

Handout

1. Research Questions

Experiment research questions do not only ask, whether a relationship between two variables exists, but also aims at revealing the underlying cause by investigating causality.

Examples: "How does display size affect user satisfaction?", "How does text length affect user comprehension?"

2. Hypotheses

A hypothesis defines both the variables involved and the relationship between them. For example, A causes B; A is larger, faster, or more enjoyable than B; etc.

Examples: "A larger display leads to better performance.", "Longer texts lead to less user comprehension."

3. Defining needed variables

Defining the variables, by translating theoretical concepts into recordable variables. Two main variables are of interest: the dependent variable (DV) and the independent variable (IV).

Intervention/Manipulation (IV): How can the IV be changed between the experimental conditions?

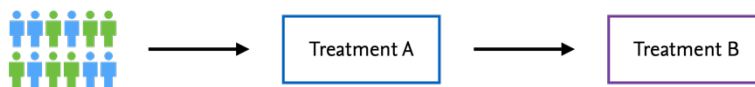
Metric/Measurement (DV): How can a change in the DV be measured?

Examples: "A larger display leads to better performance." → IV: display size, DV: performance
"Longer texts lead to less user comprehension." → IV: text length, DV: comprehension

4. Specifying Research Design

For experiments there are two basic research designs for obtaining different treatment groups:

Within-subjects design - Getting measurements from the participant group before and after receiving the treatment:



Between-subjects design - Differing the treatment between two participants groups:



4. Planning statistical analysis

The statistical analysis depends on the research design, data type, data distribution and many other aspects. This aspect is complex and depends on many factors. Your design has to be either simple enough or you need a consultation with the fu:stat.

Ressources: <http://www.stat.fu-berlin.de/en/index.html>,
https://www.methodenberatung.uzh.ch/de/datenanalyse_spss.html,
<https://stats.oarc.ucla.edu/other/dae/>. | <https://stats.oarc.ucla.edu/other/examples/>