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Social Judgments and Technological Innovation: Adolescents' Understanding of Property, Privacy, and Electronic Information

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Abstract — *Two complementary studies were conducted to understand the diverse views adolescents hold regarding electronic information. One study examined concepts of property pertaining to copying computer programs. The second study examined concepts of privacy pertaining to accessing computer files. Preselection tasks were used with several hundred adolescents to assure a diversity of moral and nonmoral views toward electronic information. From this group, 64 adolescents (mean age, 17 years 2 months), 32 in each study, were selected for in-depth interviews, lasting approximately 2 hr. Results showed that adolescents who permitted copying computer programs ("computer pirating") and accessing computer files ("computer hacking") still held overall to property and privacy rights in general and applied those rights in prototypic situations (e.g., not stealing a bicycle and not reading another person's diary without permission). Several aspects of the technology contributed to adolescents' difficulty in identifying harmful or unjust consequences of computer-mediated*

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actions. These aspects included the ways technology can easily reproduce software, distance the actor from potential victims, and allow for access without direct harm. The results also suggest that in response to a technological innovation whose conventional status is in flux, adolescents appear to draw on foundational moral considerations to a larger extent than commonly recognized. Broadly understood, the research informs on the general phenomenon of cultural adaptation to technological innovation. © 1997 Elsevier Science Ltd

Electronic information constitutes a technological innovation that may be challenging people's conceptions of property and privacy. Notice, for example, that while many people, even in business, routinely copy software they have purchased, software companies maintain that such actions violate their intellectual property rights. Legal opinion on this matter is not well established, and varies dramatically across situations. Or consider an event that received national media attention. A group of high school students, called the 414s, accessed without authorization numerous computer systems, including those at Los Alamos National Research Center, a bank in Los Angeles, and a hospital in New York. When apprehended by the FBI, the students claimed they were unaware they had done anything unethical or that would cause harm. Others, however, have said that the 414s signaled the erosion of adolescents' moral respect for privacy in general.

How are we to understand such seemingly diverse views that people hold about electronic information technologies? This research addressed this question by examining adolescents' understandings of electronic information in relation to concepts of property and privacy. Roughly, property concerns the self's control over tangible and intangible goods, while privacy concerns the self's control over what is known about oneself. Both concepts are central to social and moral life. Thus, supporting the largest goal of this research, both concepts provide a valuable means by which to examine how cultures adapt to technological innovation.

Two complementary studies were conducted under a single framework. One study examined adolescents' concepts of property pertaining to three situations which involved copying computer programs: copying for personal use, copying to give to another, and copying for financial gain. The second study examined adolescents' concepts of privacy pertaining to three situations which involved accessing computer files: accessing another's computer file but without reading the file's contents, accessing another's file and reading the contents, and accessing another's file and changing information in the file. Some of these situations involved what will be referred to as potentially ambiguous situations, meaning that the situation to a greater or lesser degree encompasses unsettled social conventions (e.g.,

copying for personal use). As points of contrast, both studies also investigated noncomputer situations, including those which were prototypically immoral (e.g., stealing a bicycle) and potentially ambiguous (e.g., taping a record album to give to someone else).

Taken together, the studies focused on three overarching issues. The first issue concerned electronic information and the instantiation of the rights to property and privacy. Part of what is at stake here stems from the cross-cultural literature. Concepts of property and privacy appear to exist in every human society (Herskovits, 1952; Lowie, 1925; Roberts & Gregor, 1971; Westin, 1967/1984). It also appears that most individuals understand and recognize a prototypic violation of the right in the context of their own culture and, though less well documented for privacy, most individuals extend their conceptions of prototypic violations to people in other cultures (Harris & Westin, 1979; Nisan, 1987; Nucci & Turiel, 1993; Nucci, Turiel, & Encarnacion-Gawrych, 1983; Shweder, Mahapatra, & Miller, 1987; Song, Smetana, & Kim, 1987; Turiel, 1983). However, alongside these largely universalistic aspects of property and privacy stand those that are relativistic: Namely, among and within cultures widespread variation exists about to whom or to what and how the concept and corresponding right is applied (Becker, 1977; Biggs, 1970; Mead, 1949; Murphy, 1964). Thus, the current research assessed adolescents' conceptions of property and privacy rights in general, and their application. It was expected that even if adolescents held a nonmoral orientation to potentially ambiguous situations, including those that involve electronic information, they would none the less show evidence of a moral orientation toward property and privacy in general and in their prototypic instantiations.

The second issue focused on how adolescents account for unsettled conventions in their judgments about electronic information. In the social cognitive literature, a substantial amount of research has examined social reasoning about well-established social conventions (Arsenio & Ford, 1985; Kahn & Turiel, 1988; Killen, 1990; Laupa, 1991; Nucci, 1981, 1985; Smetana, 1981b; Turiel, 1983). Yet the role of unsettled social conventions in individuals' social judgments is not well understood (Smetana, 1995; Tisak, 1995), particularly when this situation arises by virtue of a technological innovation. For example, based on the US Copyright Law, it is clearly illegal to copy commercial software and then sell it for profit. Yet it is not at all clear based on the law's fair-use clause whether it is legal to copy a piece of commercial software one has purchased in order to use the copy on another computer in one's home, or at one's office (Samuelson, 1993). People routinely copy for such purposes, while supposedly accepting a licensing agreement, upon opening most software packages, that vendors (but not necessarily the courts) say outlaws such action. Thus, the current research

sought to assess how, in such situations, adolescents coordinate personal, conventional, legal, and moral considerations.

