SURVEY PROCEDURES FOR CONDUCTING COGNITIVE INTERVIEWS TO PRETEST QUESTIONNAIRES: A REVIEW OF THEORY AND PRACTICE

Johnny Blair and Stanley Presser
Survey Research Center
University of Maryland

"...almost every field develops toward the area where a few simple ideas provide a lot of things to do."

Chomsky (1988: 92)

After many years of relative neglect, the pretest phase of survey design has become the focus of considerable methodological activity. Applications of cognitive psychology to survey design have helped both to increase interest in pretesting, and to provide methods for its study. The Advanced Research Seminar on Cognitive Aspects of Survey Methodology (Jabine et al., 1984) and the developments it spawned highlighted the potential value of cognitive theory and methods for understanding many aspects of the survey response process (Royston et al., 1986; Willis et al., 1989). Questionnaire testing seemed particularly well suited to take advantage of this movement. Pretesting focuses on issues of respondent understanding of questions (and how these understandings differ from those the researcher intends) and the problems respondents encounter doing the tasks posed by questions. A set of methods that give insights into information processing seems directly applicable to these objectives.

Cognitive psychology may provide a fruitful approach to understanding -- and possibly improving -- performance in each of the various stages of the response process described by Cannell et al., (1981), Tourangeau and Rasinski (1988), Willis et al., (1989) and others: comprehension, retrieval, response formation, and response reporting. By revealing what information respondents use in responding to questions, cognitive methods hold promise of illuminating how respondents comprehend questions and how answers are arrived at and reported.

While there is a wide array of "cognitive" methods that can be used in instrument development, including paraphrasing and free and dimensional sort tasks (Forsyth and Lessler, 1991), much of the methodology is based on verbal reports of respondents' thoughts while answering survey questions in a laboratory setting. In particular, think aloud (TA) protocols and immediate retrospective reports which Ericsson and Simon (1993) feel "reflect... cognitive processes in the most direct way" seem to have received the widest attention.

There have been two sources of skepticism about the application of these methods to survey research. Some have asked whether the methods differ from more conventional approaches to determining reactions to survey items. Others have questioned whether respondents can report accurately about their cognitive processing of survey items.

On their face, the descriptions of cognitive interviewing, especially retrospective think aloud protocols and probing, are often similar to methods used by earlier researchers (e.g., Belson, 1981) to determine comprehension and other response difficulties (Presser, 1989). If cognitive methods differ from the earlier approaches, their distinctiveness would seem to rest on two bases: they provide access to actual cognitive processes and they provide models for interpreting reports about those processes.

Cognitive psychology offers both models and theory about information processing that are applicable to many of the tasks survey respondents are asked to perform. This is

particularly true in the area of autobiographical memory (Bradburn et al., 1987). Several researchers (e.g Sirken et al., 1987) have emphasized the importance of a theoretical framework for interpreting the TA protocols. Although we suspect that the elicitation of verbal reports and their analysis is often not theory driven, relevant theory is available.

There is, however, limited consensus on whether people can report accurately about their actual cognitive processes. On the basis of a number of studies, Nisbett and Wilson (1977) conclude that they often cannot. By contrast, Ericsson and Simon (1993) argue that both concurrent and retrospective verbal reports can provide information on certain types of information processing, and that such reporting does not affect the nature of cognitive processes, though it may affect their speed.

The TA method was developed by cognitive scientists to study human problem solving in the context of complex tasks such as playing chess. Fred Conrad (personal communication, 1991) notes important ways the original use of TA protocols differs from the use made by survey methodologists:

> First, the methods were developed by psychologists for a quite different purpose, namely to extract the knowledge and strategies used when solving complex problems that subjects have at least some access to through introspection. Second, in most cases, comprehension is presupposed... This differs from the [survey] use of think aloud methods in that first, the problems respondents are solving are relatively simple, and often solved fairly automatically.... Much of the verbal reporting by respondents in the survey application is retrospective and due to interviewer probing. The risk of distorting the report increases under these circumstances. Second, many of the issues in the survey application involve comprehension. The trouble with this is that it is difficult to use language to describe concurrent comprehension. Again, this encourages much of the reporting to be done retrospectively.

