

Cognitive Testing of Survey Questionnaires



Cognitive Model of Response Processes

(Tourangeau, Rips, & Rasinski, 2000)

- Comprehension
- Retrieval
- Judgment
- Response





Comprehension

- Attend to questions and instructions
 - Lack of interest
 - Distractions (e.g., other people, noise)
- Understanding the meaning of the question
 - Complexity of language (words, phrases, sentences)
 - Use of jargon
- Determining the information requested
 - Linguistic structure of question
 - Match between question & response choices in close-ended questions



Retrieval

- Retrieval strategy – often depends on the type of question
 - Examples (e.g., extroversion)
 - Information or beliefs (e.g., attitude)
 - Retrieve stored judgment
- Retrieve specific information
 - Must be in stored in memory
 - Retrieval strategy influences which information is retrieved
 - Other factors like temporary accessibility may also influence retrieval
- Fill in missing details



Judgment

- Assess completeness & relevance of memories
 - Perhaps retrieve more information
- Draw inferences based on accessibility (& perhaps other meta-cognitive experiences)
 - e.g., ease of retrieval & extroversion
- Integrate material – may seem straightforward, but...
 - Weights assigned to various pieces of information, experiences, or beliefs (e.g., importance, certainty)
 - Combination process (e.g., adding vs. averaging)



Response

- Map judgment onto response category
 - Respondents less likely to choose responses not offered
 - Range of responses in a scale
 - Sensitivity of measure
- Edit response
 - Social desirability
 - Demand characteristics



Comprehension Problems

- Misinterpreting the intended meaning
- Confusing intended & literal meanings
- Misinterpreting response alternatives
- Literacy/vocabulary problems



Solutions to Comprehension Problems

- Ask questions one at a time
- Specify details - who, what, where, when
- Specify how answer should be given
- Use simple language
- Try to use words with only one meaning
- Pretest



Question Interpretation Pre-testing Strategies

Behavior Coding

- *Clarification (unspecified)*: R indicates uncertainty about question, but it is unclear if the problem is related to the construct or the context.
- *Clarification (construct)*: R asks for repeat or clarification of question or makes a statement indicating uncertainty about question meaning (e.g., “What do you mean by ‘depressed?’”).
- *Clarification (context)*: R indicates understanding of the meaning of the construct, but indicates uncertainty about question meaning within the context of the question as stated (e.g., “What do you want to know about being depressed?”).
- *Clarification (time frame)*: R indicates uncertainty about the question’s time frame.
- *Clarification (rewording)*: R rephrases the question before answering.



Question Interpretation Pre-testing Strategies (cont’d)

Structured probes

- Now, could you please tell me, in your own words, what you think this question is asking? [General Interpretation]
- In this question, what does the word “_____” mean to you? [Specific Word Interpretation]
- What does [selected response] mean to you? [Response Interpretation]
- Do you feel this is a question that people would or would not have difficulty understanding? [Interpretation Difficulty]
- Which of the following would you also consider to be “_____”?
- In answering this question about “_____”, did you think about?
- What kinds of things did you think about when we said “_____”? [Definition Boundaries]



Memory Retrieval Problems

- Inability to accurately recall information
- Inability to recall any information
- Search target (a) not important enough, (b) too distant, (c) too frequent
- Unwillingness to perform memory search



Solutions to Memory Retrieval Problems

- Use appropriate time frames
- Provide cues to aid memory
 - For example: “People drink beer in many places--at home, at restaurants, at bars, at sporting events, at friends’ homes, etc....During the past 30 days, did you drink any beer?”



Memory Retrieval Pre-testing

Behavioral coding

- *Qualified answer (general)*: R gives answer that meets question objective, but answer is qualified to indicate uncertainty about accuracy (includes "DK" followed by response).
- *Memory difficulty*: R gives answer but expresses concern about accuracy of memory or difficulty remembering.
- *Making inferences*: R indicates that they are estimating or guessing an answer to a specific question based on what they "usually do" or "must have done."

