Unauthorized Copying of Software - An Empirical Study of Reasons For and Against

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Abstract

Computer users copy computer software - this is well-known. However, less well-known are the reasons why some computer users choose to make unauthorized copies of computer software. Furthermore, the relationship linking the theory and the practice is unknown, i.e., how the attitudes of ordinary end-users correspond with the theoretical views of computer ethics scholars. In order to fill this gap in the literature, we investigated the moral attitudes of 249 Finnish computing students towards the unauthorized copying of computer software, and we then asked how these results compared with the theoretical reasons offered by computer ethics scholars. The results shed a new light on students' moral attitudes with respect to the unauthorized copying of software. In particular, this new knowledge is useful for computer ethics teachers, and for organizations seeking to combat this practice.

Keywords: Computer Ethics; software piracy; intellectual property; software copyright; student ethical attitudes

1 Introduction

The question of whether or when it might be permissible to disregard copyright and make unauthorized copied of software has been debated among scholars (Johnson, 2000; Kallman & Grillo, 1993; Mason, 1986; Moor, 1985; Weckert, 1997; Weckert & Adeney, 1997; Siponen, 2001)., It is widely reported that members of the general public engage in the occasional unauthorized copying of software (Gattiker & Kelley, 1999; Gopal & Sanders, 1998; Quirchmayr, 1997; Traphagan & Griffith, 1998; Vitell & Davis, 1990). In turn, software companies regard this practice as an economic threat with the result that several strategies and institutions, such as Business Software Alliance and Software Publishers Association, have been established, to protect the economic interests of software companies (Bowyer, 2001; Forester & Morrison, 1993). Scholars and practitioners have also proposed several alternative ways of tackling the problem. These range from formation of alliances between foreign and domestic software companies, ethical codes of conducts for computer professionals (Anderson *et al*. 1993), reducing the price of software (Cheng and Png, 1999; Stallman, 1995; 1997; Strikweda & Ross, 1992), seeking to persuade users by the argument that the price of software would increase if copying were to continue (Lass & Wood, 1996), the introduction of legislation as a deterrent (e.g., BSA, SPA; Gopal & Sanders, 1998; Gopal *et al*., 1997; Seale *et al*., 1998) and psychological persuasion (Lin *et al*., 1999) to a variety of technical protection mechanisms (Malhotra, 1994). Also, several software piracy models, based on combinations of the aforementioned measures, have been constructed (e.g., Limayem *et al*., 1999; Lin *et al*., 1993; Moores & Dhillon, 2000).

Studies exploring the underlying reasons why people regard the unauthorized copying of computer software as morally unacceptable or acceptable are few (Cheng *et al*., 1997; Lending and Slaughter, 1999; Thong & Yap, 1998). The aforementioned software piracy models (e.g., Limayem *et al*., 1999), developed on the basis of the behavioural literature (such as Fishbein & Ajzen, 1975; Ajzen, 1991), do not reveal individuals' underlying moral reasons (Loch & Conger, 1996; Randall, 1989; Thong & Yap, 1998). The same is true for quantitative questionnaires, such as (Simpson *et al*., 1994).

Only two studies, by Cheng *et al*. (1997) and Seale *et al*. (1998) explore user rationales concerning the unauthorized copying of software, and neither was conducted in Europe. Moreover, given the long history of theories and the theoretical debate about software rights (e.g., see Johnson, 2000; Kuflik, 1995; Ladd, 1997; Siponen, 2001; Thong & Yap, 1998; Weckert, 1997; Weckert & Adeney, 1997), it is notable that as yet there has been no work (excluding Thong & Yap, 1998) exploring the relationship between the views in the literature on the ethical theory and how people really behave in practice. Such studies of ordinary users' moral attitudes are important for computer ethics education (Sumner & Werner, 1997) and for the development of methods to tackle the problem. As far as computer ethics education is concerned, it is crucial to perceive the match or non-match between theory and practice. To address the gap in the existing research, we analyzed the survey responses of 249 computing students' concerning their moral attitudes towards the unauthorized copying of computer software, and we explored how these answers compared with the attitudes suggested by computer ethics scholars.

