MMI 1
User Study Design

some more info

Author: Alexander De Luca + Bettina Conradi (for lecture MMI1 SS11) - LMU Munich

Qualitative vs. Quantitative Data

- deals with descriptions
- data can be observed but not measured
- colors, textures, smells, tastes, etc.
- Qualitative -> Quality

- deals with numbers
- data which can be measured
- length, height, area, volume, speed, costs etc.
- Quantitative -> Quantity

Oil Painting

Qualitative data:

- blue/green color, gold frame
- smells old and musty
- texture shows brush strokes of oil paint
- peaceful scene of the country

Oil Painting

Quantitative data:

- picture is 40 cm by 60 cm
- with frame 45 cm by 65 cm
- weighs 4 kilogramm
- costs 300€

Types of Data

- Nominal
- Ordinal

non-parametric

- Interval
- Ratio

parametric

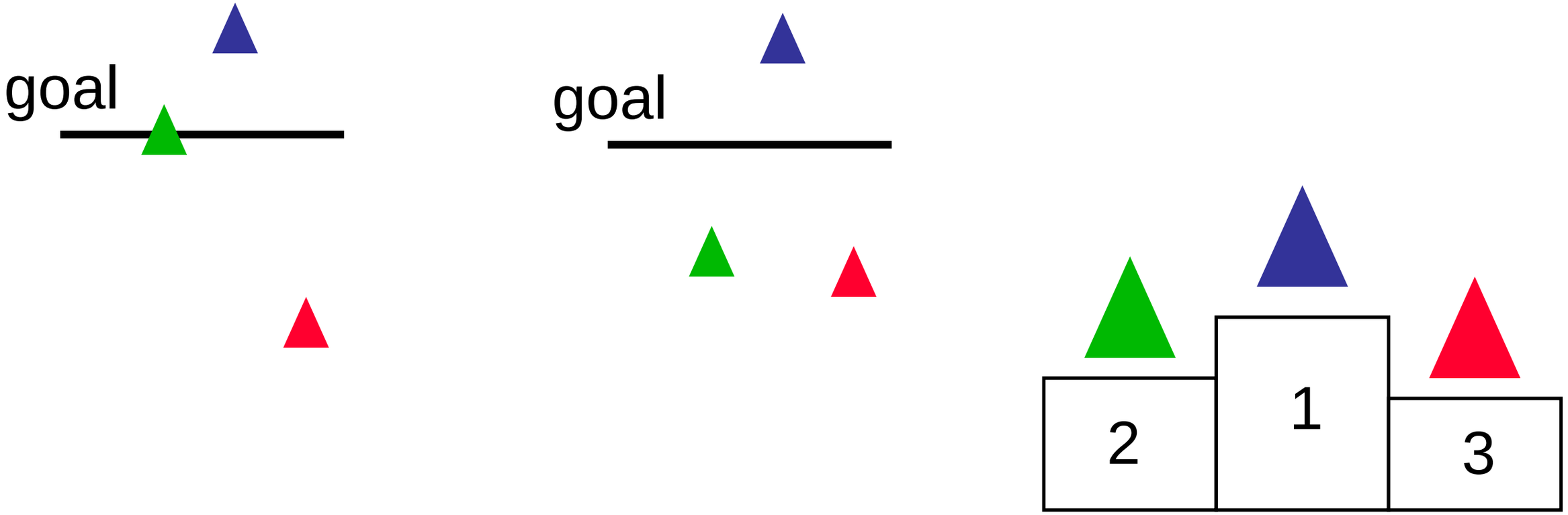
more information

From Field, A., Hole, G. How to Design and Report Experiments. (book)

Ordinal vs. Interval

- ordinal provides an order
- doesn‘t tell anything about the differences

- example: triangle race



From Field, A., Hole, G. How to Design and Report Experiments. (book)

Likert Scales

- used to „measure“ opinions
- participants give ratings
- Attention: there is a huge discussion going on whether likert scale data is ordinal (non-parametric) or interval (parametric)*

