

A MIXED-METHODS APPROACH TO QUESTIONNAIRE DEVELOPMENT

Understanding Students' Interpretations of Library Survey Questions

Heather Gendron
University of North Carolina Chapel Hill
hgendron@email.unc.edu

Alisa Rod
Ithaka S+R
alisa.rod@ithaka.org

Library Assessment Conference
Seattle, WA
8/4/14

OUTLINE

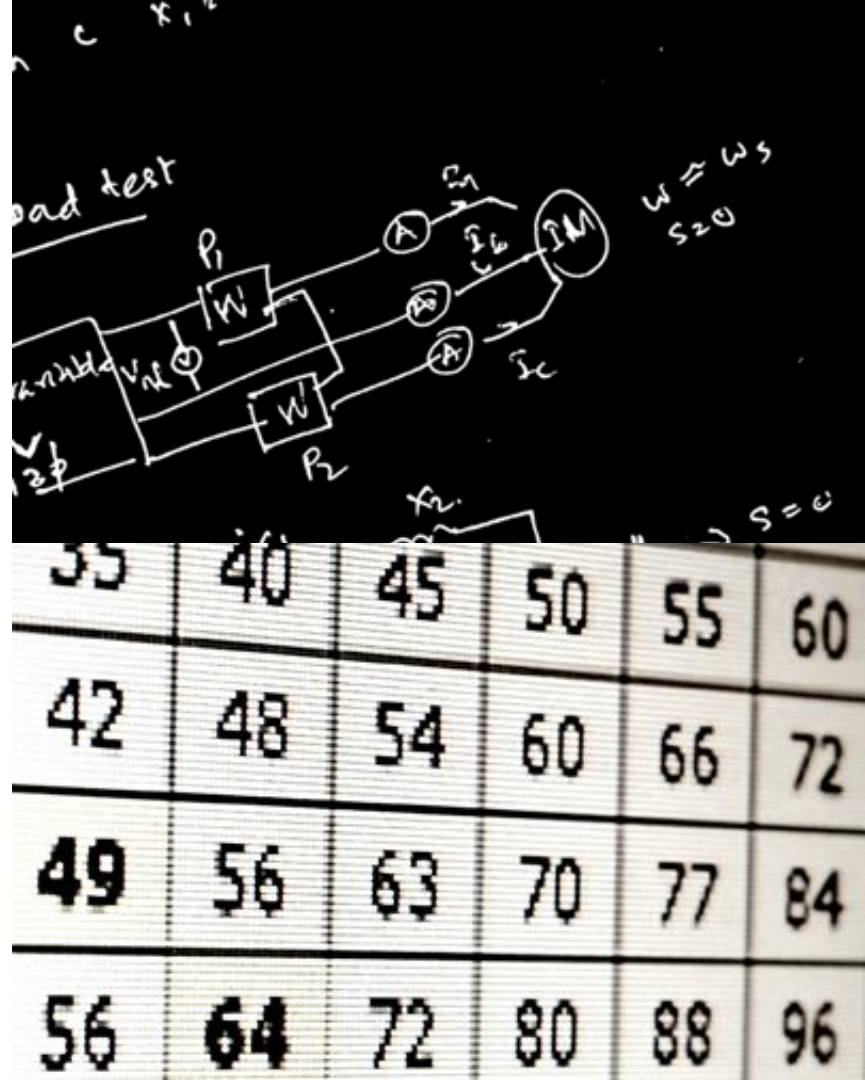
1. Questionnaire Development:
Best Practices (Validity)
 2. Cognitive Interviewing
 3. UNC Chapel Hill Qualitative Pre-
Test Phase
 4. Factor Analysis
 5. UNC Chapel Hill Pilot Study –
Quantitative Test Phase
-

QUESTIONNAIRE DEVELOPMENT

BEST PRACTICES: VALIDITY

Developing the Ithaca S+R Student Survey instrument:

- » Advisory committee (face and content validity)
- » Qualitative pre-testing (response process validity)
- » Quantitative pilot testing (construct validity – factor analysis)



COGNITIVE INTERVIEWING

“The poodle has 9 puppies. The collie has 5 puppies. How many more puppies does the poodle have?”



“How many more
puppies does the
poodle have *than*
the collie?”

Willis, Gordon B. *Cognitive interviewing: a tool for improving questionnaire design*. Thousand Oaks, CA: SAGE Publications, Inc., 2005. doi: <http://dx.doi.org/10.4135/9781412983655>.



What is a “cognitive interview”?

A qualitative method for testing questions that may be problematic, due to the cognitive processing involved in answering those questions.

Iterative process that uses think-aloud exercises and verbal probing.

