

Welcome to my seminar „Fundamentals of Questionnaire Design and Analysis using lab.js and R“

Albert-Ludwigs-Universität Freiburg



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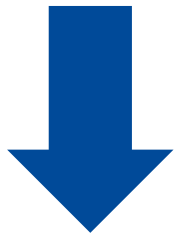
14.12.2021

Julius Fenn, M.Sc.

Questionnaire



oral



Interview

written



Questionnaire

- Questionnaire
 - Observations of typical behaviour
 - not necessarily predefined assessment/classification criteria
 - e.g. personality traits, motivation, emotions, attitudes,

- Test
 - assessment of maximum performance
 - predefined assessment/classification criteria
 - e.g. abilities, skills, stage of development

Questionnaire: Definition



Data collection instrument for recording social and political attitudes, opinions, interests and psychological traits



Not everything can be investigated with questionnaires

Questionnaire - Example



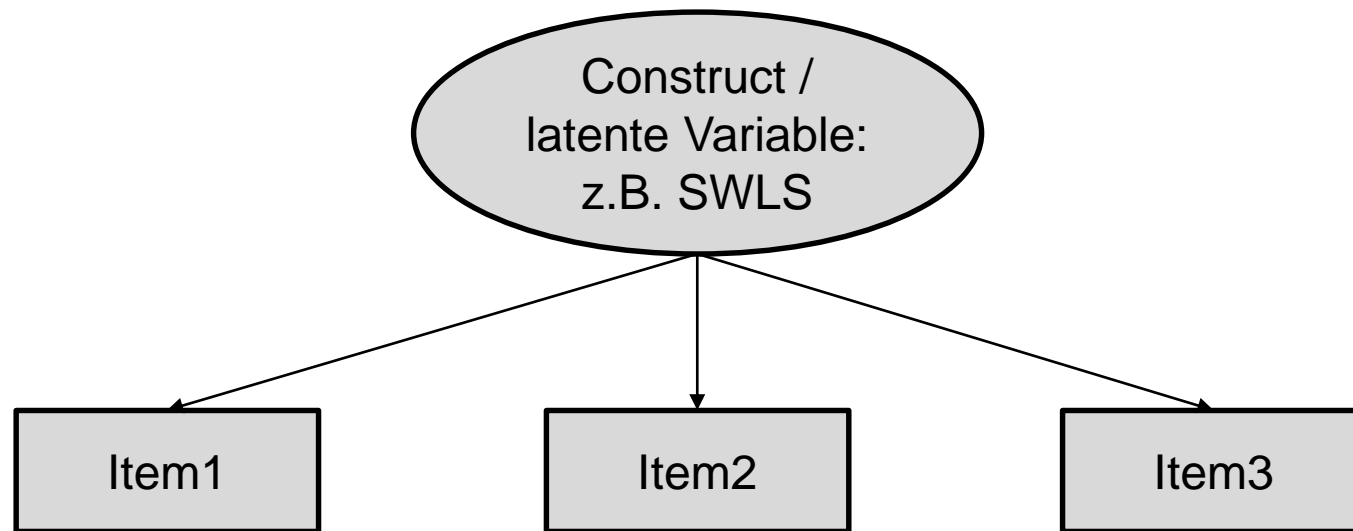
Satisfaction with Life Scale (SWLS):

		Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
1.	In most ways my life is close to my ideal.	1	2	3	4	5	6	7
2.	The conditions of my life are excellent.	1	2	3	4	5	6	7
3.	I am satisfied with my life.	1	2	3	4	5	6	7
4.	So far I have gotten the important things I want in life.	1	2	3	4	5	6	7
5.	If I could live my life over, I would change almost nothing.	1	2	3	4	5	6	7

1) What do I want to measure?