The third issue focused on how computers as a mediating technology affect adolescents' social judgments. This issue has been examined indirectly by other research. For example, Milgram's (1974) studies on obedience to authority and Fleming's (1984) study on adolescents' views toward genetic engineering and nuclear power provide compelling evidence that individuals' social judgments and actions can be influenced by their proximity to any resulting harm. The more remote the individual from the resulting harm, the more likely the individual to cause or permit harm to occur. More to the point, in both studies technology frequently helped to distance the actor from resulting consequences. In the current research, a similar effect was expected insofar as computer technology tends to distance actors from the consequences of their actions. Thus, it was expected that adolescents would be less aware of the harmful and unjust consequences from computer-mediated actions than from noncomputer actions.

Finally, it is important to note that the intent of both studies was to understand the diversity and range of views toward electronic information. Accordingly, the research did not seek to tap a representative sample of adolescents in the population at large, but a representative sample of adolescents who held moral and nonmoral views toward electronic information. Following literature in moral philosophy (Gewirth, 1978; Rawls, 1971) and moral psychology (Kohlberg, 1984; Turiel, 1983, in press), moral reasoning was defined as judgments which are not contingent on the dictates of authority or social rules, but prescriptive, generalizable, and based on considerations of other's welfare, justice, and/or rights. To achieve the diversity of reasoning on this moral dimension, preselection tasks were used with several hundred adolescents. From this group, a smaller subset was selected for in-depth interviews.

METHODS

Subjects and Preselection

This research was conducted in a high school located in a middle-income neighborhood in the San Francisco Bay Area. Students attending the high school were of mixed ethnic and social backgrounds as assessed by students' racial status and the level of education attained by their parents. The school provided a broad, well-integrated computer education program. Each semester, approximately 30% of the students at the school used computers

in business, computer science, and journalism courses, an extracurricular science program, and during lunch-time computer use.

To achieve an in-depth analysis across a diversity of viewpoints, an initial objective was to interview those adolescents who viewed computer property and privacy issues in predominantly moral terms or predominantly nonmoral terms. To preselect subjects on this basis, 212 students (Grades 11 and 12) completed a survey containing a paper-and-pencil checklist modeled after a task by Nucci (1981). The checklist used the criterion of rule contingency — whether or not the rightness or wrongness of an act is independent of social rules — as an initial measure of moral judgment. Specifically, the checklist assessed whether three computer property acts (copying a program for your own use, copying a program to give away, and copying a program to sell) and three computer privacy acts (accessing without permission but not reading another person's computer file, accessing without permission and reading another person's computer file, accessing without permission and changing information in another person's computer file) were thought of as rule contingent (e.g., Is the act wrong? Would the act still be wrong in the absence of a rule prohibiting the action?).

Based on subjects' responses to the checklist, a classification was identified for each of the computer topics (property and privacy). Subjects who listed all three computer property acts as wrong independent of rules were classified "property moral", subjects who listed two of the computer property acts as wrong independent of the rules were classified "property intermediate moral", and subjects who listed one or none of the computer property acts as wrong independent of the rules were classified "property nonmoral". A parallel procedure was used to classify the students on the basis of their evaluations of the computer privacy acts, yielding the classifications "privacy moral", "privacy intermediate moral", and "privacy nonmoral". Thus, each subject was assigned both a property and a privacy classification.

A total of 64 students (mean age, 17 years 2 months; range, 15 years 8 months to 18 years 6 months; *SD*, 7 months) of the 212 surveyed were selected to be interviewed about their social judgments concerning property or privacy acts in computer settings. Sixteen subjects, about equal numbers of males and females, were randomly chosen from each of the four outermost classification groups: property-moral (8 male, 8 female); property-nonmoral (10 male, 6 female); privacy-moral (8 male, 8 female); and privacy-nonmoral (10 male, 6 female). The preselection task was used only to insure that subjects held, as a group, a diversity of views on the computer issues. The more substantive data derived from the semi-structured interview (described later) were used for analysis.

Procedures and Measures

The social judgment interview consisted of a semi-structured interview (Damon, 1977; Helwig, 1995; Kahn, 1992; Kahn & Friedman, 1995; Killen & Hart, 1995; Nucci, 1996; Piaget, 1929/1960; Smetana, 1981a; Turiel, 1983; Turiel, Hildebrandt, & Wainryb, 1991; Wainryb, 1995) lasting approximately 2 hr. This interview format assured that subjects responded to the same set of issues, but also allowed for variation in follow-up questions in order to pursue those issues that seemed to be of importance to the subject. The interviews were tape-recorded and then transcribed for analysis. Transcripts averaged over 30 single-spaced pages per subject.

The interview focused on either property or privacy issues as determined by the subject's preselection group. Subjects in the property groups were interviewed on property topics, comprised of:

1. Computer property ([a] copying commercial software the actor had purchased for his/her own use, [b] copying commercial software the actor had purchased to give to someone else, and [c] copying commercial software the actor had purchased to sell to someone else).
2. Prototypic property (taking without permission another person's bicycle).
3. Potentially ambiguous noncomputer intellectual property (taping a record album the actor had purchased to give the tape to someone else).

Subjects in the privacy groups were interviewed on privacy issues, comprised of:

1. Computer privacy ([a] accessing without permission another person's computer file but not reading the file's contents, [b] accessing without permission and reading another person's computer file, and [c] accessing without permission and changing information in another person's computer file).
2. Prototypic privacy (reading without permission another person's diary).
3. Potentially ambiguous noncomputer privacy (reading without permission a letter lying open on another person's desk).

In all cases, the computer topic was administered first so as not to predispose the subject to draw inferences from the other more familiar topics. The remaining topics were counter-balanced by preselection group and sex.