APPLICATION OF COGNITIVE INTERVIEWS

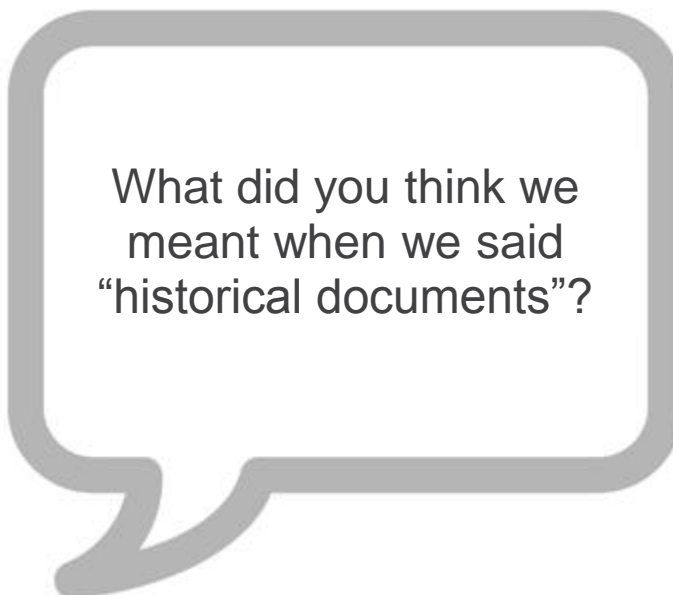
*Use this process reveal
latent problems &
improve upon known
problems, leading to
better design of:*

- » Interview questions
- » Focus group questions
- » Survey questions
- » Poll questions
- » Instructions for participants

CATEGORIES OF C.I. QUESTIONS

(Willis, 2005):

- » Instructions
- » Clarity of question wording
- » Assumptions
- » Knowledge and memory
- » Sensitivity and bias
- » Response categories
- » Other problems (e.g. “Can you tell me more about that?”)



What did you think we meant when we said “historical documents”?

BASIC STEPS TO C.I.

1. *identify potentially problematic questions in your questionnaire draft & develop probing question(s) for each*
2. *write a script for interviewers*
3. *conduct interviews*
4. *analyze responses (written summary, group discussion)*
5. *revise questionnaire*
6. *interview participants to test your revised questions*

MULTIPLE APPROACHES

Whole or Partial?

1. *Participant completes whole survey.*
2. *Participant completes only select survey questions.*

Timing of C.I.

1. *Conduct interview **after** participant takes survey.*
2. *Conduct interview **as** participant is taking survey.*

C.I. INTERVIEW TIPS

1. *Encourage interviewees to be as specific as possible:*

“What are you reflecting on right now?”

“What event were you thinking about when you said...?”

2. *Use visual (nodding, eye contact) and verbal (hmm, uh-huh) cues*
3. *Note-taking vs. recording*
4. *Pace yourself*

UNC CHAPEL HILL QUALITATIVE PRE-TEST

UNC CHAPEL HILL STUDY: PRE-TEST

Prior to study:

- » Ithaka S+R draft survey questions
- » Survey already conducted at 1 institution
- » Trained graduate student assistant
- » Pre-tested our C.I. instrument on 3 students (2 grad, 1 undergrad)

Methodology:

1. Sample: 20 students (5 Ph.D., 5 Master's, and 10 undergraduates)
2. IRB reviewed and approved
3. Incentives provided – gift cards (compliments of Ithaka S+R)

Survey draft: answer choice included “historical documents”

C.I. Question: What did you think we meant when we said “historical documents”?

(Undergrads)

- » “I wasn’t sure about that. I thought maybe speeches people had given or old laws, I do little with history so that threw me for a loop.”
- » “I thought it was referring to a facsimile or copy of a historical document. A really old historic news article or something that was super noteworthy. I’m not a 100% sure. I’ve not taken a History class in 4 years.”
- » “ I think of the Declaration of Independence and Anne Frank’s diary.”
- » “Anything that’s fact and really old, at least way out of my generation. I don’t use anything super old so I don’t...I didn’t think much of it. If it isn’t recent to me, it’s somewhat historical I guess.”

New Wording:

“Collection(s) of historical documents or records (such as rare books, hand-written letters or diaries, artifacts, etc.)”

Survey draft: “The library has an archive that I use for my coursework or research”

C.I. Question: “What did you think we meant by ‘an archive’?”

(Undergrads)

- » “I was just thinking that there’s a sector of nursing coursework, an online database where I can look for nursing related things. I’m not sure if an archive is physical or virtual.”
- » “I thought of the reserve reading books. I’m sure there is an actual archive of historical docs or art pieces the typical definition. Things set aside to a certain collection.”
- » “I thought of the reserve reading books. I’m sure there is an actual archive of historical docs or art pieces the typical definition. Things set aside to a certain collection.”

New Wording:

“The library stores, organizes, and keeps track of books, articles, data, images, or other resources”

Survey draft: “Librarians or library staff provide assistance or guidance about coursework or research at any time of day or night (24/7)”

C.I. Question: “How did you decide to answer this question the way you did?”

