

Questionnaire Design II



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Overview

- Formulation
- Validity and Reliability
- Translation
- Preparation
- The Pretest and Pilot

Introduction

- Purpose
- Difficulties
- Proper Planning

Formulation

- Defining the Domain
- Types of Questions
- Vocabulary
- Formulating the Questions

Defining the Domain: Class Discussion

Proposed Research Study:

Graduates of Vanderbilt University School of Medicine (VUSM) are successful.

- The Research Question
- Literature Search
 - Existing Questionnaires

Types of Questions: Open-ended

- Examples
 - How would you describe success?
 - What are the primary tasks you perform at work?
- Advantages
- Disadvantages



Types of Questions: Closed

- Examples

1. What is your annual salary?
2. On a scale of 1 - 10, where 1 is dislike and 10 is like, rate how well you like your job.

- Advantages

- Disadvantages



Types of Questions: Semi-closed

- Example

1. What role have you taken the most in published research?

- Author
- Reviewer
- Other (specify)

- None
- Don't Know



Defining the Domain: Brainstorming Session for Questions

In small groups on a sheet of paper, write one open, closed, and semi-closed questions and the choices of answers for graduates of VUSM that would help us understand the proposed research study: Graduates of Vanderbilt University School of Medicine have a strong impact on published research.

Vocabulary

- Appropriate Language
 - Slang
 - Ethnic
 - Regional
- Familiar Language

Fixin' to

Wuz up?

Y'all I recon'

Cocodrie

Props

Dot gone

Formulating the Questions: Class Discussion

Discuss the following questions requested to be answered by graduates of Vanderbilt University School of Medicine:

- a. Are you an editor of a journal or a reviewer?
- b. Have you recently had an article published?
- c. Don't you believe receiving grant money is the most important aspect of successful research?
- d. Out of the published research that you have contributed to, what was the highest impact factor?
- e. How often have you bribed someone in order to be published?

Formulating the Questions: Class Discussion on Biases

a. Are you an editor of a journal or a reviewer? Double-barrelled

Solution: Make two separate questions.

b. Have you recently had an article published? Vague words

Solution: Try different words and ask others for feedback.

c. Don't you believe receiving grant money is the most important aspect of successful research? Leading

Solution: Reword the question. On a scale of 1-10...

Formulating the Questions: Class Discussion on Biases

- d. Out of the published research that you have contributed to, what was the highest impact factor? *Ambiguous/Technical jargon/Relies on memory*

Solution: Reword. Try not to rely too much on recall.

- e. How often have you bribed someone in order to be published?
Sensitive

Solution: If you must ask sensitive questions, try giving a lead sentence such as: Some researchers have admitted buying lunch, sending a gift.....

Formulating the Questions: Other Biases

- Complex
- Insensitive measure: Scale of 1 – 2 – 3 vs. 1 – 10
- Too few categories
- Missing and/or overlapping intervals
- Horizontal vs. vertical response format
- Length of questionnaire
- Placement of questions
- Skipping questions and branching
- Cultural differences
- Avoid hypothetical questions

Formulating the Questions: Other Biases (Dillman, 2007)

- Do not use, check-all-that-apply question formats
- Choose question wordings that are comparable to previous collected data
- Consider questionnaires as conversations. Do not switch topics often. It gives the appearance of not listening to the responder.
- Choose the first question carefully. It should apply to everyone and be easy and interesting.
- Ask one question at a time. Ex: Moral Distress frequency and occurrence
- Use spacing
- Use bold for questions and light print for answer choices

Group Activity:

Revise your questions



Validity and Reliability

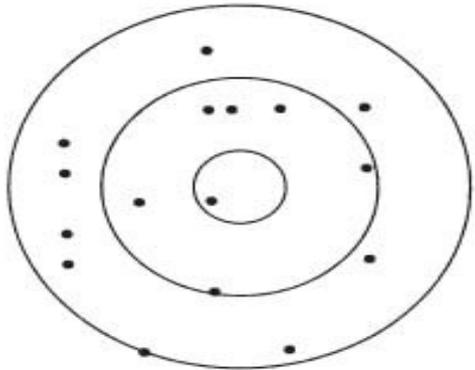
- Reliability
 - Test-Retest Method
 - Equivalent Form
 - Internal Consistency
- Validity
 - Internal and External
 - Face
 - Content
 - Criterion
 - Construct

Reliability and Validity

- There are different definitions for the types of reliability and validity
- Reliability refers to the consistency of a set of measurements.
- Validity refers to what degree the research reflects the given research problem.
- A measure may not be valid if it is not reliable.