A summary of the assessments and sample interview questions are presented in Table 1. To assess subjects' conceptions of electronic information and other noncomputer items as either private property or private information, subjects were asked to place several items on a either a Property or Privacy Scale, depending on their group. For the Property Scale,

Table 1. Summary of Assessments and Interview Questions

Assessment	Interview question (sample stimulus: "copying commercial software the actor had purchased to give to someone else")
Scale	"Here is a property scale. One end is labeled "public property", the other end is labeled "private property". Here is a mark on the scale labeled "backyard". Place a new mark on this scale that shows how you think about a published (commercial) computer program in terms of being public or private property."
Act evaluation	"Would it be all right or not all right for someone to copy a computer program he had bought and give the copy away?"
Consequences overall	"What effects do you think copying a commercial program to give to someone else might have?"
Consequences for author's or owner's feelings	"How do you think the author/owner would feel if the program he had written and published was copied by someone else?"
Knowledge of US Copyright Law	"Does the Copyright Law apply to computer programs? If so, how?"
Generalizability of practice	"Imagine a country where it is common practice for people to copy computer programs they have purchased and give the copies away. Is that all right or not all right?"
Inalienability of instantiations of the right	"Would it be all right or not all right if a culture treated all computer programs as public property?"
Inalienability of the right in general	"Would it be all right or not all right if a culture treated all objects as public property?"

subjects were asked to place the following items relative to a benchmark labeled "backyard": a street corner litter box, a bicycle, and a published (commercial) computer program. For the Privacy Scale, subjects were asked to place the following items relative to a benchmark labeled "report card": a school bulletin board, a diary, and your own computer file. To assess subjects' social judgments of the acts in the USA in the context of current societal practices, subjects were asked to evaluate whether individuals should refrain from the act. Then, to gain further specificity on subjects' awareness of the consequences of the acts, subjects were asked to state the effects of the act overall and the specific effects on the author's or owner's feelings. In addition, to assess understanding of current US law as it applies to computer programs, subjects in the property groups were asked to explain how the Copyright Law applies to commercial software. Finally, subjects' understandings of property or privacy rights were assessed in three ways. The first way (generalizability of practice) assessed whether or not subjects generalized their judgments about a practice to people in a culture who commonly engaged in such practices. The second way (inalienability of instantiations of the right) assessed whether or not subjects judged a particular instantiation of the right as inalienable. The third way (inalienability of the right in general)

assessed whether or not subjects' judged the right in general as inalienable. For all these questions, subjects were asked to provide justifications for their responses. Multiple justifications were encouraged when appropriate. When subjects provided potentially contradictory responses at different times in the course of the interview, they were asked to reconcile their seemingly different viewpoints.

Coding and Reliability

A coding manual for the interview data was generated from half of the interviews, a total of 32 interviews, 8 from each preselection group. The coding manual was then used to code the remaining half of the data, and the codings from both halves of the data were combined for analysis. Three types of data were coded: evaluations, content responses, and justifications. Evaluations pertained to the rightness or wrongness of acts (e.g., all right/not all right). Content responses pertained to knowledge of US Copyright Law and to the consequences of the acts (e.g., unequivocal harm/no harm). Justifications entailed subjects' reasons for their evaluations. When appropriate, justification categories were adapted from Davidson, Turiel, and Black (1983) and Turiel et al. (1991). Summary descriptions for the most general level of the justifications coding system are presented in Table 2.

To assess reliability of the coding system, 12 interviews (19%) — 3 randomly chosen from each of the preselection groups — were recoded by an independent scorer trained in the use of the coding manual. A total of 165 evaluations, 148 content responses, and 263 justifications were recoded. Reliability results are reported for the justification categories as described in Table 2. The reliability results by question type are: evaluations, 96%; content responses, 83%; and justifications, 76%.

Statistical Analysis

Nonparametric statistics were used. Responses coded dichotomously (e.g., private/not private) with no division within the independent variable were analyzed based on the two-tailed binomial distribution. Fisher's exact test, two-tailed, was used to analyze dichotomous responses with two divisions within the independent variable (e.g., male and female) and chi-square was used for larger matrices. McNemar's statistic for repeated measures was used to determine if subjects changed in particular evaluations across conditions. Each comparison was tested at the .05 level.

Four types of data were tested for gender differences: subjects' degree of computer experience, evaluations, content responses, and justifications. In both studies, virtually no gender differences were found, fewer than one

Table 2. Summary of Justification Categories and Illustrative Responses

Category	Description (sample responses in parentheses)
Actor's welfare	Reference to the actor's physical, psychological, material, or emotional welfare in the context of a social relationship ("I don't feel bad when I read someone else's computer file, like I would if I read their diary").
Other's welfare	Reference to an effect on others' physical, psychological, material, or emotional welfare ("It's hurting someone" or "The person might need the information later on ... you erase it, then he wants that later on for some use").
Other's welfare not affected	Reference to not affecting others' welfare ("There's no harm") or to an insignificant effect on others ("It's [copying software] not going to affect a company in a significant way — just a little effect").
Assumed risk	Reference to the cost or risk to the actor by virtue of engaging in a social practice, however, the cost or risk is acceptable because it is expected, known, or elected by the individual by virtue of the individual choosing to participate in the practice ("People realize ... they're gonna tape it and they'll lose money; they have the decision to say 'No we don't want to make any more records,'").
Fairness and rights	Reference to fairness and rights, potentially in the context of claims based on merit ("If it's something that you create, ... you should be able to determine whether you want to make it public or not") or ownership ("If it belongs to you, you can do anything you want with it").
Social contract	Reference to requiring the agreement of all members of society ("It's all right because everyone agreed") or not allowing a social practice when even one person does not agree ("It can't be a rule if everyone doesn't agree").
Ideal society	Reference to an ideal society that reflects goodness or meaning or values ("If they become community property, then anybody could take it, and things would no longer have any value to you, and ... it kind of becomes a world without anything of value; and there'd be no way to express value or whatever").
Social convention	Reference to customs, traditions, and common practices ("It's the way it's done") or to social functions and social organization ("So people will know what to expect from each other; it makes the society work").
Authority	Reference to authority, typically in terms of law ("It's OK because there is no law against it").
Individual issue	Reference to the self outside of social relations ("If someone can get into a computer I don't see why it would be wrong") or individual concerns ("It's his decision").
Unelaborated	Reference to the act or some of its features ("I'm not sure why it's good but it is"). Coded only when no other category is appropriate.

would expect by chance at the .05 level. Thus, the results for males and females were combined for analysis.

