A MIXED-METHODS APPROACH TO QUESTIONNAIRE DEVELOPMENT

Understanding Students’ Interpretations of Library Survey Questions

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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
BEST PRACTICES: VALIDITY

Developing the Ithaka 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?”
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What did you think we meant when we said “historical documents”?
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
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)
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, handwritten letters or diaries, artifacts, etc.)”
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.”
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”).
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

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

_Ithaka S+R Student Survey pilot:_

» UNC Chapel Hill one of six pilot sites to field the Ithaka 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

<table>
<thead>
<tr>
<th>Question</th>
<th>24/7</th>
<th>Go into classrooms</th>
<th>Mine digital info.</th>
<th>Manage data</th>
<th>Help to learn about tech</th>
<th>Use search engines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Librarians or library staff provide assistance or guidance about coursework or research at any time of day or night (24/7)</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Librarians or library staff go into classrooms and teach about how to find sources for course-specific research papers or projects</td>
<td></td>
<td>0.48</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Librarians or library staff provide assistance or guidance with tools used to mine or manipulate digital information</td>
<td></td>
<td></td>
<td></td>
<td>0.51</td>
<td>0.61</td>
<td>1.00</td>
</tr>
<tr>
<td>Librarians or library staff provide assistance or guidance with managing data or datasets that I use for my coursework or research</td>
<td></td>
<td></td>
<td></td>
<td>0.47</td>
<td>0.51</td>
<td>0.73</td>
</tr>
<tr>
<td>Librarians or library staff provide help for learning about technology, digital, or online tools that I need for my coursework or research</td>
<td></td>
<td></td>
<td></td>
<td>0.50</td>
<td>0.57</td>
<td>0.70</td>
</tr>
<tr>
<td>Librarians or library staff provide support in learning and using online search engines, databases, or tools</td>
<td></td>
<td></td>
<td></td>
<td>0.49</td>
<td>0.61</td>
<td>0.64</td>
</tr>
</tbody>
</table>

n = 1,735
Sample: UNC Chapel Hill Undergraduates (pilot study February 2014)
Significance: p = 0.000 for all correlations
<table>
<thead>
<tr>
<th>Undergrad Component Matrix</th>
<th>Component (Factor)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Librarians or library staff go into classrooms and teach about how to find sources for course-specific research papers or projects</td>
<td>0.7681</td>
</tr>
<tr>
<td>Librarians or library staff provide assistance or guidance with tools used to mine or manipulate digital information</td>
<td>0.8721</td>
</tr>
<tr>
<td>Librarians or library staff provide assistance or guidance with managing data or datasets that I use for my coursework or research</td>
<td>0.8404</td>
</tr>
<tr>
<td>Librarians or library staff provide help for learning about technology, digital, or online tools that I need for my coursework or research</td>
<td>0.8876</td>
</tr>
<tr>
<td>Librarians or library staff provide support in learning and using online search engines, databases, or tools</td>
<td>0.8547</td>
</tr>
</tbody>
</table>

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

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