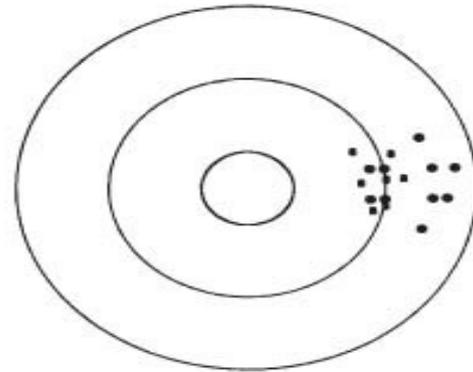
<http://www.experiment-resources.com/research-methodology.html>

Reliability and Validity



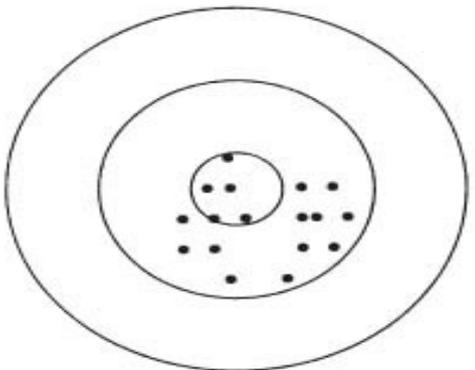
Neither valid nor reliable

The research methods do not hit the heart of the research aim (not 'valid') and repeated attempts are unfocussed



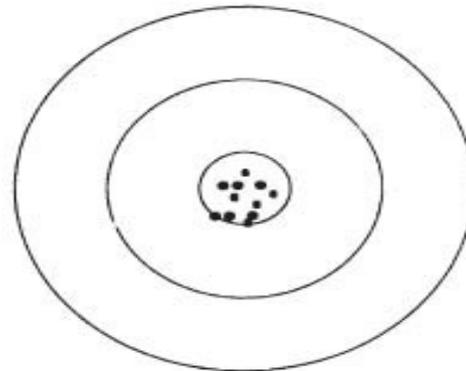
Reliable but not valid

The research methods do not hit the heart of the research aim, but repeated attempts get almost the same (but wrong) results



Fairly valid but not very reliable

The research methods hit the aim of the study fairly closely, but repeated attempts have very scattered results (not reliable)



Valid and reliable

The research methods hit the heart of the research aim, and repeated attempts all hit in the heart (similar results)

Reliability: Test-Retest

- The same instrument is provided to the same subjects twice.
- The instrument should produce similar results.
- An issue with this method is finding the appropriate time to re administer the instrument.
 - Ex: If a pre-survey is administered regarding knowledge of HIV before an intervention workshop, the post-survey will most likely give very different results. However if a post survey is given and the same survey is given in three weeks, you would expect the results to be similar.

Reliability: Equivalent Form

- Different versions of the instrument are created
- Results should be similar

Reliability: Internal Consistency

- Items on the measure should provide consistent scores.
- Split-halves Test
 - Compare the odd questions to the evens
 - Should correlate well

Validity: Internal and External

- Internal
 - Measures the confidence in which there is a cause-effect relationship.
 - “Could there be an alternative cause, or causes, that explain my observations and results?”
- External
 - Can the results be generalizable to a larger population
 - “To what populations, setting, treatment variables and measurement variables can this effect be generalized.”

<http://www.experiment-resources.com/external-validity.html>

Validity: Face

- At “face value” does the instrument make sense.
- Does not require expert opinion.
- Arguably the weakest type of validity
- Sometimes it is difficult to measure or get experts opinion
- Ex of Face Validity: A survey may be given to patients with irritable bowel syndrome regarding the syndrome. They may be asked to comment on if the relevant questions were asked.

Validity: Content

- How well does the instrument represent every characteristic of the construct
- Usually requires expert opinions
- Statistical analysis should be considered

Validity: Criterion

- Criterion Validity: How well does a measurement estimate or predict certain abilities
 - Concurrent
 - Predictive
- The major differences deal with the time of administration

Validity: Concurrent

- Concurrent Validity – How well does a measure correlate with another measure of the same type?
- Concurrent suggest that the measures should be given (approximately) at the same time.
- Ex: If two different IQ tests are given, they should correlate well.