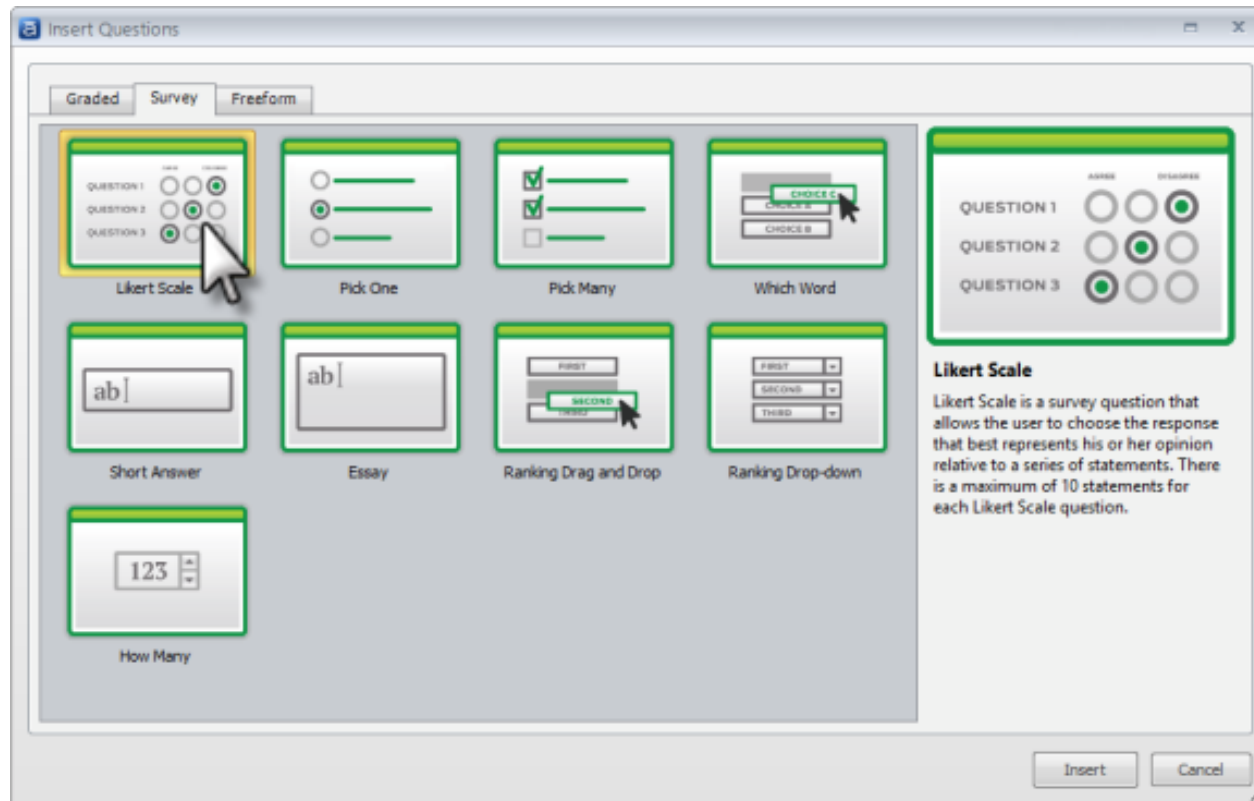


- Specification of a "characteristic of interest" to be recorded
 - Characteristic = numerically measurable variable
 - Characteristic = quantitative or qualitative specification of the characteristic



2) How do I actually ask this?

- Types of survey questions



> free response format must be coded afterwards (evaluation objectivity)

Example I



* 2. How likely is it that you would recommend this company to a friend or colleague?

NOT AT ALL LIKELY

EXTREMELY LIKELY

0	1	2	3	4	5	6	7	8	9	10
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Source: <https://www.surveymonkey.com/mp/survey-question-types/>

Example II



5. What changes would this company have to make for you to give it an even higher rating?

3) What do I have to pay attention to?



Our judgements in questionnaires can be influenced by a wide variety of factors, which can affect the validity of the measurement.

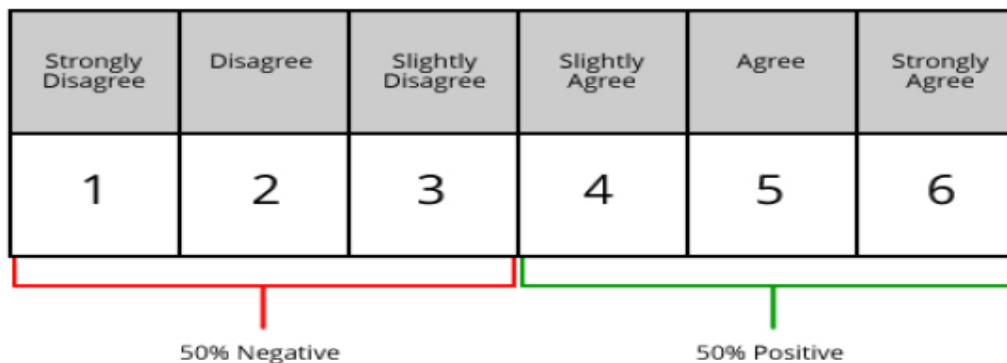
What potentially distorting aspects - among others - do you have to watch out for when designing questions?

