

Empirical Research Methods 1

Topic: Standardized questionnaires and construction of a new questionnaire

Instructor: Albulene Grajcevcic

Tutors: Shravani & Piumal

Session 4: November 20th, 2023

Agenda

- Common ground: Questionnaires, tests, surveys, and instruments
- Types of items
- Types of tests
- Advice for developing your items and instrument

COMMON GROUND: DEFINITIONS OF QUESTIONNAIRES, TESTS, SURVEYS, AND INSTRUMENTS

Common ground: Questionnaires, tests, surveys, and instruments

- ◇ Measure: a procedure for obtaining data
- ◇ Construct: “abstract idea, underlying theme, or subject matter that one wishes to measure using survey questions” (Lavrakas, 2008, p. 133)
- ◇ Item: the basic building block (or element) of an instrument
- ◇ Scale: a group of items that are seek to measure one dimension of the variable of interest.
- ◇ (Research) Instrument: a tool or procedure used to measure (and quantify) subject characteristics
- ◇ Questionnaire: a written set of questions that a respondent completes typically used for research purposes which can be both qualitative as well as quantitative in nature.
- ◇ Test: an instrument meant to assess the ability to present a correct answer to a specific item/question, i.e. it measures performance
- ◇ Survey: a research method composed of instruments (e.g. tests, questionnaires, interviews) and it's also a broader concept that describes content, method, and analysis of the data obtained from the instruments

Common ground: Questionnaires, tests, surveys, and instruments

Good news!

The words: “measure”, “scale”, “instrument”, “questionnaire”, “test”, and “survey” are more or less used interchangeably when discussed informally

Same case for the words “item” and “question”

Extended definition of Construct

Two slides ago, there was a general definition of what a construct is. Here's what goes after that:

“Some constructs are relatively simple (like political party affiliation) and can be measured using only one or a few questions, while other constructs are more complex (such as employee satisfaction) and may require a whole battery of questions to fully operationalize the construct to suit the end user's needs. Complex constructs contain multiple dimensions or facets that are bound together by some commonality that, as a whole, compose the construct.

Without clearly conceptualizing the construct's dimensions and the common theme binding the dimensions together, the survey developer runs the risk of either creating a set of questions that does not measure all of what is intended or creating a set of questions that measures dimensions of an unintended construct.” (Lavrakas, 2008, p. 133-134)

1. For the (complex) construct “employee satisfaction”, what are some dimensions that could be used to compose this construct?
2. To which Quality Criteria is the author referring at the end of the quoted text (highlighted in green)?

TYPES OF ITEMS

Most common types of items use in EduTech Research

Questionnaires in EduTech Research

◇ Goal: Measuring...

- ▣ Demographic aspects
- ▣ Attitudes / opinions
- ▣ Knowledge outcomes and knowledge gain

Why would we (i.e. EduTech professionals) be interested in measuring demographic aspects or attitudes?

Example: Open item to measure knowledge

Translation Describe how one can solve the tasks of problem 6

Beschreibe, wie man die Aufgaben von Problem 6 lösen kann.

Example: Closed items to measure knowledge:

Translation

Add one of these signs: > or < or =

Ergänze eines der folgenden Zeichen: > oder < oder =

$$2 \quad \boxed{<} \quad 3$$

$$\frac{1}{4} \quad \boxed{\phantom{<}} \quad \frac{3}{4}$$

$$\frac{1}{3} \quad \boxed{\phantom{<}} \quad \frac{1}{2}$$

$$\frac{1}{8} \quad \boxed{\phantom{<}} \quad \frac{1}{4}$$

$$\frac{2}{10} \quad \boxed{\phantom{<}} \quad \frac{1}{5}$$

$$\frac{4}{8} \quad \boxed{\phantom{<}} \quad \frac{4}{12}$$

$$\frac{16}{17} \quad \boxed{\phantom{<}} \quad \frac{13}{14}$$

$$\frac{5}{2} \quad \boxed{\phantom{<}} \quad 2$$

Example: Closed items to measure attitudes

Beispiel: Wie sehr magst du die große Pause?



Wie sehr magst du Mathe?



