Topic 3 Study unit 4

Topic 3 Study unit 5
STEPS IN DEVELOPING A PSYCHOLOGICAL MEASURE

- Specifying the **aim** of the measure
- Defining the **content** (related to the purpose)
- Test **specifications** (test format – stimulus (item) and response (answering) format)
- Writing the **items**
- **Reviewing** the items
- **Assembling** and **pretesting** of the measure
- **Item analysis** (difficulty-value, discrimination-value, item bias)
- **Selecting best items** for the final version
- Administration to **standardization** sample
- Establish **norms**
- Compiling the **test manual**
- Submitting the measure for **classification**
- **Publishing and marketing** the measure
- **Ongoing** revision and refinement
ITEM ANALYSIS
Classical test theory (CTT)

• Item difficulty \((p)\)
  – proportion/percentage of individuals who answer the item correctly
  \[ p \text{ value} = \frac{\text{number of people who answered item correctly}}{\text{number of people who took the measure}} \]

• Item discrimination \((D)\)
  – Performance on item compared to upper and lower 25% of test takers
    • Positive \(D\) – item discriminates between extreme groups
    • Negative \(D\) – item with poor discriminating power
  – Item-total correlation
ITEM ANALYSIS
Item Response theory (IRT)

• Item **difficulty** and **discrimination** more accurately determined
• Item parameters property of item not the group
• Item **response curve**
• Item **bias** and **differential item functioning** (DIF)
CROSS VALIDATION

• No measure perfect after one administration
• Second administration of refined measure (after item analysis) to another representative sample
• New validity coefficients calculated
• Shrinkage of validity coefficient due to sample size and item pool
STATISTICAL ANALYSIS OF ITEM BIAS

• Validation of measure
• Bias - systematic error in measurement – measure not valid due to different scores for subgroups
• EEA – bias and fairness
CROSS-CULTURAL TESTING

• Principles of IRT (a-, b- and c-values; ICCs)
• Bias analysis and Differential Item Functioning
• Equivalence
• Judgmental designs vs Statistical designs
CROSS-CULTURAL TESTING (continue)

• Translation
  – converting measure from one language to another (new language)

• Adaptation
  – more applicable to specific context while using the same language ($ vs R)
  – Reasons for adaptation
  – Considerations/process (Administration, item format, time limits)
Lessons

• Various aspects to consider when developing a new measure
• The performance of each item in a measure should be analysed
• New measure needs to be “tested” more than once before it can be published as a psychological instrument
• Cross-cultural testing have many challenges – SA
• Statistical methods to determine bias and DIF