Group work 10 min - Please collect in mentimeter

3) What do I have to pay attention to?



- Imagine that respondents are asked to answer the following two questions on a 6-point Likert scale:
 - Should something be done about climate change for future generations?
 - Would you be willing to accept personal restrictions for the fight against climate change?



> What would you suppose?

3) What do I have to pay attention to?

High variance



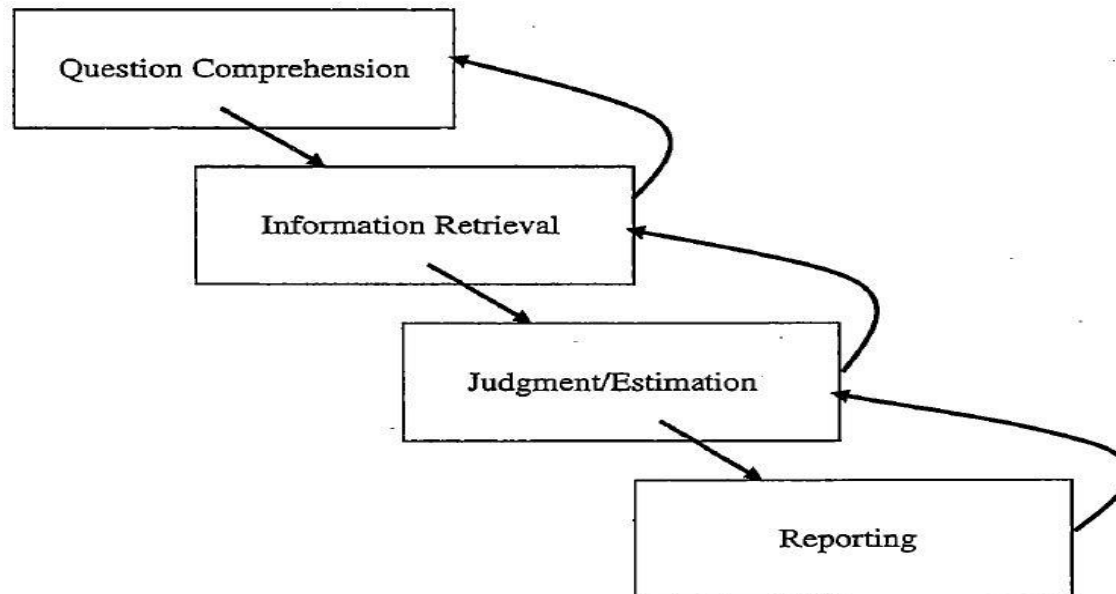
- we want to achieve a high variance in the items (all response options are used)
 - the variance or covariance (for multiple items) is the most important building block for the statistical models
- the response to the items should be independent of other people or the order of the items
- ...

3) What do I have to pay attention to?

CASM



- Superficial model: „Cognitive Aspects of Survey Methodology“
 - tries to explain how people arrive at an answer:



