Chapter 9
A Practical Guide to Ethical Research Involving Humans¹

Norman G. Vinson and Janice Singer

Abstract The popularity of empirical methods in software engineering research is on the rise. Surveys, experiments, metrics, case studies, and field studies are examples of empirical methods used to investigate both software engineering processes and products. The increased application of such methods has also brought about an increase in discussions about adapting these methods to the particularities of software engineering. In contrast, the ethical issues raised by empirical methods have received little attention in the software engineering literature. In this chapter, we introduce four ethics principles of primary importance for conducting ethical research. We additionally discuss and provide examples of applying these principles in the context of ethics review.

1. Introduction

How should an empirical researcher approach subjects?

How should data be collected and stored?

How can a researcher reduce subjects’ unease about being observed?²

Should a company’s name be mentioned in the acknowledgements of a paper?

Each of these real-life issues has an ethical dimension. As such, ethics play a role in the proper management of a research project (Mirvis and Seashore, 1982) which, in turn, affects the project’s success. Accordingly, it is important that empirical


² Several recent publications (e.g. National Health and Medical Research Council et al., 2007) suggest that it is more appropriate to refer to the people under study as research participants rather than research subjects. However others (e.g. Canadian Institutes of Health Research et al., 2005) note that the term “participant” is ambiguous, as it can refer to virtually anyone involved in the research project. To avoid any such ambiguity we will use the term “subject” to refer to those people who are being studied.

researchers understand research ethics and their application. In this chapter, we will introduce the major ethical concepts relating to Empirical Software Engineering (ESE) research with human subjects and provide a practical guide to the ethics review process.

Because empirical research is relatively new to software engineering, discussion of the ethical issues raised by ESE is still in its early stages (Harrison, 1998; Jeffrey and Votta, 1999; Singer and Vinson, 2001, 2002). Therefore, we will rely on information from other fields to support our discussion. Nonetheless, our examples will focus on situations ESE researchers are likely to face.

It is insufficient to simply expect scientists to behave ethically (Beecher, 1966a; McNeill, 1993). In an attempt to minimize unethical behaviour, governments and scientific communities have developed codes of research ethics (McNeill, 1993). By providing a standard of behaviour for researchers to follow, and by helping them reason about ethical issues in specific situations, it is hoped that these codes of ethics will reduce the incidence of unethical behaviour (Anderson et al., 1993; Frankel, 1989; Gotterbarn et al., 1999; McNeill, 1993). However, it is ultimately up to individual researchers to ensure research practices are ethical. In this regard, experience has shown that to behave ethically, people must understand the ethical principles underlying codes of ethics and spend the time and effort required to intelligently apply them to their own circumstances (Anderson et al., 1993; Canadian Institutes of Health Research et al., 2005). To quote the preamble of the ACM/IEEE-CS SE Code of Ethics and Professional Practice, “the Code is not a simple ethical algorithm that generates ethical decisions” (Gotterbarn et al., 1999, p. 104).

Unfortunately, the ESE community has yet to develop its own code of research ethics (Harrison, 1998; Jeffrey and Votta, 1999; Singer and Vinson, 2002). Researchers must therefore try to apply codes from related disciplines to ESE studies. For ESE research practices similar to those of other disciplines, this does not pose a problem. In this vein, codes from the social sciences and computing sciences are especially relevant. However, for research practices more common or even unique to ESE, such as the use of source code as data (see El-Emam, 2001; Vinson and Singer, 2001), the existing codes are of little value. In these cases, ESE researchers will have to reason from ethical principles to determine an ethical course of action. To support such reasoning, we provide a detailed explanation of the main principles of ethical research in the first section of this chapter. We also describe some common problems in applying these principles to ESE projects and present solutions to those problems.

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3Scientific research raises a host of ethical issues such as the assignment of authorship, the relationship between graduate students and their advisors, and scientific fraud. These issues apply broadly to most research disciplines (Committee on Science, 1992, 1993, 1995). Computer science and software engineering research raises additional issues (Wright, 2006). In this chapter, we will ignore broad issues to instead focus on the ethical issues raised by the researcher/subject relationship in ESE; issues such as those highlighted above.