For example, the responses to questions 33 and 34 indicate that the presence of a company policy causes markedly different attitudes on the ethics of a particular activity. Similarly, the responses to questions 14 and 15 reinforce the idea that prior knowledge and/or permission increase the ethics of the activity. This suggests that additional research could be structured to examine few cases where elements surrounding one issue (e.g., using someone's network I.D.) are modified (e.g., the person knows vs. the person does not know). This supports the general thesis of this research: that properly informed individuals can make better; i.e., more widely acceptable/ethical decisions.

Suggestions for Future Research

The questionnaires used in this research focused on very short, concise examples of computer use, which might pose ethical dilemmas to users. Further research in this area might seek users responses to longer more, complex scenarios which would better approximate real situations. In fact, the ethical dimension of real situations often is not simply right or wrong but rather composed of a variety of factors, which may interact during the decision process of the user. Further, the impact of the Internet and e-commerce is more pervasive each year making the ethical dimensions of computer use increasingly widespread as more users go online. Any new surveys of computer ethics must take into account the impact of the connected nature of the online world. Finally, what should be the explicit role (if any) of computer ethics in professional codes of ethics for accountants? An in-depth analysis of formal codes of ethics and accepted ethics statements for computer use should be undertaken.

Conclusions

The findings of this study should be useful for expanding accountants' awareness of the ethical problems related to computer use. Further, this study could provide a framework to assist in the assessment of ethical situations and help users in making more responsible ethical decisions. Also, the results of the surveys should highlight situations where the ethical perceptions about computer use by practitioners, educators, and students may differ. Finally, the findings of this study may form the basis for the development of a professional code of ethics for accountants regarding computer use.

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