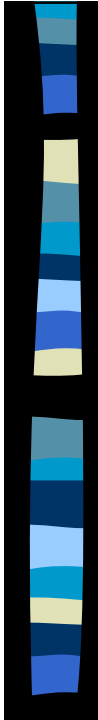


Memory Retrieval Pre-testing

(cont'd)

Structured probes

- "How did you remember the number of times you did this?" [Recall Strategy]
- "What kinds of things did you think about in answering this question?" [Recall Frame of Reference]
- "In recalling this information, did you think specifically about the most recent week, did you average together experiences you've had over a number of weeks, or did you think about it in some other way?" [Recall Interval]
- "Did you answer this question by first thinking about visits that happened most recently, about visits that happened at the beginning of the year, or by just thinking about visits in whatever order you can remember them?" [Search Strategy]



Judgment Formation Problems

- Poor accessibility (i.e., respondent has not thought much about the topic)
- Respondent is ambivalent or has difficulty making a general judgment
- Differential anchoring (i.e., respondent basing judgments on different standards)



Solutions to Judgment Formation Problems

- Including question in a series asking about related issues (increases accessibility)
- Greater specificity of questions (less general) or measuring ambivalence
- Create anchors
 - For example, first ask judgment relative to others; then ask about their own opinion.



Judgment Formation Pre-testing

Behavior coding

- Less clear
- Perhaps if R says “it depends” or asks for examples to help anchor response scale

Structured probes

- “How did you arrive at this answer?”
- “Why do you believe this?” [Judgment Explanation]
- “How sure are you of your answer to this question?” [Judgment Certainty]
- “Did you compare yourself to other people or to how your health used to be in deciding how to answer this question?” [Anchoring Strategy]
- “Is this something you had already made up your mind about before we asked this question?” [Attitude Crystallization]



Response Mapping Problems

- Different interpretations of response options
- Difficult to come up with a precise response
- No appropriate response option
- Difficulty remembering response format



Response Mapping Solutions

- Use widely understood modifiers in response options
- Interviewers trained to probe imprecise response options or those that don't use correct response format
- Use verbal labels
- Use moderate number of response options (5-7)
- Use evenly spaced response options
- Show cards or repeat response options



Response Mapping Pre-testing

Cognitive interviews

- *Clarification (response format)*: R indicates uncertainty about the format for responding.
- *Inadequate answer (general)*: R gives answer that does not meet question objective.
- *Imprecise response (general)*: R gives answer that only partially meets question objective (e.g., "well over 10 times," "at least twice").
- *Imprecise response (different response option)*: R gives answer that does not use response options provided with the question (e.g., "not so good health" instead of excellent, very good, good, fair or poor).
- *Imprecise response (range)*: R answers question with a range rather than a single number.



Response Mapping Pre-testing

Structured probes

- “What does [response option] mean to you?” [consensus of meaning of response options]
- Question: “Would you say your health is excellent, very good, good, fair or poor?”
 - Follow-ups: “On a scale of 0 to 10 with 0 being the worst possible health and 10 being the best possible health, what number best represents [excellent, very good, good, fair, poor] to you?”



Response Editing Problems

- Social desirability & self presentation
- Effects of respondent-interviewer social distance (rapport)
- Concerns about anonymity/privacy of responses



Solutions to Response Editing Problems

- Train interviewers to maintain professional attitude
- Use comparative (forced) choice instead of yes/no formats
- Avoid loaded (socially desirable) questions
- Make response process anonymous
- Use open questions for sensitive issues (i.e., don't offer categories)
- Or, use categories to lessen the problem (e.g., categorize up to very high levels of drinking)
- Use longer questions to reduce sensitivity (e.g., "While we know that exercise is good for your health, it is often hard to find the time to do so. How often are you able to exercise?")



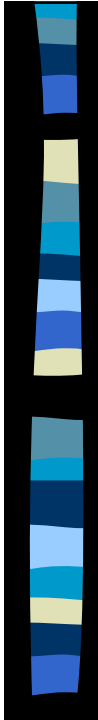
Response Editing Pre-testing

Behavior coding

- Less clear
- People express discomfort explicitly
- Refusals?