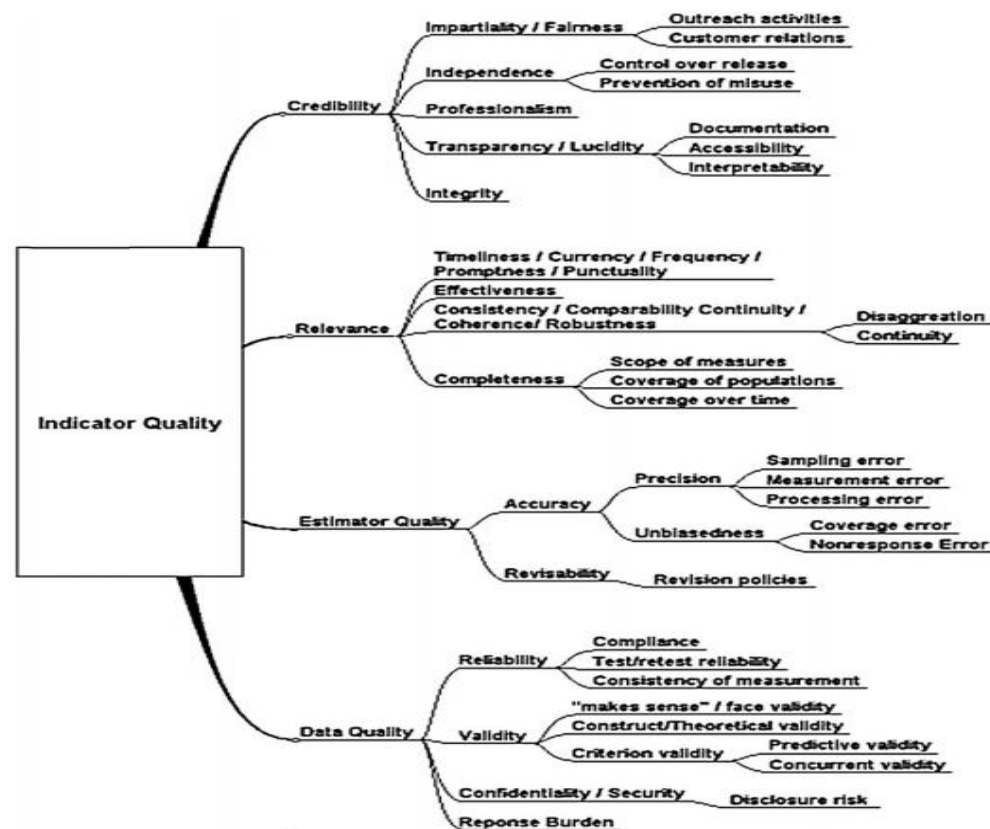
> an excellent template for identifying possible sources of error

3) What do I have to pay attention to?

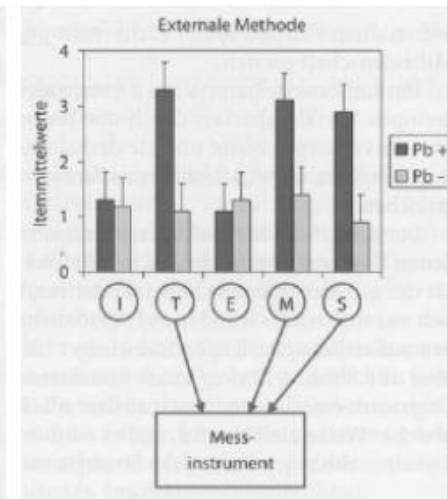
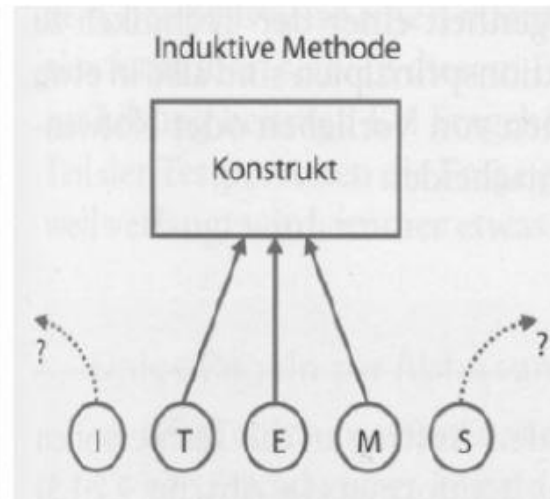
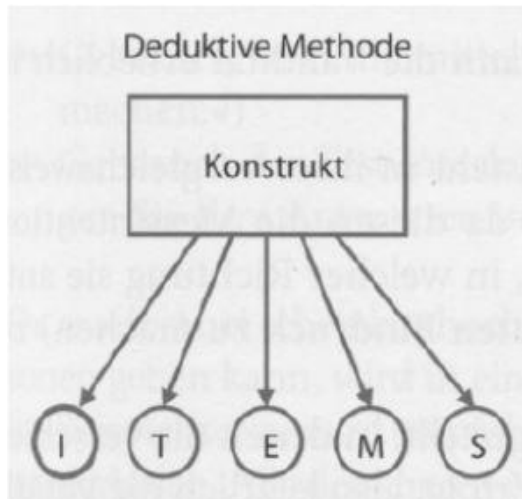
Total survey error



A variety of further quality criteria of indicators were developed by the „Key National Indicators Initiative“ (2005):