In discussing think aloud protocols, Ericsson and Simon emphasize the importance of the particular techniques used to elicit them. Much of their response to Nisbett and Wilson focuses on the procedures used in studies cited as evidence of the unreliability of verbal reports (Ericsson and Simon, 1993: 25-30). They caution that great care must be taken in giving instructions to respondents prior to eliciting TA protocols, as well as during the conduct of the TA interviews.

Ericsson and Simon (1980, 1993) are the most cited source for the TA method among survey researchers. Given the stress they place on the techniques used to conduct think-alouds, one might expect that the nature of these procedures would therefore have received considerable attention from survey researchers. With a very small number of exceptions, however, the literature we have been able to locate (listed in the References) contains no detail about how think-alouds are actually carried out. Not much is known about what respondents are asked to do in cognitive interviews. The same is true for almost everything else associated with the use of these techniques in survey research, including: how frequently they are used and under what circumstances; the kind of staff employed to conduct them and the training they receive; and the number of interviews conducted and whether they are taped and formally analysed.

Data Collection

In order to explore the nature and role of cognitive methods in questionnaire development, we carried out a mail survey of academic survey research organizations and federal statistical agencies in the spring and summer of 1993. The respondent was the person who knew "the most about how questionnaires are developed and tested at [the] organization." The sampling frame for the academic organizations was "The List of Academic Survey Research Organizations" in the Summer-Fall 1992 issue of the "Survey Research" newsletter published by the University of Illinois Survey Research Laboratory. It contained the names and addresses of 74 organizations. Three federal

statistical agencies were also selected because we knew they conducted cognitive interviews. All the selected federal agencies and 93 percent of the academic organizations responded. (The answers to the first item in the questionnaire indicated that one of the academic organizations does not develop or test questionnaires. It was skipped out of all remaining questions and is therefore not included in our analysis.)

Academic Results

Of the 68 academic organizations that develop or test questionnaires, only a third report ever having used cognitive interviewing techniques such as concurrent or retrospective think aloud protocols. About half of the organizations that have used these techniques report first doing so before 1988, and about half since.

The organizations that had never used cognitive techniques were asked why that was the case. The reasons are almost equally divided between lack of client support or interest, lack of knowledge of the techniques, and lack of resources. Only two organizations said that the methods were not used because they did not seem worthwhile.

Of the 23 organizations that ever used the techniques, 21 report currently using them to some extent (one respondent failed to answer the item). One uses them in all questionnaire development, about 80 percent for "a few" or "some" questionnaires, and 2 organizations for "most" questionnaires.

In response to an item about the number of different surveys for which the techniques have been used, the responses ranged from 2 to 40, with a median of 8.

The number of cognitive interviews conducted in the development or testing of questionnaires also varies across organizations. The median for the smallest number ever conducted is 6, and for the largest number ever conducted it is 31.

Almost all organizations conducting cognitive interviews report using several interviewers

rather than a single one, with the range of 2 (the mode) to 7 accounting for nearly 90 percent of the responses.

Who Does The Interviews?

Almost two-thirds of the organizations use a combination of regular survey interviewers and other staff to conduct cognitive interviews. Of the organizations that described the nature of this "other" staff, only 4 of 18 mention psychologists. Most often the "other" staff are described as supervisors, professional staff, and research assistants.

Three organizations use only regular survey interviewers and 6 never use such interviewers. The reasons given for not using survey interviewers are either that they do not have the appropriate skills, or that the design staff prefers to get direct feedback.

About half the organizations tape cognitive interviews. One organization never has someone other than the interviewer review the tapes, 2 always have such review, and the remaining organizations split about one-third/two-thirds between "most" or "some" of the time.

Only about a third of the organizations provide formal training in the conduct of cognitive interviews. The amount of training ranges from 1 hour to three days, with a day or more accounting for about three-quarters of the cases. Only 2 organizations always have training done by someone with a graduate degree in psychology. Formal training aside, fewer than one-quarter of the organizations have written guidelines for the conduct of cognitive interviewing.