In the second section of this paper, related studies and their respective theoretical foundations are discussed. In the third section, the research approach and research subjects are described. In the fourth section, the results of the study are presented. The fifth section, the discussion, considers the limitations as well as implications of the study. Finally, the conclusion summarizes the key findings of the study.

2 Theoretical reasons for disregarding copyright

The reasons for unauthorized copying of software can be found in the literature as listed below in Table 1.

Table 1. Reasons why copying of computer software is morally acceptable.

Reason	Relevant source/s
Software is intangible and/or non-exclusive	Kuflick (1995), Ladd (1997), Weckert (1997), Weckert and Adeney (1997)
Everyone does it	Langford (1995), Baase (1997)
It is so easy to copy software	Weisband and Goodman (1992); Langford (1995)
It doesn't harm anyone	Stallman (1995), see also Weckert (1997), Weckert and Adeney (1997)
The low quality of software	Takeyama (2002)
Software is expensive	Weisband and Goodman (1992) and Baase (1997))
The risk of being caught is minimal	Cheng *et al*. (1997) and Langford (1995).

The reasons listed in this table are discussed in the literature of Computer Ethics, along the lines set out below.

The non-exclusive nature of software has recently been offered as a morally acceptable reason for the unauthorized copying of software. According to this argument, software cannot be bound by ownership or copyright, because software products are immaterial products. Such a view is adopted by (Kuflick, 1995; Ladd, 1997; Weckert, 1997: Weckert & Adeney, 1997).

While scholars regard the reason "everyone else does it" as morally unacceptable, this reason has been discussed in the literature as a potential reason for copying software (Langford, 1995).

The same goes for the argument "it is so easy to copy software" that is also mentioned in literature as a potential reason for copying software (Langford, 1995; Nissenbaum, 1995; Weisband & Goodman, 1992). This line of argument has also found significant empirical support (Cheng *et al*., 1997; Weisband & Goodman, 1992).

The argument that the unauthorized copying of software does not do any harm to anyone is put forward by Ladd (1997), Nissenbaum (1995), Stallman (1995; 1997) (see also Weckert, 1997; Weckert & Adeney, 1997). They argue, for instance, that software copying does not harm anyone as the person copying software does not take anything from the owner. They maintain that by making electronic copies the owner of the software still has the software, despite the fact that others have it as well.

The high cost of software is reported to be one crucial reason why ordinary people tend to copy software (Cheng *et al*., 1997; Weisband & Goodman, 1992).

The argument about the low quality of software ("the quality of software is so bad that it is not worth paying for") is based on the idea that consumers have reservations about the quality of software products (Takeyama, 2002).

The small risk of being caught copying unauthorized software ("although it may be forbidden by law, the risk of getting caught is negligible") is seen to be a major factor behind the practice (Cheng *et al*., 1997; Langford, 1995).

These seven reasons were used as a basis for studying students' reasons for the unauthorized copying of software.

3 Research approach and research subjects

To study these research problems empirically, a quantitative and a qualitative questionnaire were administrated. Questionnaires were given to the students on three courses at a Finnish university. Two of the three courses (1 and 2) were organized by the Department of Information Processing Science in the Faculty of Natural Sciences and one by the Department of Electronic Engineering at the Faculty of Technology (course 3). Course 3, given by the Department of Electronic Engineering, a UNIX course, is compulsory for all students of the Faculty of Technology in order for them to get an email account. Course 1 was an Open University course. Course 1 consisted of 33 people, of whom over half were men (72.7 %). In course 2, 28.3 % of the 106 participants were males. In case of course 3, there were 110

participants, of whom 94.5 % were men and 4.5 were women. In total 249 students filled in the questionnaires.

The anonymous questionnaire was preferred by the researchers over open interviews. This decision was made since open interviews are argued to be an unreliable method of studying the question of unauthorized copying of software owing to its sensitivity (Lin *et al.*, 1997). When handing out the questionnaires to students, it was stressed that the students' identity would not be revealed under any circumstances. For example, it was said to the students that the person analyzing the results had no connection with the course in which the questionnaire was handed out. The questions presented to the students are described in Table 2.

