

Annotated Bibliography

Using Cognitive Interviews to Pretest Structured Surveys in Health Disparities and Minority Aging Research

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Cognitive interviews are used widely during the pretesting phase of questionnaires to detect items that are not understood by respondents as intended by the developers. Cognitive interview methods reflect a theoretical model of the survey response process involving four stages: comprehension or interpretation, information retrieval, judgment formation, and response editing. In other words, the respondent must understand the question, recall the information, decide upon the relevance of what they recall, and formulate an answer in the format provided by the interviewer that they are comfortable reporting. Cognitive interviews thus help us understand how respondents interpret and answer questions.

In studies of health disparities, cognitive interviewing can help assess the conceptual adequacy of new or adapted self-report measures across groups varying in socioeconomic status or race/ethnicity. Results can be used to revise items or develop new ones to be appropriate to respondents' cultural context. Cognitive interview methods rely primarily on specific probes about how respondents interpret questions and strategies they use to recall the information. Such probes are usually scripted in advance.

Behavioral coding is another approach to identifying problems with items by reviewing transcripts of interviewer-administered surveys, regardless of whether probes are used. Below we identify several key articles, books and book chapters that illustrate the use of these methods for pre-testing surveys. We indicate which ones utilize behavioral coding.

Berrigan D, Barb Forsyth BH, Cynthia Helba C, Kerry Levin K, Alicia Norberg A, Gordon B Willis, GB. Cognitive testing of physical activity and acculturation questions in recent and long-term Latino immigrants. *BMC Public Health*. 2010; 10: 481. [PMCID:PMC2927546](#)

The authors describe cognitive interviews of survey items on acculturation and physical activity for Spanish- and English-speaking Latinos. The article provides a good overview of the rationale for querying about cultural differences in these topics, how cognitive interview probes were developed, examples of questions, and results. Qualitative findings are presented, and the prevalence of various types of problems shown. Quantitative summaries of findings are presented and a section on practical implications for question design is useful.

Carbone ET, Campbell MK, Honess-Morreale L. Use of cognitive interview techniques in the development of nutrition surveys and interactive nutrition messages for low-income populations. *Journal of the American Dietetic Association*. 2002; 102(5):690-696. [PMID:12008995](#)

This article describes the use of cognitive interviews to assess comprehension of nutrition survey items and nutrition intervention messages in low-income families in North Carolina. The sample included technical community college students; half were African American. The cognitive interviews identified problems with unclear instructions, confusing terms and response options, variations in interpretations of terms, and misinterpretation of dietary recommendations. Results were used to clarify ambiguous instructions and terms, expand response options, and more clearly specify dietary recommendations to make the survey and intervention messages more suitable for use in low-income groups.

Harris-Kojetin LD, Fowler FJ Jr., Brown JA, Schnaier JA, Sweeney SF. The use of cognitive testing to develop and evaluate CAHPS 1.0 core survey items. Consumer Assessment of Health Plans Study. *Medical Care*. 1999; 37 (3 Suppl):MS10-21. [PMID:10098555](#).

The authors performed 150 cognitive interviews to facilitate development of the CAHPS core survey questionnaire to obtain information on the experiences of health plan enrollees. The sample included low literacy adults, adults with chronic conditions, and Medicare recipients. The authors describe the process of conducting cognitive interviews and its role in survey development. Results pertain to: 1) using ratings versus reports when asking respondents to assess their experience; 2) the length of the reference time specific to the questions; and 3) ensuring respondents utilize the 'not applicable' response when appropriate in self-report surveys.

Johnson TP, Cho YI, Holbrook AL, O'Rourke DO, Warnecke RB, Chavez N. Cultural variability in the effects of question design features on respondent comprehension of health surveys. *Annals of Epidemiology*. 2006;16:661-668. [PMID:16473526](#).

The authors performed behavioral coding of 345 interviews with African American, Mexican American, Puerto Rican, and non-Latino White adults to identify question characteristics that might account for cultural variability in responses. Behavior coding involved the systematic coding of respondent and interviewer behaviors using a pre-determined coding scheme to identify problems with survey questions. The interview included standard questions from national surveys, e.g., the National Health Interview Survey and the Behavioral Risk Factor and Surveillance Survey.