Wie gerne lernst du alleine?



Wie gerne lernst du mit anderen zusammen?



Wie gerne gehst du in die Schule?



Smileyometer (Read, 2008)

Translation:

Example: How much do you like breaks (in school)?

How much do you like mathematics?

How much do you like learning alone?

How much do you like learning with others?

How much do you like going to school?

Attitude: feeling or opinion
about something or
someone [1]

Schmitt, L. J., & Weinberger, A. (2019). Fourth graders' dyadic learning on multi-touch interfaces - versatile effects of verbalization prompts. *Educational Technology Research and Development*, 67(3), 519-539. doi:10.1007/s11423-018-9619-5

[1]: <https://dictionary.cambridge.org/es/diccionario/ingles/attitude>

Example: Closed and open items to measure demographic aspects

Translations

Geburtsdatum:

Birth date

Monat	Jahr
Month	Year

Geschlecht:

Gender

☐ weiblich
Female

☐ männlich
Male

Händigkeit:

Handedness

☐ links
Left

☐ rechts
Right

Hast du schon einmal ein so genanntes Multitouch-Gerät benutzt?

(iPad, iPhone, Smartphone usw., das heißt Geräte bei dem man mehrere Finger benutzt)

☐ ja Yes

☐ nein No

Have you used a multi-touch device before? (iPad, iPhone, Smartphone, i.e. devices where you use multiple fingers)

Wenn ja, besitzt du ein eigenes?

If yes, do you own one?

☐ ja
Yes

☐ nein
No

Welches?

Which one?

TYPES OF TESTS

Types of tests: speed and power

	Speed test	Power test
Distinguishing feature	<u>How many</u> questions can be answered in the allotted time	<u>How well</u> each (complex) question can be answered in the allotted time
Items	Contains lots of (simple) items of limited scope	Contains a small set of (complex) items of practically unlimited scope
Expected answer	The methods to answer are clear	The methods to answer are not obvious
Use case example	For selection processes at the administrative and clerical level	For selection processes on graduate, professional or managerial level

Types of tests: performance and aptitude

	Performance/ability test	Aptitude test
Distinguishing feature	Designed to determine <u>achieved knowledge</u> in certain subject	Designed to determine <u>potential</u> for success in a certain area
Advantages	Efficient way to get an idea of how well students are performing	Tests offer objective comparisons, improve the quality of hiring through training needs assessment
Disadvantages	Too much emphasis on passing a test ignoring critical and creative thinking	Costly & tailored to the various positions Focus of Test?
Use case example	To test if students have met specific learning goals or not at each grade level.	To determine which types of career each student might be best suited for

Types of tests: personality and attitude

	Personality test	Attitude test
Distinguishing feature	Measures <u>human character or disposition</u>	Measures the <u>opinion</u> regarding an event, person or object
Use case example	Assess clinical disorders and who needs counseling. Identify individual differences for promoting better communication	Used in marketing to determine individual/group preferences for items, brands or services
Concrete example	DISC (Dominance, Influence, Compliance, Steadiness) personality profile	Net promoter score (NPS)

Types of tests

1. From the 6 types of tests shown above, do you think a test can belong to more than 1 of these types?
2. Do you think that one test is better than other?

BTW

We will go more in-depth about the topic of questionnaires next semester in ERM2.

ADVICE FOR DEVELOPING YOUR ITEMS AND INSTRUMENT

General tips that apply to any type of item or instrument you want to develop

How to formulate items

- ◇ Positive wording: no double negative
- ◇ Simple sentences
- ◇ No undefined abbreviations, (technical) terms fitting to target group
- ◇ Only one construct per item
- ◇ No generalized expressions (always, never, no one...)
- ◇ No evaluation words/ descriptive adjectives
- ◇ Concretize time spans (“in the last two weeks”)
- ◇ No leading question

How to start and develop your instrument

- ❖ Clearly state your intentions with the research. Will it provide info to answer your research question(s)?
- ❖ Include instructions and any other necessary information (e.g. consent, legal disclaimers, debriefing) in your instrument
- ❖ Don't ask for information you don't need (Why not?)
- ❖ **Pilot test your instrument at least once**