Table 2: The questionnaire

1. The unauthorized copying of software is acceptable because:

Software is expensive __
Everyone else does it __
It is easy __
Although it may be forbidden by law, the risk of getting caught is negligible __
The quality of software is so bad that it is not worth paying for __
Software cannot be bound by ownership or copyright,
because software products are immaterial products __
It doesn't do any harm to anyone __
Other reason __, which is: _____

Does the act of copying focus on the products of a specific software company

Yes ___
No ____

If your earned income were dependent on software development, would it change your viewpoint concerning unauthorized copying of software?

Yes ___
No ____

2. It is not acceptable because:

The act is illegal __
The act is immoral __
Other reason __, which is: _____

I have made illegal copies of software and I still do it/may continue to do it, although I don't consider it acceptable __, because: _____

The first question asked why it is acceptable to copy software, and the respondents were asked to tick the relevant answer, or write another reason if their preferred justification was not mentioned in the questionnaire. It was also asked, whether the act was focused on the products of a specific software company and whether if the respondents earned income were dependent on software business assuming it would change the respondents' viewpoint concerning the acceptability of the unauthorized copying of software.

Alternatively, in the second question in Table 2, the respondents were asked to tick the relevant answer as to why they regarded copying as unacceptable (illegal or immoral). The question "I have made illegal copies of software and I still do it/may continue to do it, although I don't consider it acceptable…" explores whether the respondents have conducted unauthorized copying, even where, they perceive the act as morally unacceptable.

Percentage calculation was conducted on respondents' selections and the interpretive content analysis approach by Lacity and Janson (1994, p. 148) was utilized to analyze the textual responses. In using this approach the contextual circumstances in which respondents frame their answers and the circumstances that influence researchers' interpretations are taken into account. The results of the questionnaire are presented next.

4 The results of the study

4.1 Reasons found in literature vs. survey respondents' reasons

The respondents selected their reason for unauthorized copying of software (cf., Table 2). Table 3 illustrates the relative distribution of reasons given in favour of the unauthorized copying of software.

Table 3. Distribution of reasons given for the unauthorized copying of software.

Rationales	**Percentages**
Expensive	58.2
Minimum risk	23.3
It is easy	16.5
Everyone else does it	14.5
Other reasons	12.0
It doesn't do any harm to anyone	9.6
Low quality	6.8
Software cannot be bound by ownership or copyright	2.4

The argument that "software is expensive" was the most popular answer: it was given by 58.2 % of respondents. The argument "although it may be forbidden by law, the risk of getting caught is negligible" came in second place at 23.3 %.

The reason that copying "is so easy" was supported by 16.5 % of our respondents.

The argument "everyone else does it, too" was considered by 14.5 % of the respondents as a proper reason for copying software. 12.0 % of our respondents gave other reasons for copying unauthorized software (see qualitative results in section 4.2.1).

The argument that the unauthorized copying of software doesn't do any harm to anyone was held by 9.6 % of our respondents.

Only 6.8 % of our respondents saw that "the quality of software is so bad that it is not worth paying for" as a relevant reason for copying unauthorized software.

The argument put forward by computer ethics scholars (Kuflik, 1995; Stallman, 1995; 1997; Weckert, 1997; Weckert & Adeney, 1997) that "software cannot be bound by ownership or copyright, because software products are immaterial products" was the least favorable

rationale for regarding unauthorized copying as morally acceptable. Only 2.4 % of respondents considered this to be a reason for copying software.

Those respondents who regarded copying as acceptable were asked if doing the act was focused on the products of a specific software company, and whether if their earned income were dependent on software development, it would change their viewpoint concerning unauthorized copying of software (see Table 4). As indicated in table 4, 6.1% of those who regarded the unauthorized copying of software as acceptable reported that their copying was focused on the products of a specific software company. Interestingly, 51.5% of those who regarded copying as acceptable reported that they would change their viewpoint if their earned income was dependent on software development.

Table 4: Economic implication of software copying. (n=99; respondents who considered copying software acceptable).

	Yes	**No**	**Data missing**	**Total**
Does the act of copying focus on the products of a specific software company	6.1%	79.8%	14.1%	100.0 %
If your earned income were dependent on software development, would it change your viewpoint concerning the unauthorized copying of software	51.5%	39.4%	9.1%	100.0%

As can be seen from table 5, 43,4 % of our respondents who regarded unauthorized copying of software as unacceptable perceived that it is unacceptable because it is illegal. Only 18,9 % of people who regarded the unauthorized copying of software as unacceptable gave as their reason that is was an immoral act.