- NOTE: Includes behavioral coding

Kwan CM, Napoles AM, Chou J, Seligman HK. Development of a conceptually equivalent Chinese-language translation of the US Household Food Security Survey Module for Chinese immigrants to the USA. *Public Health Nutrition*. 2015 Feb;18(2):242-50. [PMCID:PMC4169349](#)

This study highlights methodological challenges in developing survey instruments designed to compare language groups, and describes development of a Chinese translation of the US Household Food Security Survey Module. The authors conducted cognitive interviews with 22 community members from community sites hosting food pantries and 5 professionals from clinical settings. The methods provide examples of cognitive interview questions and probes. The results provide examples of the types of information obtained that was used to improve the translation. For example, there were issues related to dialect, education, literacy (e.g. preferences for more or less formal phrasing), English words and phrases for which there is no Chinese language equivalent (e.g. 'balanced meals' and 'eat less than you felt you should'), and response formats. The investigators report the final translations to maximize consistency of the Chinese translation with the intent of the English version, clarity; and similarities in understanding across dialects and literacy levels. Cognitive interview methods can thus be used for survey translation when non-equivalence is suspected, such as in surveys addressing highly culturally bound behaviours (diet and eating).

Mullin PA, Lohr KN, Bresnahan BW, McNulty P. Applying cognitive design principles to formatting HRQOL instruments. *Qual Life Res.* 2000 Feb;9(1):13-27. doi: 10.1023/a:1008923301313. [PMID:10981203](#)

This paper reviews the cognitive processes by which respondents answer health-related quality of life (HRQOL) questions and demonstrates how 'cognitive aspects of survey methodology' research can improve data collection. Three objectives for formatting self-administered questionnaires are: 1) to reduce errors in respondent navigation through the questionnaire that lead to item non-response and question misinterpretation; 2) to reduce respondent and administrative burden; and 3) to enhance respondent motivation in question answering and compliance with the request to participate. The authors present guidelines for formatting HRQOL instruments that include six attributes: simple, consistent, organized, natural, clear and attractive.

Nápoles-Springer AM, Santoyo-Olsson J, O'Brien H, Stewart AL. Using cognitive interviews to develop surveys in diverse populations. *Medical Care*, 2006;44(Suppl 3):S21-S30. [PMID:17060830](#)

This article illustrates the importance of cognitive testing in assessing the conceptual adequacy of new or adapted self-report measures across ethnic groups in studies of health disparities. The authors demonstrate use of complementary cognitive testing techniques, interaction analysis and behavior coding, to evaluate a survey administered to an ethnically diverse population. Forty-eight cognitive interviews were completed, including African Americans, Latinos (English and Spanish), and Whites. Results permitted identification of general and ethnic group specific problems with wording and concepts, revealed the nature of the problems, and enabled decisions to modify or drop items based on respondents' comments.

- NOTE: Includes behavioral coding

Paz SH, Jones L, Calderón JL, Hays RD. Readability and Comprehension of the Geriatric Depression Scale and PROMIS® Physical Function Items in Older African Americans and Latinos. *Patient.* 2017 Feb;10(1):117-131. [PMCID:PMC5260858](#)

This study used cognitive interview methods to estimate the comprehensibility of two widely-used measures of physical functioning in African American and Latino older adults. Results illustrate the types of problems respondents had with these standard questions including confusing item wording and response choices.

Presser S, Couper MP, Lessler JT, Martin E, Martin J, Rothgeb JM, Singer E. Methods for testing and evaluating survey questions. *Public Opinion Quarterly.* 2004;68(1):109-130. <https://doi.org/10.1093/poq/nfh008>

The authors provide a detailed review of cognitive pretesting including its history and development, supplemental techniques, experiments to test the usefulness of revisions made to surveys based on cognitive interview results, statistical modeling and different modes of data collection. The authors argue that the methods used to conduct cognitive interviewing influence the results, and conclude that developing optimal cognitive interviewing techniques is imperative. Directions for future research are explored in depth.