RESULTS FROM STUDY 1: PROPERTY AND ELECTRONIC INFORMATION

Understandings About Property

Property Scale. All of the students (100%) placed a street corner litter box in the not private property area of the Property Scale ($p < .001$) and virtually all

of the students (97%) placed a bicycle in the private area ($p < .001$). In contrast, the published computer program was not placed exclusively in either area of the scale (75% in the not private property area and 25% in the private property area). Of those students who permitted copying of software to give (described later), virtually all (93%) did not conceive of a published computer program as private property on the Property Scale ($p < .01$).

Evaluations. All of the students (100%) judged taking a bicycle as not all right. In contrast, 23% of the students judged as not all right copying a program for their own use ($\chi^2_M = 22.04, p < .001$), 53% copying a program to give ($\chi^2_M = 12.07, p < .005$), 60% copying a program to sell ($\chi^2_M = 10.08, p < .005$), and 38% taping an album to give ($\chi^2_M = 16.06, p < .001$). In terms of copying a program for their own use, students judged this act as not all right less often than copying a program to give ($\chi^2_M = 7.11, p < .01$) and copying a program to sell ($\chi^2_M = 9.09, p < .005$). In addition, of the students who judged making a single copy for the consumer to give or sell as all right, 50% judged making unlimited copies to give or sell as not all right. With respect to commonality among the acts, 97% of the students gave the same evaluation for copying a program to give and copying a program to sell, 89% for copying a program to give and taping an album to give, and 85% for copying a program to sell and taping an album to give.

Justifications. Table 3 presents the percentage of justifications students provided for permitting and prohibiting the property acts. For those students who prohibited the acts (averaging percents across acts), 44% of the justifications students provided were based on fairness or rights claims (fairness and rights category), 29% based on welfare considerations (other's welfare), and 23% based on legal violations (authority). It is also worth noting that 64% of the authority justifications were used in conjunction with other's welfare or fairness and rights justifications. For those students who permitted the acts (averaging percents across acts), 35% of the justifications included welfare considerations (16% other's welfare not affected, 10% other's welfare, 9% actor's welfare) and 36% fairness and rights claims (fairness and rights). Students who permitted the acts deviated in their justification use from those who prohibited the acts in two ways. First, students who permitted the acts made little use of authority justifications. Second, students who permitted taping an album to give made use of the social convention category for 34% of their justifications. This category was not used substantively by students for justifying any other evaluation. Also of note, an appeal to punishment and punishment avoidance comprised a formal coding category that was not used by students and, thus, was subsequently dropped from the analysis.

Table 3. Percentage of Justifications by Property Act and Evaluation

Justification	Act evaluation												Generalizability						Inalienability of the right in general		
	All right						Not all right						All right						Not all right		
	PO	PG	PS	AG	(Avg.)	AG	PO	PG	PS	BT	AG	(Avg.)	PG	AG	(Avg.)	PG	BT	AG	(Avg.)	All right	Not all right
Actor's welfare	14	5	6	9	(9)	0	8	0	4	7	(4)	0	0	5	(2)	0	0	0	(0)	0	0
Other's welfare	0	18	12	9	(10)	29	27	14	33	40	(29)	5	0	0	(2)	29	39	40	(36)	0	11
Other's welfare not affected	11	23	18	12	(16)	0	0	0	0	0	(0)	10	13	9	(10)	0	0	0	(0)	0	0
Assumed risk	0	5	6	0	(3)	0	0	0	2	0	(0)	10	13	5	(9)	0	0	0	(0)	20	0
Fairness and rights	64	23	41	16	(36)	29	42	67	48	33	(44)	19	6	14	(13)	57	39	60	(52)	0	74
Social contract	0	0	0	0	(0)	0	0	0	0	0	(0)	0	0	0	(0)	0	0	0	(0)	40	0
Ideal society	0	0	0	0	(0)	0	0	0	0	0	(0)	0	0	0	(0)	0	0	0	(0)	10	4
Social convention	0	5	6	34	(11)	0	0	0	2	0	(0)	5	50	14	(23)	0	0	0	(0)	10	11
Authority	4	5	0	12	(5)	43	23	19	12	20	(23)	24	19	14	(19)	0	0	0	(0)	0	0
Individual issue	4	18	6	3	(8)	0	0	0	0	0	(0)	19	0	32	(17)	0	0	0	(0)	0	0
Unelaborated	4	0	6	3	(3)	0	0	0	0	0	(0)	10	0	9	(6)	14	22	0	(12)	20	0
Totals	101	102	101	98	(101)	101	100	100	100	101	(100)	102	101	102	(101)	100	100	100	(100)	100	100

Note. Justifications are not reported for evaluations given by 10% or less of the students. Some subjects gave multiple justifications. All justifications were coded for each subject. Percents (column totals) may not equal 100 due to rounding. PO = copy program for own use; PG = copy program to give; PS = copy program to sell; BT = take bicycle; AG = tape album to give; Avg. = average.