Validity: Predictive

- Predictive Validity – How well does a measure predict a construct in the future?
- Ex: A survey may be given to understand if medical students receiving this lecture will be inclined to create a survey later in their careers. We may see if there is a correlation with the number of surveys designs they participate in once they have worked as a physician for 10 years.

Validity: Construct

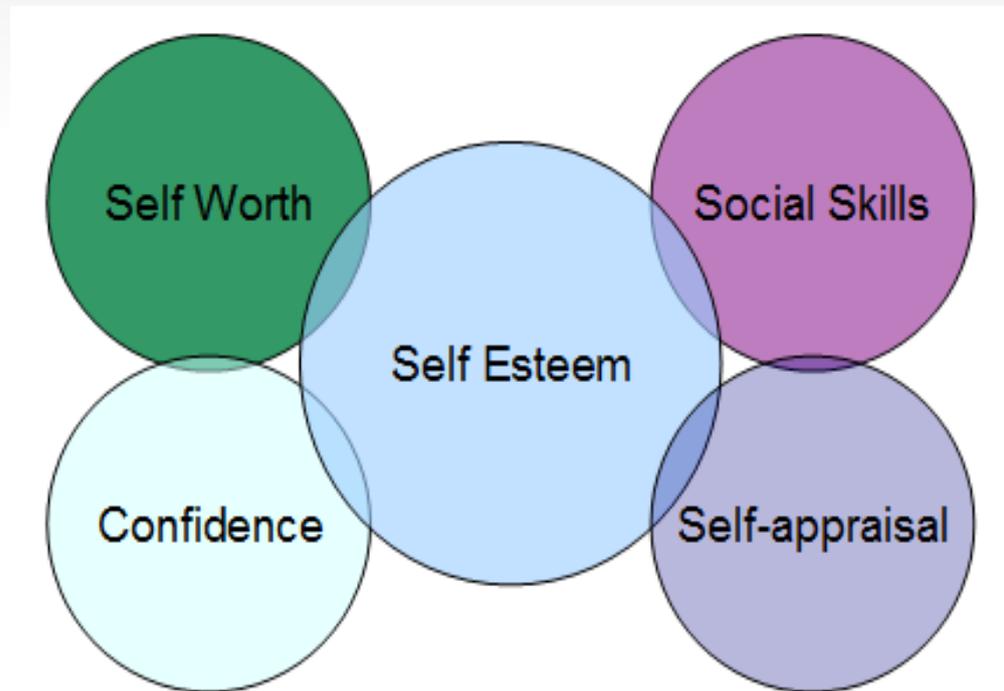
- Construct Validity – How well does the construct measure what it is suppose to be measuring?
- Arguably the most important validity and difficult to prove.
- Ex: A survey measuring medical students' *wellness*. Wellness is an abstract, theoretical construct.
- If you can prove convergence and/or divergence, this may be enough.

Validity: Convergent and Divergent

- Convergent Validity – Do constructs relate to **expected** constructs they should be related to?
- Divergent Validity – Is the construct unrelated to construct **believed** to be unrelated?

Validity: Convergent

- The construct, Self-Esteem, should relate with all other constructs. Self-worth and confidence should relate and social skills and self appraisal should too.



Translation

“Out of sight, out of mind”

“Invisible and insane”

Translation

- Preliminary Translation
 - Expert Evaluators
 - Back Translation
- Cross-language Equivalence

Preparation

- Type of Analysis
- Establishment of Codes
 - Open-ended Questions
 - Closed Questions
- Code Book
 - Live Document
 - Precision and Completion
 - Record of Algorithms

Preparation

- Clearly define the purpose of the study.
- Provide clear and concise instructions.
- Discuss the policy on confidentiality
- Discuss the person's right to refuse any question(s).
- Include identifying data on multi-page questionnaires.

The Pretest

- Purpose

Considerations

- Appropriate Wording and Questions
- Blank Answers
- Right Sample
- Skip Patterns
- Read Body Language
- Interpretations Similar
- Length
- Request Feedback from Subjects
- Listen to Feedback
- Software (Zoomerang, Adobe Live Cycle Designer, SurveyMonkey.com, REDCap Survey)

Pilot Test

- The pilot test is a formalized small scale administration
- Some Questions
 - How is the response rate?
 - Are there questions that are not being answered?
 - Is relevant information being obtained from open-ended questions?
 - How much variability is occurring for each item?

Conclusion

- Start as Soon as Possible (ASAP)!
- Don't Recreate the Wheel!
- Pretest and Pilot the Right Population
- Review, Revise, and Test

References

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Questions?