Ramirez M, Teresi JA, Ogedegbe G, Williams O. Using qualitative methods to assess the conceptual equivalence of the Spanish and English Stroke Action Test (STAT). *Qualitative Health Research*. 2016 Nov;26(13):1812-1822. doi: 10.1177/1049732316636362. Epub 2016 Jul 10. [PMID:27055498](#)

The STAT is a self-report measure used for predicting the actions of lay people in response to stroke symptoms. The authors describe the use of cognitive interviewing techniques to develop a Spanish STAT and to examine the clarity, comprehension, and cultural relevance of both the Spanish version and the revised English STAT among Black and Latino respondents. This article demonstrates the importance of addressing the conceptual adequacy of adapted or translated measures when used among diverse groups. Cognitive interviews and probing techniques helped identify problematic items, highlighted potential errors in answering questions, and provided insight into item interpretation. Examination of the content of the interview resulting from the item responses from the scripted as well as open-ended cognitive probes revealed various potential sources of response error, associated with cultural background, language mastery, and/or education level. Inconsistencies in item interpretation across the two language versions were attributable to both socio-cultural differences and translation issues.

Rosal MC, Carbone ET, Goins KV. Use of cognitive interviewing to adapt measurement instruments for low-literate Hispanics. *The Diabetes Educator*. 2003;29(6);1006-1017. [PMID:14692374](#)

This article describes the use of cognitive interviewing to adapt measures for use in populations for whom they were not originally developed. Cognitive interviewing was used to adapt four instruments (the Audit of Diabetes Knowledge, the Insulin Management Diabetes Self-Efficacy Scale, and the Center for Epidemiological Studies-Depression Scale) for use with low-literate, Caribbean Spanish-speaking older adults with diabetes. Participants included Puerto Rican and Dominican adults aged 57-80 years; all had 5 years or less of schooling. Adaptations included developing interviewer administered versions of the instruments, translation into Spanish where necessary, modification of negatively worded items, and deletion of items not culturally relevant. Probes addressed the suitability of specific words used in items, the clarity of response options, and suggestions for alternate wording. Results of content analysis of the interviews were used to modify instructions and specific survey items for improved comprehension.

Solorio R, Ayala NC, Paez E, Skalicky AM, Morales LS. Use of cognitive interviews to adapt PROMIS measurement items for Spanish-speakers living with HIV. *AIDS Research and Treatment*. Published online 2016 Feb 28. [PMCID:PMC4789049](#)

This article describes the use of cognitive interviewing to assess comprehension of existing Patient-Reported Outcomes Measurement Information System (PROMIS) items among Spanish-speaking Latinos living with HIV and refinement of items based on participant feedback. Problems with comprehension related mainly to the complexity of the words used. Cognitive interviews allowed for the identification of language that was easier to comprehend and identified the need for the inclusion of explanatory phrases to enhance item comprehension. Next steps will involve the use of quantitative methods to ensure measurement equivalence between the Spanish and English versions of the PROMIS item banks after collection of a large number of completed PROMIS items in Spanish and English.

Warnecke RB, Johnson TP, Chavez N, Sudman S, O'Rourke DP, Lacey L, Horm J. Improving question wording in surveys of culturally diverse populations. *Annals of Epidemiology*. 1997;7(5)334-42. [PMID:9250628](#)

The article reviews the theory of survey response and how differences in race/ethnicity lead to systematic measurement error in survey responses to standardized questionnaires. The authors performed cognitive testing on questions from several well established national health surveys in an ethnically diverse sample. The purposive sample of 423 adults included equal numbers of African Americans, Puerto Ricans, Mexican Americans, and non-Hispanic whites. They evaluated how race and ethnicity influenced respondents' performance of the four cognitive tasks involved in responding to survey questions: question interpretation, information retrieval, judgment formation, and editing. Differences were found by race/ethnicity for several of the stages of question response, suggesting that more work is needed to develop surveys that are valid across racial and ethnic groups.

Willis GB and Artino AR, Jr. What Do Our Respondents Think We're Asking? Using Cognitive Interviewing to Improve Medical Education Surveys. *The Journal of Graduate Medical Education*. 2013 Sep; 5(3): 353–356. [PMCID:PMC3771159](#)

This excellent 4-page editorial provides a brief overview of the field of cognitive interviewing. Dr. Willis is one of the first to develop and apply this method. It provides examples of the types of probes that can be used, the process of cognitive interviewing, types of probes, and how to analyze results.