Consequences. To provide a stringent measure of students' understanding of the harmful consequences from the acts, students' responses to questions about the effects of the property acts overall and on the author's or owner's feelings were coded into one of two categories: (a) acts that unequivocally harmed others or (b) acts that caused no harm or provided a reasonable balance between benefits and harm to others. Virtually all of the students (94%) judged taking a bicycle as unequivocally harmful to others. In contrast, 59% of the students judged copying a program to give as unequivocally harmful to others ($\chi^2_M = 5.79, p < .02$) and 54% taping an album to give ($\chi^2_M = 10.08, p < .005$). A similar pattern of results was found for students' responses to direct questioning about the effect of the acts on the author's or owner's feelings. All of the students (100%) judged taking a bicycle as unequivocally harming the owner's feelings, while 73% of the students judged copying a program to give as unequivocally harming the author's feelings ($\chi^2_M = 5.14, p < .025$) and 45% taping an album to give as unequivocally harming the musician's feelings ($\chi^2_M = 14.06, p < .001$).

Impact of Previous Knowledge

Computer Knowledge. Students' evaluations of the computer property acts were examined in relation to their computer experience: computer games only, computer literate but without programming experience, 1 year of programming experience, and more than 1 year of programming experience. No significant differences were found.

Legal Knowledge. Students' evaluations of the computer property acts were examined in relation to their knowledge of US Copyright Law. Virtually all students (96%) had a reasonable understanding of the Copyright Law. Fifty-six percent characterized the Copyright Law as prohibiting all copying of programs, 15% as prohibiting copying programs to sell, 19% as protecting the author's economic rights and authorship, and 7% as restricting other cases of copying and using programs. Despite such understandings, 57% of the students who permitted copying a computer program for their own use did so in opposition to their legal knowledge, 58% for copying a program to give, and 70% for copying a program to sell.

Property as a Right

About two thirds of the students (63%) generalized their judgments not to take a bicycle to people in a culture who commonly engaged in such practices. In contrast, only 31% of the students generalized their judgments

not to copy a program to give ($\chi^2_M = 3.27, p < .10$, marginally significant) and 19% not to tape an album to give ($\chi^2_M = 8.64, p < .005$).

In terms of the inalienability of property rights in general, 67% of the students judged a culture that treated all objects as public property as not all right. As shown in Table 3, 74% of students' justifications for this evaluation were based on the category of fairness and rights. In contrast, the 33% of the students who judged a culture that treated all objects as public property as all right provided different justifications. Of these students' justifications, 40% were based on the requirement that each participant agree to the social practice (social contract) and 20% on reference to risks that an individual voluntarily assumes by electing to participate in the social practice (assumed risk). Of the students (67%) who judged a property right in general as inalienable, a significant percentage judged specific instantiations of the right as alienable. Namely, 72% of the students judged as all right a culture that treated all bicycles as public property ($\chi^2_M = 11.08, p < .001$), 54% for computer programs ($\chi^2_M = 4.17, p < .05$), and 49% for songs on record albums ($\chi^2_M = 3.13, p < .10$, marginally significant).

DISCUSSION OF STUDY 1: PROPERTY AND ELECTRONIC INFORMATION

All of the students (100%) prohibited taking a bicycle. This finding is in agreement with a wide range of other research where prototypic property violations have been negatively evaluated (Arsenio & Ford, 1985; Hollos, Leis, & Turiel, 1986; Nucci & Turiel, 1993; Shweder et al., 1987; Smetana, 1981a; Song et al., 1987; Tisak & Ford, 1986). In contrast to a bicycle, and as expected given the preselection measure, fewer students prohibited copying a commercial program to give to another (53%) and copying a program to sell (60%). These latter findings raise the question of why copying commercial programs — in many cases popularly called computer pirating — was so often accepted by students who otherwise were assessed as normal on prototypic property violations.

One possible explanation is that people who copy do so because they believe they will not be caught. Although this form of reasoning has appeared in numerous other studies which have investigated the development of individuals' moral reasoning (Kohlberg, 1984) and was a formal coding category in this study, it was not used by students. Another possible explanation is that people who frequently use computers are motivated by self-interest to copy, given their wide range of computer needs and interests, and that they often work or study in a computer environment that condones copying (Freedman, 1985; Taylor, 1986). However, in this study, no relation

was found between the amount or type of students' computer experience and their evaluations for copying. A third possible explanation is that students who copy are simply ignorant of the US Copyright Law (Friday, 1985; Slesnick, 1984). However, this explanation was not supported as it was found that 96% of the students possessed a reasonable understanding of the Copyright Law as it applies to computer programs.

Rather, the results suggest that an explanation for why students often permitted copying lies in students' complex and multifaceted understanding of computer programs as property. To start with, while 97% of the students viewed a bicycle as strictly private property, only 25% of the students viewed commercial computer programs as such. In addition, most of the students (93%) who allowed copying to give attributed some public status to commercial programs which suggests an inverse relation wherein the more an object is conceived of as public, the less likely a property violation pertaining to the object can occur.

Various forms of justice justifications played a central role in students' reasoning. Sometimes evaluations pivoted on differing assessments of the status of individual rights when a consumer purchases software. For instance, some students highlighted consumer's rights ("The guy [consumer] paid the initial cost ... paid for the right to use it [the disk] ... you can use it anyway you want"). Other students highlighted author's rights ("The author of it [the computer program] has the right to make, to gain, whatever financial gain he wants to make off of it"). Evaluations also pivoted on differing assessments of what constitutes a fair situation. For instance, some students viewed it as fair that an author profit from his work ("[When someone copies] the author's not getting what he deserves for the work that he did"), while other students viewed copying as fair since it compensates for unfair high prices ("I still believe one of the [reasons for the high price of software] is to cover loss due to piracy ... However, I believe their putting the cost of piracy on the software is wrong because it's asking people to pay for something that they never did get. It's like asking someone to pay, to suffer for a crime they never did commit").