When Is Cognitive Interviewing Used?

Organizations mention using a variety of criteria -- from the resources available and client requests to characteristics of the questionnaire -- to decide when to use cognitive interviews. Nine of the 19 organizations answering this question mention resources as a factor, while about equal numbers mention semantic (6) or task (5) concerns in the questionnaire. Only 2

mention client requests.

While it is unclear how these various factors are weighted, instrument complexity or "newness" are mentioned in about half the responses. These comments are often accompanied by expressions of uncertainty about how well respondents will be able to understand the instrument or provide the requested information. This practice is contrary to at least some counsel (e.g., Royston 1989) that suggests all questionnaires can benefit from the use of the procedures.

What Are Respondents Asked To Do?

The motivations for choosing cognitive techniques for instrument development are reflected in what respondents are asked to do in the interviews. Four of the 6 organizations that mention concerns about meaning or respondent tasks as a factor in the decision to use cognitive interviewing, directly ask respondents to report about what questions or terms mean to them, or to comment on what they think is the intent of items.

Of the 21 organizations in total that described what respondents are asked to do in cognitive interviews, only 5 mention using either concurrent or retrospective TA methods, but one of these indicated that it seldom uses TAs. The emphasis at most organizations is to obtain direct reports from respondents about such things as how they understood particular questions or words (mentioned by 9 organizations), or to ask directly about other respondent problems (mentioned by 8). Interviewer probing is the most frequently mentioned method of eliciting this information. Other methods -- such as paraphrasing, dimensional or free sorts, or confidence ratings -- are rarely mentioned.

Government Results

Among the 3 federal organizations the number of cognitive interviews done on a study ranges from 5 to 60, and regular survey interviewers are not used to conduct them. Such interviews are always taped, though the tapes are reviewed by others only on "some" or "a few" studies.

One agency has formal training (of about 40 hours). The trainer does not always have a graduate degree in psychology. Two of the agencies have written guidelines.

Whether cognitive interviewing is used on a particular study depends on the research questions at issue, sponsor interest, and the available resources. One agency felt that "...relative to other pretesting methods, cognitive interviews can be time consuming and costly."

All three agencies used TA to some extent, though one agency considers TA secondary to pre-planned or spontaneous probes. All three agencies appear to combine TA procedures with other probing. The probing takes place both during the interview and afterward. It is not clear how much typically occurs in which phase of the interview.

Conclusions

Only a minority of academic survey organizations have ever used cognitive interviewing in questionnaire development or testing.[1] Among those organizations that have used the technique, most provide no formal training in this kind of interviewing; even fewer have written guidelines for how such interviews are to be conducted. Interviews are taped in only about half of the organizations, and tapes that are made are not routinely reviewed by someone other than the interviewer. Most uses of the method emphasize direct probing to diagnose problems. Taken together, these results suggest that little information processing theory is used in survey research applications of cognitive interviewing, and that the interviews themselves are not being carried out in accordance with the recommendations of the cognitive scientists who developed them.

While the methods most widely used are seldom theory-driven, and employ procedures at variance with those recommended by cognitive theorists, they may nonetheless provide useful information about questionnaires. Of course, in the absence of experimental comparisons, it is

hard to know how much of this information stems from the attention and resources being devoted to questionnaire development, as opposed to features of cognitive interviewing per se. Even without experimental comparisons, clues about the effectiveness of alternative procedures might be forthcoming if there were greater reporting in survey research about exactly how cognitive methods as well as other forms of testing are conducted.

To take fuller advantage of the cognitive method, more genuine collaboration between survey researchers and cognitive psychologists seems necessary. Indeed it may well be the lack of opportunities for such collaboration at most survey organizations that has lead to the mutation of TAs into more conventional conversations with respondents.

Notes

Dana Wagner and David Rohall supervised the extensive followup of the mail survey and the coding of the data, and Theresa DeMaio and Roger Tourangeau provided comments on the draft questionnaire.

1. If any respondents either misunderstood what we meant by cognitive interviews or felt pressured to answer in a socially desirable way, the true value is even lower than we report.

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