Structure probes

- "In general, do you feel that people might purposely say they '_____' more than they do, less than they do, or would they try to answer accurately?" [*Perceived Social Desirability*]
- "In general, do you feel that people would or would not be embarrassed to answer questions about '_____'"?
- "Do you feel that this is a question that people would or would not be embarrassed to answer to a survey interviewer of the same/opposite sex?" [*Perceived Embarrassment*]



Experiments

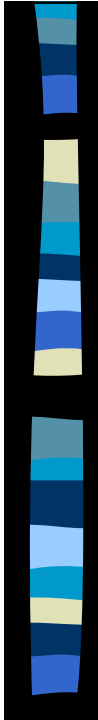
(sometimes referred to as split ballot designs)

- Pre-testing is often used to identify problem questions or sequences in surveys
- Experiments used to compare 2 (or more) versions of questionnaire (or study designs) & determine which provides the highest quality data
 - Influence of question wording, mode, interviewer characteristics on distribution of responses or response accuracy



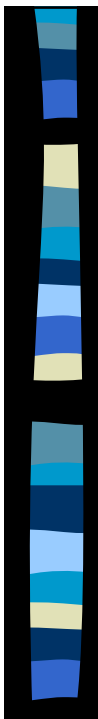
Assessing Data Quality

- Reliability
 - Multi-item scales
 - Test-retest
- Validity
 - Accuracy relative to some known standard
 - Predictive validity (theoretically predicted relationships)



Satisficing

- Evidence thus far has assumed that if we wrote the perfect question, Rs would go through the steps of answering questions carefully & answer questions accurately...
- Theories like satisficing take respondents' motivation & ability into account...



Satisficing

- A theoretical model of how thoroughly respondents go through the cognitive steps
- Satisficing vs. optimizing
- Optimizing takes a nontrivial amount of cognitive effort
- When Rs are not motivated or able to carefully go through all the steps, they may satisfice or provide a satisfactory answer instead.
- Rs may look for an easy strategy or cue to pick “satisfactory” answer.



What influences the extent to which people satisfice?

- Respondent ability
 - Cognitive skills
 - Familiarity with the topic
 - Pre-existing stored judgment
- Respondent motivation
 - Individual differences
 - Interest or caring about the topic
 - Perceived importance of the survey
 - Perceived accountability
 - Fatigue or boredom – interview length
- Task difficulty
 - Each of the four cognitive steps may be difficult
 - Influenced by question wording and language



Strategies for Satisficing

- Picking the first reasonable response (response order effects)
- Agreeing with assertions
- Endorsing the status quo
- Nondifferentiation
- Saying “don’t know”
- Mental coin-flipping



Example: Response Order Effects

- Only affect close-ended questions
- **Primacy:** when response options near the beginning of a list are chosen more frequently than those at the end
- **Recency:** when response options near the end of a list are chosen more frequently than those at the beginning



The Real-World Impact of Response Order Effects

- On Feb. 8, a Superior Court judge in California removed Compton's sitting mayor and replaced him with the previous incumbent, who had seemingly lost in a very close election last June.
- The judge's decision rested heavily on court testimony about the "primacy effect" in elections: how a candidate attracts more votes simply by having his name listed first on the ballot.
- In the Compton mayor's race, the challenger's name was illegally placed first on the ballot.
- Challenger Eric Perrodin received at least 306 votes - and probably more - based purely on the fact his name was illegally listed first. Perrodin beat incumbent Omar Bradley by 281 votes.



Implications for Questionnaire Design

- Use pre-testing to understand cognitive processes & determine potential problems
- Use cognitively appropriate time periods when asking about past behavior
- Be specific & unambiguous in wording of questions
- Minimize respondent cognitive burden
- Understand effects of response categories...use to control response editing
- Avoid cues that Rs can use for satisficing (no opinion response options; agree-disagree questions)
- Estimate & control for response effects when they cannot be avoided



Take Home Points

- Put yourself in the respondent's position
- Think about implications of question wording
- Data is better than no data
- Consider
 - Motivation
 - Ability
 - Task difficulty
 - Privacy/anonymity concerns (sensitive questions)
 - All aspects of cognitive processes