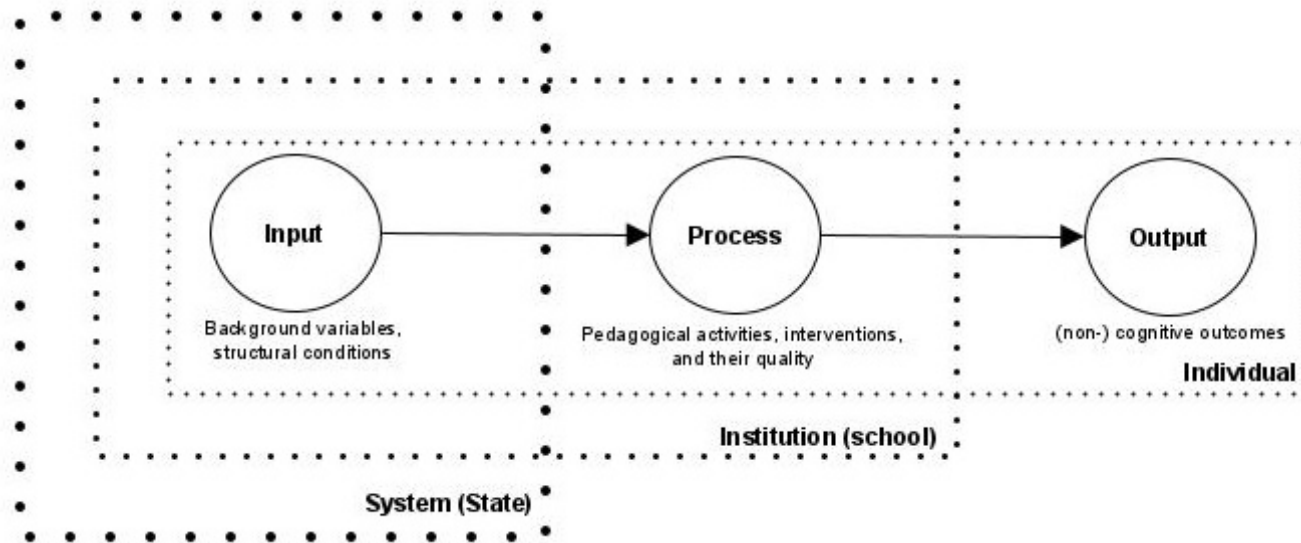
4) How do I choose / construct questions?



- **Deductive method:** based on an existing theory that provides a good description of the trait (Big Five, HEXAGON).
- **External method:** questions are designed to empirically discriminate between groups (Minnesota Multiphasic Personality Inventory).
- **Inductive method:** questions are grouped that are highly correlated with each other

S. 97 bis 112 in Schmidt-Atzert, L., & Amelang, M. (2018). Psychologische Diagnostik. Springer Verlag.

4) How do I choose / construct questions? deductive method I



- „Context-Process-Input-Output (CIPO) Model helps to find relevant questions for studies from a structural perspective

Example: Learning outcomes (output) are mediated by the student's motivation (process) and are dependent on prior knowledge (input).

4) How do I choose / construct questions? deductive method II

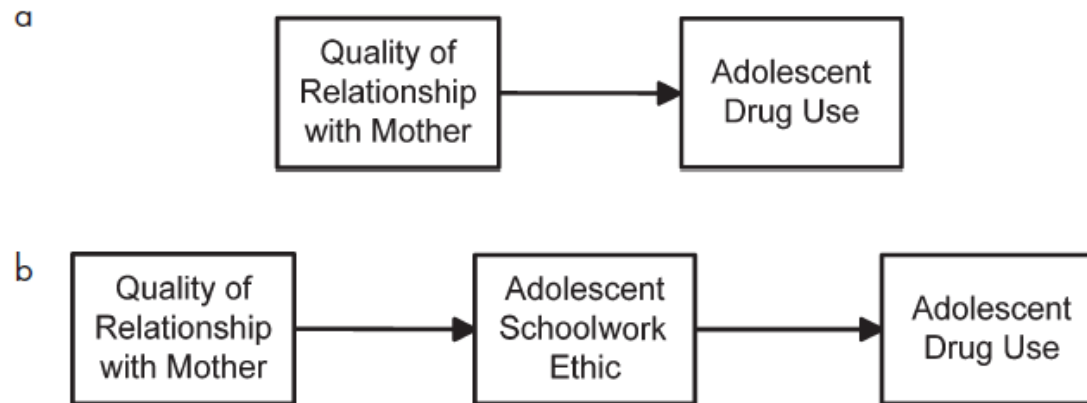


FIGURE 7.2. Examples of direct and indirect relationships. (a) Direct relationship; (b) indirect relationship.

