

CSC2130

Ethics and validity of empirical research in
software engineering

Preliminary Guidelines for ESSE

- Research in medical and ESSE is bad
 - Small sample size
 - Difficult to replicability
- Consider experiment context, design, execution, analysis, presentation, interpretation
- Hypotheses should have theoretical foundations
- Keep designs simple
- Don't overclaim
- Mention excluded data and limitations

Discussion: Preliminary Guidelines

- How do the issues/best practices in this paper translate into other subfields of CS?
- Context: How to decide which parameters are relevant, given the sheer complexity of real-world scenarios?
- Design: What problems get in the way of obtaining a randomized sample? What mitigating steps can be taken?
- Does a control group make sense in some situations for SE? In other fields of CS?

Discussion: Preliminary Guidelines

- To what extent can SE experiments be replicated?
- Do page limits in academic papers discourage reporting of statistical precautions and details?
- What implications are there for making raw data available (even under confidentiality agreements)?

Ethical Issues in ESSE

1. Informed Consent

- Perception of what should be private is more important than reality

2. Scientific Value

- Importance of research topic
- Validity of results

3. Beneficence

- Minimize risk/benefit for individuals and organizations

4. Confidentiality

- Difficult with small companies

5. Ethical considerations should be made before the study begins!

Discussion: Ethical Issues in ESSE

- Informed consent
 - How much detail to give to participants about a study?
 - Sometimes we need deception about the research goal to conduct the study
 - How can we ensure a randomized sample while allowing people to opt out of a study?
 - What can researchers and managers do to avoid coercing employees into participating?
 - How can participants be remunerated? Should they be remunerated?
 - Can it be something non-monetary?

Discussion: Ethical Issues in ESSE

- **Beneficence**

- How do we measure risks and benefits?
- How can we balance social and individual good, especially when they run contrary to each other?
- Risks and benefits are not always obvious, certain or predictable. What due diligence should researchers take?

Discussion: Ethical Issues in ESSE

- Confidentiality
 - How to handle the need to access raw data for replication and verification vs the need for confidentiality, esp in domains like medicine, military
 - Some observational techniques like ethnography and critical incident analysis make it difficult to maintain confidentiality. Workarounds?
 - How much can confidentiality eliminate the need for informed consent?
 - Example: Google re-captcha

Discussion: Ethical Issues in ESSE

- What other codes of ethics can be relevant? HCI, psych, soci, business management...
- What light does the TCPS2 shine on research ethics in SE/CS? What issues do we face locally at U of T in doing ethical research (IRB issues, etc)?
- Should conferences/journals request all submissions to provide ethics review (or reasons for a lack of it)?
- What ethical issues arise in other subfields of CS?
- How do Academic-Industrial Partnerships weigh into this? (NDAs, etc)