

Empirical Strategies

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[Types of Research]

- We can identify two main types of research for empirical studies
 - Exploratory Research
 - Explanatory Research
- The two types are complementary rather than competitive

[Exploratory Research]

- It is concerned with studying objects in their natural settings
 - Letting the findings emerge from observations
- It has a flexible research design
- It is usually supported by qualitative data

[Explanatory Research]

- It is mainly concerned with quantifying a relationship or comparing groups
 - The aim often is to identify a cause-effect relationship
- It is usually conducted through a controlled experiment (fixed design)
 - Supported by quantitative data
 - Promotes comparison and statistical analysis

[Quantitative vs. Qualitative]

- A quantitative investigation can answer
 - How much a new inspection method decreases the number of faults found in tests?
- A qualitative investigation can answer
 - What are the sources of faults between different inspection groups?

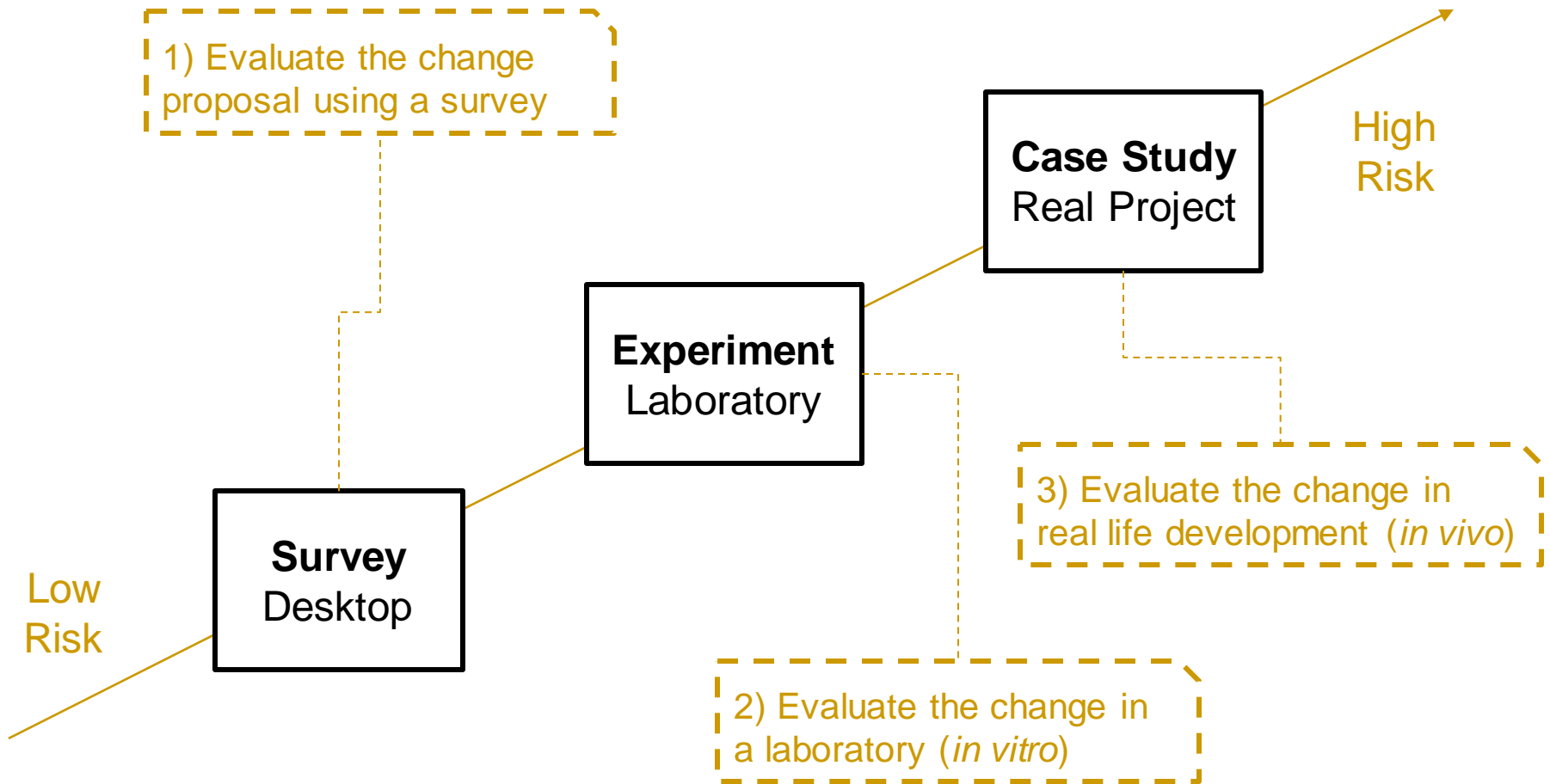
[Empirical Strategies]

- The main empirical strategies are
 - Survey
 - Case Study
 - Experiment / Quasi-Experiment
- Empirical strategies are not orthogonal
 - Some studies may be viewed as a combination of strategies

[Comparative Table]

	Survey	Case Study	Experiment
Design Type	Fixed	Flexible	Both
Qualitative / Quantitative	Both	Both	Quantitative
Execution Control	No	No	Yes
Control of Measure	No	Yes	Yes
Costs	Low	Medium	High
Replication	High	Low	High

Strategies Used Together



[Bibliography]

- C. Wohlin et al. **Experimentation in Software Engineering**, Springer. 2012.
 - Chapter 2 - Empirical Strategies (Sections 2.1 and 2.5)