Table 5. Reasons why students regard copying as unacceptable.

Not acceptable because:	Illegal	Immoral
%	43.4	18.9

4.2 Qualitative reasons for and against copying

Reasons given for copying

The following three categories emerged from the students' written responses: 1) purpose of use, 2) economic reasons, and 3) legal reasons.

Purpose of use (21 responses)
Reasons in this category relate to the purpose of use (non-commercial use, working purposes at home, studying, testing) or to the way of using the software (temporary use, compatibility reasons). The following examples illustrate these views:

> It is acceptable in non-business use (for example, studying); it is not acceptable for business purposes.
>
> You can not experiment with expensive software before you buy it -> experimenting beforehand makes decision-making easy and gives self-confidence
>
> I feel the licensing fees for multiple machines unreasonably high when I work at home in addition to at work.

Economic reasons (7 responses)
In this category, the reasons for the unauthorized copying of software are based on economic issues. According to the respondents, the motives behind these reasons are poverty (lack of money) and the desire to save money (cost-benefit/efficiency). The following extracts illustrate these views:

> "In [our] family there is an unemployed computer professional who needs to maintain his professional skills, but we have no money, so the only possibility is illegal copying [of computer software]."

> The cost-benefit relationship does not come up to expectations.

> "Consider, for example, games, which one can only play through once, and which cost 250-350 Finnish marks" [40-60 USD/EURO]".

Legal reasons (2 responses)
In this category, the reasons for unauthorized copying of software are based on legal issues. According to the respondents, the law was considered old-fashioned, or it does not consider copying as illegal activity. Examples follow:

> It is not illegal for private individuals (in Finnish law this matter is not a criminal offence as far as individuals are concerned)

> The existing law is bad, inflexible and old-fashioned regarding this issue.

Reasons given against unauthorized copying of software

Reasons why the unauthorized copying of software is unacceptable clustered into three different content categories: negative consequences, free software available, moral and legal reasons and other reasons.

Negative consequences (9 responses)
The reasons in this category are based on the perceived negative consequences of the unauthorized copying of software. According to the respondents, the copying of software brings about following kinds of negative consequences: the quality of software weaken, systems die since people in general are not paying software, the price of software rises and the activity affects honest users. Some respondents wrote:

> It is possible that the software will weaken in quality, if the software does not bring in anything (wide-spread copying).

> The producers of programs lose money and their future production [of software] will suffer.

> The price of software stays high because only a few buy software.

Moral and legal reasons (4 responses)
The respondents perceived immorality or illegality as reasons against unauthorized copying of software. Examples are as follows:

> Immorality; if illegal software is used for earning then that act is immoral.

> If software is copied for to earn money or if it is copied in large amounts or if one earns one's living by copying, I consider those actions immoral. I have legally bought some of the software I use (the software which I really need and perhaps use at work), but I also have copies of software (only one item

of software at this moment). If I ever need a program/programs for purposes of earning my living, I will definitely buy it/them.

Other reasons (3 responses)
Other miscellaneous reasons against copying were given.

Reasons given when respondents do not accept the unauthorized copying of software but still commit the act

The answers of these respondents, who reported that they did not accept the unauthorized copying of software, but nevertheless committed the act (or possibly would commit the act), are presented next.

Economic reasons (40 responses)
The respondents reported economic reasons for committing an act that they find unacceptable. In particular, respondents wrote that software is too expensive or that they are so poor (students) that they cannot afford to buy legal software:

> Lack of money

> I cannot afford to buy all the programs I need

Purpose of use (7 responses)
Respondents perceive different types of use of software as reasons for making unauthorized copies of software. Learning to use software, testing a software product and using multiple workstations at work and at home were given as reasons for coping software:

> I have to [copy software] if I am going to learn to use [software]

> It is fun to test commercial rubbish

> [There is no difference] when I use several computers at home and in office

Everyone else is doing it and availability (4 responses)
Four respondents considered that because everyone else is doing it or because copying is easy, it is acceptable to produce unauthorized copies of software. An example follows:

> Software is expensive, and "everyone" does it sometimes

Other reasons (4 responses).
Miscellaneous reasons, for example, relating to a position of a provider of software, were given.

