Current Topics in Media Computing and HCI

S02 Experimental Research

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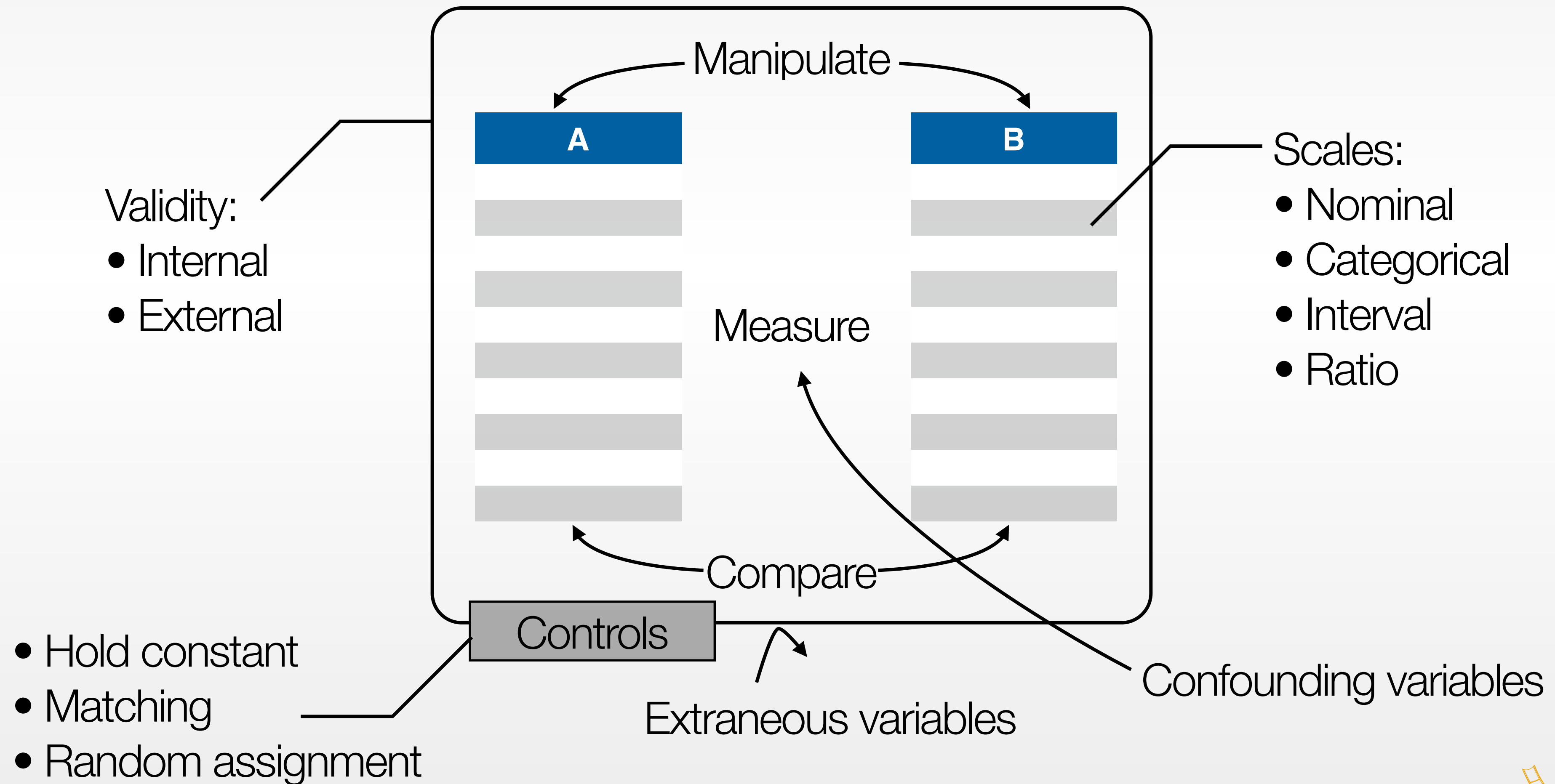Summer term 2017

http://hci.rwth-aachen.de/cthci

Operationalization

- Hypothesis "Young participants will have significantly better memories than older participants"

- How could we study this?

- Variables?

- Operationalization?

Operationalization

- **Hypothesis** "Participants aged between 16 - 30 will recall significantly more nouns from a list if twenty than participants aged between 55 - 70"

Basic Elements of Experimental Study

Validity:
- Internal
- External

Manipulate

A

B

Scales:
- Nominal
- Categorical
- Interval
- Ratio

Measure

Compare

- Hold constant
- Matching
- Random assignment

Controls

Extraneous variables

Confounding variables

BREAK

User Study Protocol*

- A document that explicitly states why a research project is being conducted and how

- Purpose:

  - Clearly state the research question and hypotheses

  - Plan the research procedure in details

  - A guide for all involved personal

  - Monitor research progress

*(O'Brien and Wright, 2002) How to write a protocol

Protocol Structure:
The Research Problem

- Title - "Evaluating the performance of a new keyboard layout"

- Research problem - "We intend to find if our new keyboard layout performs faster and with less errors than the QWERTY keyboard. The new layout would lead to smaller form factors."

- Context - "There have been many new layouts that appear to perform faster than QWERTY but lead to fatigue [X, Y, Z]"

- Aim (derived from context)

- Hypotheses - "There is no difference in typing speed between the new layout and QWERTY"

Protocol Structure:
The Research Method 1/2

- Independent variables & dependent variables (levels, operational definition, measurement scale and unit)

- Task - "The user will perform a composition task using statements from MacKenzie et al. (CHI 2003). The participant will do the following activities to complete the task…"

- Subjects/Participants (number, main characteristics, criteria to include or exclude them)

- Experimental design (within or between groups and how the conditions will be assigned)

Protocol Structure:
The Research Method 2/2

- Experiment setup and/or apparatus (such as hardware or special features in the testing space)

- Experiment procedure (what the experimenter will do to setup the testing space)

- Data analysis methods

- References

- Include images or sketches if informative

- Write this section in future tense

Extranous Variables

- Situational

  - Control

- Participants

  - Counterbalance

- Experimenter bias

  - Clear procedure