It was also found that students were less aware of or less frequently legitimized harmful consequences from copying a program to give than taking a bicycle. For instance, the overall effects of the acts showed that copying (59%) was viewed as unequivocally harmful by fewer students than taking a bicycle (94%). Similarly, when questions focused on the explicit feelings of the author or owner, fewer students viewed as unequivocally harmful copying (73%) than taking a bicycle (100%). Justification results provide further clarity. Some students, for example, believed that copying is essentially a harmless activity ("I can't really think how [copying to give to others] would really hurt someone"). Other students believed that insignif-

icant harm results from copying, given the scale of profits in the computer industry (“[Copying and selling software] doesn’t matter very much, because the author and the manufacturer are making a lot of money anyway, and I don’t think that ... selling it to one or two friends is gonna make that much of a difference”). Still other students believed that substantial harm would result if many people performed that act, but negligible harm if performed by only a few people (“[Copying for] 50 people, that’s going to hurt the company or the company’s sales. Giving it to one person isn’t hurting anybody, it’s one copy of the program”).

Taking the above evaluation and justification data together, while students more often permitted copying computer programs than stealing a bicycle, in both situations they were sensitive to moral considerations pertaining to welfare, rights, and fairness. What was different in the computer situation was that students did not believe that moral violations had occurred. This finding counters some current beliefs that adolescents, for computer-related issues, are devoid of an ethical sensibility.

Perhaps what distinguishes conceptions of computer programs from bicycles has less to do with computer technology as a technology per se, but with computer programs as an instantiation of intellectual property. After all, like computer programs, other types of intellectual property can be copied and thus “stolen” without actually taking a tangible object away from the owner. The study addressed this proposition by investigating students’ conceptions of taping a record album, and the proposition was found to have some merit. For instance, students provided roughly equal (statistically not different) responses in evaluating the cases of copying a program to give and taping a record to give. Students also had comparable (statistically not different) difficulties recognizing or legitimizing harmful consequences to others in both cases.

However, there was one notable difference between the two cases. Copying a record to give resulted in a substantial use of social conventional justifications that emphasized common practice (“people have been doing it [taping records] for so long”; “everyone does it”; “it’s common practice”). In contrast, copying computer programs resulted in virtually no use of social conventional justifications. This finding was particularly surprising given that such copying commonly occurs in society. Moreover, it was documented in this particular school that students and teachers frequently copied computer programs in a variety of contexts (Friedman, 1990). It may be that when better established conventional practices govern the instantiation of a particular piece of intellectual property, conventions play a substantial role in adolescents’ social reasoning. Conversely, when conventional practices are in flux, as with copying computer programs, conventions play a minimal role.

Some of the results show that the students conceived of property in what some might call relativist terms. The majority of students, for example, said that if commonly practiced in another country it would be all right to copy computer programs (69%) or tape records (81%). Indeed, in such a social context, 37% of the students said it would even be all right to take a bicycle. Furthermore, many students judged the instantiation of property rights to bicycles (72%), computer programs (54%), and songs on record albums (49%) to depend on conventional practices. Other results, however, cast a different light. Two thirds of the students (67%) judged a property right in general as inalienable. Moreover, of the students who considered the right to be alienable (33%), 40% relied on the qualification that each and every person in the culture agree to the cultural practice. Accepting that such agreement — in effect, a social contract — reflects a moral orientation, approximately 80% of the students brought a moral orientation to bear in their evaluation of a property right in general. In sum, it appears that while a property right in general was often conceived of as an inalienable right, particular instantiations of the right could be informed by conventional practices.

RESULTS FROM STUDY 2: PRIVACY AND ELECTRONIC INFORMATION

Understandings About Privacy

Privacy Scale. All of the students (100%) placed a notice on a school bulletin board in the not private area of the Privacy Scale ($p < .001$) and virtually all of the students (97%) placed a diary in the private area ($p < .001$). In contrast, students did not place the computer file exclusively in either area of the scale (34% in the not private area and 66% in the private area). Of the students who placed the computer file in the private area of the scale, the majority (90%) prohibited accessing and reading another person's computer file ($p < .001$) (described later).

Evaluations. Students judged accessing a computer file without reading the contents as not all right less often than the other acts. They also perceived commonalty among the remaining four computer and noncomputer acts: accessing and reading a computer file, accessing and changing information in a computer file, reading a diary, and reading a letter that is lying open on someone's desk. Specifically, 57% of the students judged accessing a computer file without reading the contents as not all right, while, in contrast, 84% of the students judged as not all right accessing and reading a computer file ($\chi^2_M = 4.17, p < .05$), 100% accessing and changing information in a

computer file ($\chi^2_M=8.10$, $p < .005$), 97% reading a diary ($\chi^2_M=9.09$, $p < .005$), and 90% reading a letter that is lying open on someone's desk ($\chi^2_M=8.10$, $p < .005$).

Justifications. Table 4 presents the percentage of justifications students provided for permitting and prohibiting the privacy acts. By and large, students used four types of justifications for permitting the acts (averaging percents across acts): 43% of the justifications were based on the perception that others were not affected by the act (other's welfare not affected), 27% on welfare considerations for the actor (actor's welfare), 13% on personal choice (individual issue), and 11% on fairness or rights claims (fairness and rights). All of the fairness and rights justifications supported judgments to permit accessing a computer file without reading the information, while all of the individual issue justifications supported judgments to permit accessing and reading another's computer file. Students who prohibited the acts provided a somewhat different pattern of justification use (averaging percents across acts): 52% of students' justifications were based on concerns of fairness and rights (fairness and rights) and 26% on the effect of the act on others (other's welfare). Regardless of the evaluation, only 6% of the corresponding justifications drew on social conventional reasoning (e.g., social convention or authority categories). Rather 86% of students' justifications were comprised of moral justifications: 40% of justice considerations (fairness and rights) and 46% of welfare considerations (19% other's welfare, 12% actor's welfare, and 15% other's welfare not affected).

