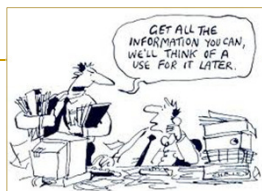


## Questionnaire Design



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## Overview

- General quality criteria of scales
- Prepare and select "good" items
  - Reverse items
  - Item difficulty (spread)
  - Inter-item correlation
- Determine the quality of your scale
- Prepare a presentation of your scale
  - (Presentation this afternoon)

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## Quality criteria of scales

- **Reliable:** measures the quantity or concept in a consistent or reproducible manner
- **Valid:** measures the quantity or concept that is supposed to be measured
- **Unbiased/objective:** measures the quantity or concept in a way that does not systematically under- or overestimate the true value
- **Discriminating:** can distinguish adequately between respondents for whom the underlying level of the quantity or concept is different

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## Quality criteria of scales: Item properties

- Recode reversed items
- Item difficulty
  - Proportion of "agreement" to the item
  - "Spread" of answers across scale points
  - Goal: items should differentiate well between people
$$\frac{\text{Sum of scores across all persons}}{\text{number of persons} * (\text{number of scale points} - 1)}$$
  - Values 0.2 through 0.8 recommended
- Inter-item correlation
  - Relation of a single item with others
  - Eliminate items that are different from all others
  - Value  $\geq 0.3$  recommended

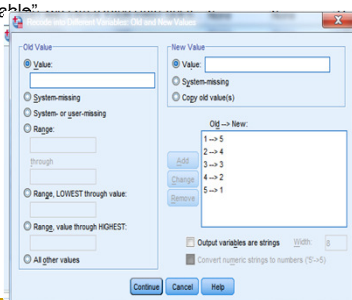
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## Quality of your scale: Item properties

- Recode reversed items
- Transform
  - "Recode into different variable"
  - Select reversed items
  - Add new name
  - -> "Change"
  - "Old and new values"



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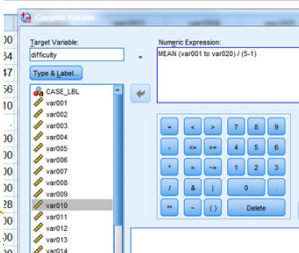
5

## Quality of your scale: Item properties

- Item difficulty
    - Proportion of "agreement" to the item *across respondents*
    - Average response / number of scale points - 1
  - SPSS: Data -> Transpose...
    - Select all (recoded) variables from left into right box
    - **! Do not select the external item !**
    - Transform -> compute variables
- Type:  
**MEAN (var001 thru var020) / (5-1)**
- Delete all variables except **difficulty** and **CASE\_LBL**
  - Note items for which difficulty **< .2 or > .8**
  - Eliminate from scale

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## Quality of your scale: Item properties

- Inter-item correlation
- File -> Open ->
  - Analyse -> Scale -> Reliability analyses
- Select all items of your scale **but**
  - Use recoded and not original ones
  - Exclude items with "bad" difficulties
- Look at output file
  - Note items in "corrected inter-item correlation" column when  $< 0.3$
  - Eliminate from scale

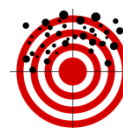
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## Quality criteria of scales

- Reliability
  - Does the scale measure anything at all?
  - Consistency of a measure
  - Do we get the same result repeatedly?
- Validity
  - Does the test measure what we want it to measure?



Unreliable &amp; Unvalid



Unreliable, But Valid



Reliable, Not Valid



Both Reliable &amp; Valid

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## Quality of your scale: Reliability

- Inter-item correlation
- File -> Open ->
  - Analyse -> Scale -> Reliability analyses
- Select all items of your scale **but**
  - Use recoded and not original ones
  - Exclude items with "bad" difficulties
  - Exclude when "corrected inter-item correlation"  $< 0.3$
- Look at output file
  - Cronbach's alpha: range 0 to 1
  - Insufficient  $< .5$
  - Satisfactory  $< .7$
  - Good  $> .7$

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## Quality of your scale: Validity

- Correlation with external criteria
- Transform -> Compute Variable
- Target Variable: *name of your scale (e.g. "happiness")*
- Numeric Expression: type *Mean (..)*
- Select all items which had good properties, i.e. difficulties, inter-item correlation

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## Quality of your scale: Validity

- Correlation with external criteria
- Analyse -> Correlate -> Bivariate
- Select scale name and external item
- Correlation should be fairly low ( $< .3$ ) and not statistically significant

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## Test your research hypothesis

- Overall mean
- Analyse -> descriptive statistics -> descriptives
- Mean by your chosen grouping variable
- Analyse -> compare means -> independent sample t-test
- Try custom graphs and tables

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## Report on your scales

- What was your concept?
- What was our research hypothesis?
- Which items had to be eliminated and why?
  - Give some examples
- Reliability (alpha), discriminant validity (r)
- Overall mean
- Mean by your chosen grouping variable
- Results of your research (t-test)
- Discussion
  - What went well and what not so well, and why