5 Discussion

The most common rationale for regarding unauthorized copying as acceptable was "software is expensive" (58.2 %). Cheng *et al*. (1997) also found that "*software is too expensive*" was the most important reason for making unauthorized copies of software. The qualitative reasons furthermore revealed two extremes in respect of the "*software is expensive*" argument. At the one extreme, some of the respondents reported that they did not have enough money to buy software. For example, some respondents felt that they needed to have

a software product for purposes of studying and maintaining professional skills, and since they do not have enough money to buy it themselves, they considered copying it justified. At the other extreme, there were people who simply wanted to save money by copying.

The second most common reason for regarding unauthorized copying as acceptable is that there is a minimum risk of getting caught: "*although it may be forbidden by law, the risk of getting caught is negligible*" (23.3 %). This suggests that legal sanctions are a significant consideration for 23.3 % of our respondents. The third most common reason is that software copying is so easy (16.5 %): "[unauthorized] *copying is a handy and easy way to get software*". The fourth reason was "*everyone else does it*" (14.5 %). The rationale with respect to this reason was pretty much straightforward, as the following citation illustrates: "…*everybody is doing it* [too]…" Such a reason is not very convincing as a moral argument, as one can easily imagine a number of malicious activities, which someone somewhere is doing.

The next common reason was "other reasons" (12 %); for these, see the discussion of the qualitative results. The reason that it causes "*no harm to anyone*" for the unauthorized copying of software was the sixth most common reason (9.6 %). The seventh most common reasons was the low quality of software "the quality of software is so bad that it is not worth paying for" (6.8 %). For example, one student explained "*I do not want to pay for software full of bugs*..." The reason that intellectual property, copyright, or moral rights cannot exists because software is intangible and/or non-exclusive, was the least favoured reason offered by the students (2.4 %).

51.5% of those respondents who accepted unauthorized copying of software (51 out of 99 respondents) would change their viewpoint, if their income came from software development. 6.1% of those who accept unauthorized copying reported that their copying is focused on a specific software company. Only one software producer, Microsoft, was mentioned.

The rationales for the unauthorized copying of software were found to form three categories of reasons: purpose of use, economical reasons, and legal reasons. The first category encompasses reasons concerning the use of software. These reasons range from maintaining professional knowledge to copying software that the copiers would never buy. The economic reasons further encompass various arguments. At the one extreme, there were people who regarded themselves as too poor to buy software. On the other extreme, there were people who just wanted to save money. As to the third category, legal reasons, some respondents took the view that the unauthorized copying of software is not banned by Finnish law, or that the law is out-of-date, and therefore they are justified in copying software.

43.4 % of our respondents who regarded the unauthorized copying of software as unacceptable gave as their reason that is it prohibited by legislation. Only 18,9 % of those who regarded the unauthorized copying of software as unacceptable gave as their reason that it is an immoral act. This means that the respondents do not recognize moral viewpoint regarding unauthorized copying of software and that codified norm, the law, may function as means to develop students' awareness of this issue.

The rationales against unauthorized copying were found to form three categories: negative consequences, moral and legal reasons, and other reasons. For example, the negative consequences included the negative affect on the quality of future software and the tendency to

push up the price of software. The rationales given for conducting unauthorized copying of software even if the respondent considered it unacceptable formed four categories: Economical reasons, purpose of use, everyone else is doing it and availability, and other reasons.

5.1 Implications for research and practice

On the basis of the results, three implications were drawn for practice and research (Table 6). These implications are considered next.

Table 6. Implications of this study.