Consequences. As noted in the results on property, two measures were used to assess students' understanding of the harmful consequences of the acts — namely, students' assessments of the effects of the privacy acts overall and on the author's or owner's feelings. Virtually all of the students (91%) said reading a diary was unequivocally harmful to others, 68% for reading a computer file, and 78% for reading a letter on someone's desk. In pairwise comparisons between items, there were no significant differences. However, significant differences were found in students' responses to direct questioning about the effect of the acts on the author's or owner's feelings. All of the students (100%) judged reading a diary as unequivocally harming the owner's feelings, compared with 75% of the students who judged reading a computer file as unequivocally harming the owner's feelings ($\chi^2_M=6.12$, $p < .02$) and 81% reading a letter on someone's desk ($\chi^2_M=4.17$, $p < .05$).

Impact of Previous Computer Knowledge

Students' evaluations of the computer privacy acts were examined in relation to their computer experience: computer games only, computer literate but

Table 4. Percentage of Justifications by Privacy Act and Evaluation

Justification	Act evaluation												Generalizability						Inalienability of the right in general					
	All right						Not all right						All right						Not all right					
	FA	FR	(Avg.)	FA	FR	(Avg.)	FA	FR	FC	DR	LR	(Avg.)	FR	DR	LR	(Avg.)	FR	DR	LR	(Avg.)	All right	Not all right		
Actor's welfare	29	0	(27)	5	6		4	10	3	(6)	0	0	0	0	0	(0)	0	0	0	0	0	0	0	0
Other's welfare	0	0	(0)	14	19		56	15	28	(26)	0	0	0	0	0	(0)	13	0	11	(8)	17	0	29	0
Other's welfare not affected	36	50	(43)	14	3		0	0	0	(3)	17	21	0	0	(13)	0	0	0	0	(0)	0	0	0	0
Assumed risk	0	0	(0)	5	0		0	0	0	(1)	0	0	0	8	(3)	0	0	0	0	(0)	0	0	0	0
Fairness and rights	21	0	(11)	43	61		37	59	62	(52)	13	0	0	0	(4)	88	100	89	(93)	0	0	0	42	0
Social contract	0	0	(0)	0	0		0	0	0	(0)	13	0	0	0	(4)	0	0	0	0	(0)	17	0	4	0
Ideal society	0	0	(0)	0	0		0	0	0	(0)	0	0	0	0	(0)	0	0	0	0	(0)	0	0	4	0
Social convention	0	0	(0)	0	10		4	13	7	(7)	39	64	83	(62)	0	0	0	0	0	(0)	67	0	8	0
Authority	0	0	(0)	10	0		0	0	0	(2)	17	7	0	(8)	0	0	0	0	0	(0)	0	0	0	0
Individual issue	0	25	(13)	0	0		0	0	0	(0)	0	0	0	0	(0)	0	0	0	0	(0)	0	0	8	0
Unelaborated	14	0	(7)	10	0		0	3	0	(3)	0	7	8	(5)	0	0	0	0	0	(0)	0	0	4	0
Totals	100	100	(101)	101	99		101	100	100	(100)	99	99	99	(99)	101	101	100	100	(101)	101	101	101	99	99

Note. Justifications are not reported for evaluations given by 10% or less of the students. Some subjects gave multiple justifications. All justifications were coded for each subject. Percents (column totals) may not equal 100 due to rounding. FA = access computer file only; FR = access and read computer file; FC = access and change computer file; DR = read diary; LR = read letter lying open on a desk; Avg. = average.

without programming experience, 1 year of programming experience, and more than 1 year of programming experience. As with the property results, no significant differences were found.

Privacy as a Right

Roughly half of the students (53%) generalized their judgments not to read a diary to people in a culture who commonly engage in such practices. Similarly, 36% generalized their judgments not to access and read another's computer file, and 46% not to read a letter lying open on someone's desk. In pairwise comparisons between acts, no significant differences were found.

In terms of the inalienability of a privacy right in general, a large majority of students (81%) judged a culture that treated all written material as public information as not all right. As shown in Table 4, 42% of students' justifications were based on fairness and rights and 29% on other's welfare. In contrast, those students (19%) who judged a culture that treated all written material as public information as all right provided largely a different set of justifications. Of these students' justifications, 67% were based on the organization of the society (social convention), 17% on the requirement that each participant agree to the social practice (social contract) and 17% on welfare considerations (other's welfare). Of the students (81%) who judged a privacy right in general as inalienable, a significant percentage judged specific instantiations of the right as alienable. Namely, 69% of the students judged as all right a culture that treated all computer files as public information ($\chi^2_M = 13.07, p < .001$), and 59% for all written materials on desks ($\chi^2_M = 10.08, p < .005$).

DISCUSSION OF STUDY 2: PRIVACY AND ELECTRONIC INFORMATION

The results provide some support for the proposition that students have largely assimilated important aspects of electronic information to their existing conceptions of private information. Most students judged as wrong accessing and reading a computer file without permission (84%), and accessing and changing information in a computer file without permission (100%). Similarly, most students judged as wrong reading another's diary (97%) and reading a letter lying open on someone's desk (90%). It was also the case that most students (68%) viewed the overall consequences of accessing and reading a computer file without permission to entail unequivocal harm, as did students for reading without permission a letter (78%) and a diary (91%).