centered

1. fully agree
2. agree
3. neutral
4. disagree
5. totally disagree

uncentered

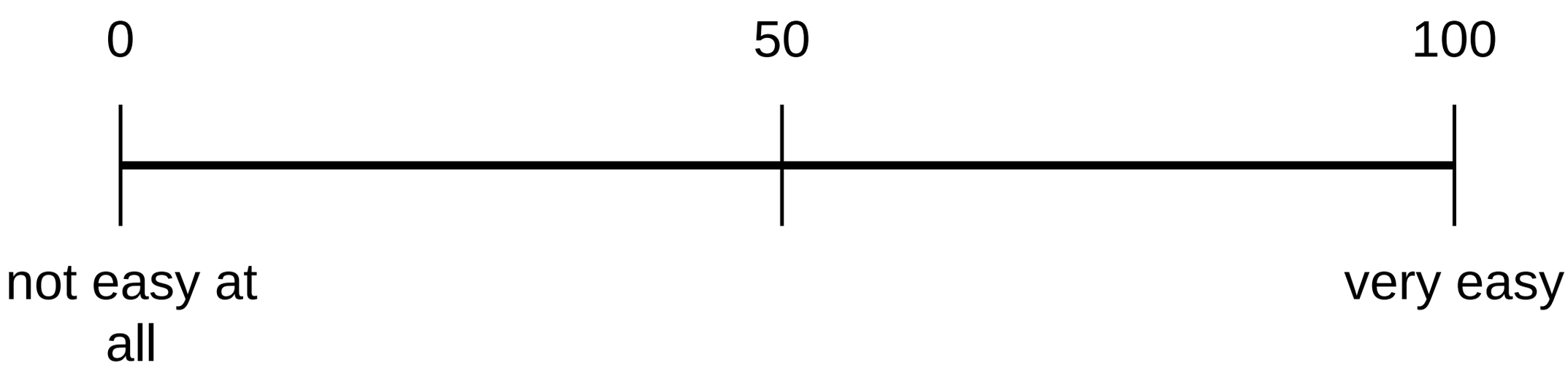
1. fully agree
2. agree
3. disagree
4. totally disagree

* Computer scientists believe it is ordinal (without a question). Please read the following blog entry for information and implications: http://cacm.acm.org/blogs/blog-cacm/107125-stats-were-doing-it-wrong/fulltext

Visual-Analog Rating Scales

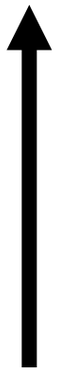
- no categories
- advantage: users cannot remember their response

How easy to use was the prototype?



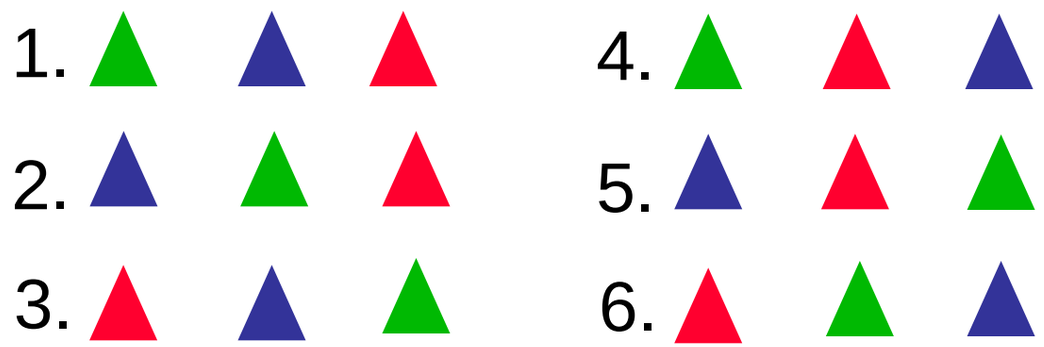
Learning aka Experience Curve Effect

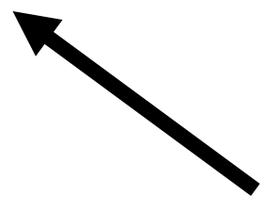
- people get better over time
- to avoid influences on the experiment:
  - use perfect counterbalancing if possible
  - Latin square designs
  - randomization
  - other designs



better

Example: One variable with 3 levels. 3! = 6 arrangements.





counterbalanced

Example 1

You developed a new file preview system for Windows, which in your opinion is more useful than the existing systems. Whenever a user clicks on a file, the file will be instantly opened on the users tablet PC and closed once another file is clicked.

Design a user study to find out whether your claim (more useful) holds.

1. Hypotheses
2. Independent and dependent variables
3. Measurement tools

Example 2

You want to evaluate the efficiency of the Google voice search on mobile devices. Using it enables users to use voice commands to enter search terms. The basic idea is to replace (or enhance) standard text input as a mean of entering search terms.

1. Hypotheses
2. Independent and dependent variables
3. Measurement tools

Further Material and Must-Read

- Lewis, J.R. IBM computer usability satisfaction questionnaires: psychometric evaluation and instructions for use. International Journal of Human-Computer Interaction, 1995. http://drjim.0catch.com/usabqtr.pdf
- Robertson Judy. Stats: We’re Doing it Wrong. http://cacm.acm.org/blogs/blog-cacm/107125-stats-were-doing-it-wrong/fulltext
- Greenberg, S. and Buxton, B. Usability evaluation considered harmful (some of the time). In Proceeding of CHI '08.111-120. http://doi.acm.org/10.1145/1357054.1357074
- Field, A., Hole, G. How to Design and Report Experiments. (book)