- For research questions in the context of questionnaires (often correlative designs) it is very helpful to draw theories graphically

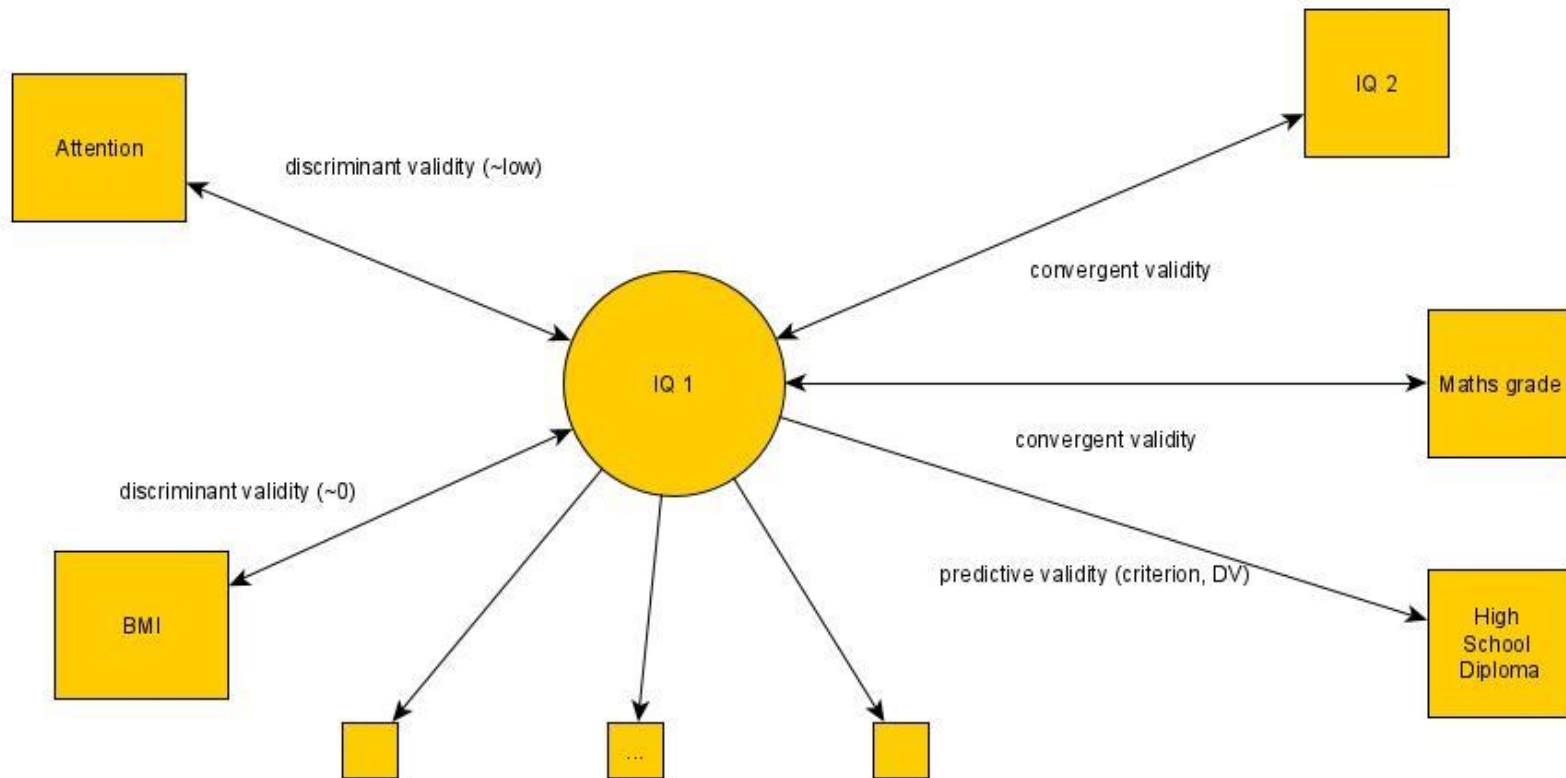
Kapitel 7 in Jaccard, J., & Jacoby, J. (2019). *Theory construction and model-building skills: A practical guide for social scientists*. Guilford publications.

4) How do I choose / construct questions?

deductive method III



Construct validity: indicates the extent to which a test or survey procedure measures a characteristic of interest in a way that is consistent with existing construct definitions and theories



Cronbach, L. J., & Meehl, P. E. (1955). Construct validity in psychological tests. *Psychological bulletin*, 52(4), 281-302.