There were several results, however, where students' conceptions of electronic information were not congruent with their conceptions of privacy. One result was that fewer students (57%) prohibited accessing a computer file without reading the information than the other computer and noncomputer privacy acts reported. One explanation for this finding can be found in students' justifications. Some students highlighted the absence of harm ("[Accessing a file without reading it] is just an exercise in defiance ... All you're doing is faking them out and you're not hurting them") or psychological benefit to the actor ("[There is] the thrill of getting there [into the computer file]"). Other students focused on an aspect of justice, highlighting the absence of a privacy violation since no information is obtained ("I ... don't think you're invading their privacy because you haven't actually read it [the computer file], you've just proven to yourself that you could read it if you wanted to"). Thus, in general, students considered accessing a computer file without reading the contents from the vantage points of welfare and justice. It is just that some students perceived neither harmful consequences nor injustice, and thus determined the act to be morally neutral. It has been documented elsewhere (Bloombecker, 1985; Parker, 1984; Yee, 1985) that adolescents often engage in this activity — popularly called computer hacking or, more recently, cracking. These results help provide an understanding of why.

It may be more difficult for adolescents to identify rights violations that occur through computer-mediated actions when they do not perceive corresponding harm. Recall the adolescent, for example, who justified accessing computer files without reading the file's contents: "[Accessing a file without reading it] is just an exercise in defiance ... you're not hurting them." Over a third of the students' justifications (36%) to support access without reading were along these lines. If correct, this proposition would be consistent with other research that suggests that individuals' conceptions of justice draw on, if not build from, welfare concerns (Davidson et al., 1983; Kahn, 1992; Walker, 1989).

Most students (81%) said it would not be all right if a culture treated all written information as public information. It was also the case, however, in situations where the common practice of another country permitted it, that roughly half of the students would then permit accessing and reading a computer file (62%), reading a letter (54%), and reading a diary (47%). Many students also judged the instantiation of a privacy right to computer files (69%) and reading written material on desks (59%) as culturally dependent. Thus, it appears that a right to privacy — similar to a right to property — is often conceived of as inalienable although particular instantiations of the right can be shaped by conventional practices.

CONCLUSION

Adolescents who use computers often copy commercial software and access others' computer files without authorization. How should we understand such actions? Is it the case, as some have suggested, that such actions signal the erosion of adolescents' moral views toward property and privacy in general? Or, at a minimum, do adolescents who condone these activities view electronic information as disconnected from their familiar moral positions? The results from both studies support neither proposition. Instead, the results showed that adolescents who permitted computer software copying and computer hacking generally upheld the right to property and privacy (and applied those rights in prototypic situations) but believed that such actions entailed neither unjust nor harmful consequences to others. These results, in turn, can be understood in terms of adolescents' social judgments in response to aspects of the technology itself, and how the technology acts as an innovation on the cultural level.

In terms of the technology, the results document four aspects of computer technology which made it difficult for the students to identify harmful or unjust consequences of computer-mediated actions. One aspect involved reproducibility. Unlike tangible property, such as a bicycle, students often reasoned that computer programs can be copied without depriving the original owners of their property or the original authors of their authorship. The second aspect involved proximity. Since computer technology can increase the physical distance between a perpetrator and a victim, the saliency of the resulting harm or injustice sometimes appeared diminished. The third aspect involved the decoupling of access from the moral domain. In a burglary, for example, breaking and entering refers to a single event which culminates in the theft of property. In a case of espionage, one can break and enter in order to gain access to confidential files. However, students often reasoned that when computer hacking entails accessing another's computer files without actually reading the files or in any way harming the integrity of the information, there is accordingly no harm, no victim, and, thus, no moral violation. The fourth aspect involved invisibility. Even in cases where a hacker reads a stranger's confidential computer files, students sometimes reasoned that since the technology allows the act to be done such that the stranger never becomes aware of the act, that again, there is no harm, no victim, and, thus, no moral violation.

Given these features of the technology, it would appear that to establish an immoral basis for computer copying and hacking one sometimes needs to decontextualize harm from its immediate and physical locations, and to have a generalized, principled understanding of rights which applies regardless of a

victim's awareness. The latter position is often developed by rights-based moral philosophers. Gewirth (1978), for example, argues that slavery violates a slave's rights even if the slave agrees to be enslaved. Thus, in future work it would be interesting to conduct another study along similar lines with adults (and children). At stake is whether the development of increased cognitive and moral structures allows people to construct increasingly adequate means for reconciling sophisticated features of technology within a moral orientation.

Even given these features inherent in the technology, and the plausibility of a developmental basis for individuals' social and moral knowledge vis-à-vis the technology, there is yet another overarching basis for interpreting the results and setting into motion future lines of inquiry. Namely, what happens to adolescents' social judgments when a technology poses a culture with innovation? Following this question, the most striking finding in the current study centered on copying computer programs for personal use and accessing files without reading the contents. Both activities — especially copying programs — are common in society, and copying programs routinely occurred at the students' school, by students and teachers alike. Yet results showed a virtual absence of social conventional reasoning about both acts. In contrast, adolescents often used social conventional reasoning for a comparable technology that involved more established conventional practices (taping a record album to give to someone else). Thus, in response to a technological innovation whose conventional status is in flux, adolescents appear to draw on foundational moral considerations to a larger extent than commonly recognized.

In turn, we can expect technological innovation to reshape some of our traditional practices and beliefs. At least historically and cross-culturally it has been so. Missionaries, for example, introduced a large number of steel ax heads to the Yir Yoront of Australia around 1915. They did so without regard for traditional restrictions on ownership, indiscriminately distributing the ax heads to men and women, old people and young adults alike. In so doing, they altered relationships of dependence among family members and reshaped conceptions of property within the culture (Sharp, 1952/1980). The introduction of the snowmobile to the Arctic Eskimo altered not only patterns of transportation but symbols of social status and increased dependence on a money economy (Pelto, 1973). The modernization of the traditional Peruvian Saraguro home to include electricity, heaters, and other household technologies that can be hazards to toddlers severely constrained traditional child-rearing practices that emphasized nonrestraint and autonomy of the children (Belote & Belote, 1984). Accordingly, it seems plausible that computer technologies will not only challenge our conceptions of

property and privacy — as this current study documents — but reshape them as well.

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