(Graduate students)

- » “I was thinking about chatting online with a librarian if I run into a wall and need help finding a resource. (I answered ‘important’) instead of very important because it doesn’t need to be at 2am”
- » “I don’t always need 24/7. I don’t work in the middle of the night – some people do.”
- » “Seems silly to me to have librarians on call 24/7.”

FACTOR ANALYSIS

What is “factor analysis”?

A multivariate statistical technique used to determine if a set of questions all measure an underlying construct

Procedure to simplify a large number of variables (e.g. survey questions) into a smaller set of latent variables/factors (the “common denominators”)

APPLICATION OF FACTOR ANALYSIS

Use FA to:

- » Reduce the number of questions in a survey instrument
- » Determine the construct validity of a survey questionnaire
- » Determine the structure of variables (attitudes, behaviors, knowledge, etc. as operationalized by survey questions)
- » Provide evidence for theory-building or for testing hypotheses



Example:

Agree/disagree scale:

- » I love puppies
- » Puppies are my favorite
- » I hate puppies
- » Puppies are boring
- » Playing with puppies is a waste of time
- » I always look forward to playing with puppies
- » I would like to have more opportunities to play with puppies
- » Playing with puppies is energizing

Example adapted from the writing example in: Hof, Melanie. "Questionnaire Evaluation with Factor Analysis and Cronbach's Alpha: An Example"
Accessed from http://www.let.rug.nl/nerbonne/teach/remastats-meth_seminar/student-papers/MHof-QuestionnaireEvaluation-2012-Cronbach_Factor_Analysis

FACTOR ANALYSIS: EXAMPLE, CONT.

Factor 1

- » I love puppies
- » Puppies are my favorite
- » I hate puppies
- » Puppies are boring

Factor 2

- » Playing with puppies is a waste of time
- » I always look forward to playing with puppies
- » I would like to have more opportunities to play with puppies
- » Playing with puppies is energizing

UNC CHAPEL HILL
QUANTITATIVE TEST
PHASE

PILOT STUDY

Ithaca S+R Student Survey pilot:

- » UNC Chapel Hill one of six pilot sites to field the Ithaca S+R Student Survey in winter/spring 2014
- » Included a set of questions on the “role of the library” in support of students’ academic success

UNC Chapel Hill Methodology

1. 1,792 undergraduate responses (10% response rate, invited all eligible students)
2. Web-based questionnaire
3. Invitation plus 2 reminders
4. Incentives provided

Pearson Correlation Matrix of Librarian-Provided Support Services Questions

| | | | | | | |
|--|-------------|-------------|-------------|-------------|-------------|-------------|
| Librarians or library staff provide assistance or guidance about coursework or research at any time of day or night (24/7) | 1.00 | | | | | |
| Librarians or library staff go into classrooms and teach about how to find sources for course-specific research papers or projects | 0.48 | 1.00 | | | | |
| Librarians or library staff provide assistance or guidance with tools used to mine or manipulate digital information | 0.51 | 0.61 | 1.00 | | | |
| Librarians or library staff provide assistance or guidance with managing data or datasets that I use for my coursework or research | 0.47 | 0.51 | 0.73 | 1.00 | | |
| Librarians or library staff provide help for learning about technology, digital, or online tools that I need for my coursework or research | 0.50 | 0.57 | 0.70 | 0.71 | 1.00 | |
| Librarians or library staff provide support in learning and using online search engines, databases, or tools | 0.49 | 0.61 | 0.64 | 0.61 | 0.76 | 1.00 |

n = 1,735

Sample: UNC Chapel Hill Undergraduates (pilot study February 2014)

Significance: $p = 0.000$ for all correlations

24/7

Go into
classrooms

Mine digital
info.

Manage data

Help to learn
about tech

Use search
engines

| Undergrad Component Matrix | Component (Factor) |
|--|--------------------|
| Librarians or library staff go into classrooms and teach about how to find sources for course-specific research papers or projects | 0.7681 |
| Librarians or library staff provide assistance or guidance with tools used to mine or manipulate digital information | 0.8721 |
| Librarians or library staff provide assistance or guidance with managing data or datasets that I use for my coursework or research | 0.8404 |
| Librarians or library staff provide help for learning about technology, digital, or online tools that I need for my coursework or research | 0.8876 |
| Librarians or library staff provide support in learning and using online search engines, databases, or tools | 0.8547 |

Eigenvalue: 3.58

Percent variance explained: 72%

Reliability (Cronbach's alpha): .90

Extraction method: principal-components factors (n = 1,737)

Item that reduces the alpha: Librarians or library staff provide assistance or guidance about coursework or research at any time of day or night (24/7)

QUESTIONS AND DISCUSSION

Heather Gendron
UNC Chapel Hill
[*hgendron@email.unc.edu*](mailto:hgendron@email.unc.edu)

Alisa Rod
Ithaka S+R
[*alisa.rod@ithaka.org*](mailto:alisa.rod@ithaka.org)