1) Consider students' real-life reasons for doing or avoiding unauthorized copying of software
2) Application of consequential and non-consequential theories of ethics to reasons for and against unauthorized copying of software
3) Legislation and professional codes of conducts versus people's attitudes

With respect to the first implication, the reasons given by students for unauthorized copying of software – namely economic reasons, reasons concerning the law and reasons relate to the use of software - are excellent candidates for inclusion in computer ethics education. Computer ethics educators should ask students in computer ethics courses to scrutinize the respondents' rationales presented in this study in the light of different theories of ethics. Dilemma-based discussion taking up issues from these three categories, while at same time avoiding indoctrination (Hare, 1963, 1975, 1976; Lisman, 1998; Macklin, 1980; Warnock, 1975), is particularly recommended for this purpose. Moral argumentation and dilemma discussion have been shown to develop individuals' moral sensitivity and judgment (Rest, 1994). In practice this means, for example, that educators construct exercises (ethical dilemmas) using the categories so that students can reflect about the reasons given for and against copying. Exemplary exercise questions derived from the data includes: If the law is old-fashioned, does it justify production of unauthorized copies of software? Does poverty justify unauthorized copying of software? If an unemployed individual needs software for developing her professional abilities, is it morally right for her to copy software?

With respect to the second implication, the students' reasons for and against the unauthorized copying of software relate closely to a variety of personal egoistic consequences (cf., arguments such as "*save money*", "*risk of getting caught is minimal*"), while arguments based on deontological or duty-based reasons are rare. To ensure a holistic analysis, the act of copying software should be analyzed using both consequential, including utilitarianism (Pettit, 1993), and non-consequential theories, including Kantian ethics (Kant, 1993), prima facie theories (Ross, 1930; Dancy, 1993), and virtue ethics (Pence, 1993) in computer ethics courses.

Over half of the respondents who regarded copying as acceptable would change their attitude, if their income came from software business. On the basis of this result, we suggest the use of the kind of theories of ethics in education that forces students to think about the issue from the software developers' viewpoint as well. Such theories of ethics include Rawls' (1971) theory of justice and other universalization theses (e.g., Hare, 1981; Mackie, 1981). For example, Collins et al (1994) applied Rawls' (1971) veil of ignorance[i] on software construction and use. Basing an exercise on their study, for example, by asking students to develop a societal contract between software producers and users would develop students' capability in perspective-taking (cf. Piaget 1977).

The third implication suggests that anti-piracy organizations (e.g., BSA), lawmakers, and those who formulate codes of ethics, should pay attention to the three categories of reasons found here when tackling the problem of the unauthorized copying of software. This study offers these parties a more in-depth understanding of the reasons why people copy software. Anti-piracy organizations should realize that not every user does it for economic gain, and that only 23.3 % of people engage in the unauthorized copying of software because the risk of sanctions is low.

5.2 Limitations

As the first limitation of this study it must be emphasized, although its results may be generalized among Finnish university students, they are not generalizable globally. A further possible limitation of the findings is that the sample may suffer from a bias, as people who more often copy software may be over-represented among the participants in these three courses (cf., Seale *et al*., 1998). Although easy to administer questionnaires do not encourage respondents to produce rich descriptions. Therefore, the results represent superficial perceptions. By using face-to-face interviews, we would be able to gain a deeper understanding of the respondents' views. Nevertheless, we believe that we obtained enough of an understanding to see what reasons there are for and against software copying.

6 Conclusions

Even though the issue of the unauthorized copying of computer software has attracted a lot of attention from scholars and software companies, little is known about the reasons why people regard this activity as morally blameworthy or acceptable. Furthermore, little is known about the link between theory and practice with respect to the reasons for copying (or not copying). To address these issues, this paper presented the results of a questionnaire on the specific issue. The most common reason for copying software was "software is expensive" (58.2 %). Our respondents' reasoning differs from the opinions given by computer ethics thinkers. Our respondents' rationales were much more egoistic and consequentialist than those of computer ethics scholars. Finally, the implications of this study for computer ethics education, professional codes of conducts, and anti-piracy organizations were discussed.

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Endnotes:

[i] The veil of ignorance is applied in an imaginary negotiation, with the purpose achieving justice or equality in society. In negotiations behind the veil of ignorance ideally each participant is unaware of who s/he is, of his/her gender, preferences, profession, financial situation, status, and interests are in the society. According to Rawls, the process of deciding behind the veil of ignorance is fair and just, because we are then forced to choose impartially (as we do not know who we are in society). However, under the veil, participants know certain facts, such as inequalities. When deciding on the principles to be followed under the veil, each participant has right to veto an agreement. In this way the least advantaged parties (e.g., disabled people) are protected, because no one knows who s/he will be after the raising of the veil.

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