

# DESIGN-ORIENTED FOCUS GROUPS AND COGNITIVE LABORATORIES: A COMPARISON

Donna L. Eisenhower, Ph.D., Mathematica Policy Research, Inc.  
Donna L. Eisenhower, MPR, Box 2393, Princeton, NJ 08540

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This paper compares the use of design-oriented focus groups and cognitive laboratories for the purpose of assessing questionnaires. Both techniques are often utilized to evaluate dimensions of questionnaire design, such as respondent comprehension, motivation, recall bias, questionnaire flow, and the questionnaire format itself. They can also explore other survey-related topics, such as the conditions under which respondents are willing to participate in a survey, review advance or cover letters associated with the survey, and indicate respondents' preference of survey mode, tolerance for survey length, and reactions to a variety of incentives to participate. However, the dynamics of the focus groups and concentrated focus of the laboratories themselves lead to diagnosis of different dimensions of respondent problems.

This paper discusses the mutual and exclusive use of each technique in survey research. Specific experience with design-oriented groups and laboratories is cited to support key points.

## Description of the Cognitive Laboratory Method

The cognitive laboratory method is an in-depth approach to assessing response problems via questionnaires that uses an array of cognitive techniques administered on a one-to-one basis. Using cognitive psychology as a theoretical framework, the questions focus on how respondents process cognitive information and examine how perception, language, comprehension, memory, and thinking or problem solving affect ability to recall and report accurate information. A questionnaire is administered prior to the laboratory. A cognitive researcher then uses a variety of techniques with individual respondents to assess potential questionnaire problems.

An array of techniques that can be used in a cognitive laboratory include concurrent and retrospective think-aloud interviews; confidence

ratings; paraphrasing; free and dimensional sorts; response latency measures; structured probes; and memory cues. These techniques have been pioneered by the NCHS, National Laboratory for Collaborative Research in Cognition and Survey Measurement and are defined in the Jobe and Mingay article in the *Journal of Public Health*, 1989. The use of cognitive laboratories as a method to reduce response error in surveys was pioneered by the Questionnaire Design Research Laboratory (QDRL) of the National Center for Health Statistics (NCHS), under a grant from the National Science Foundation (NSF) (Jobe and Mingay 1989). Subsequently, laboratories were established at the U.S. Bureau of the Census and the Bureau of Labor Statistics (BLS).

## Description of the Design-Oriented Focus Group

Unlike a laboratory, with its individual in-depth approach, a focus group is conducted within the dynamic context of a group. The disadvantage of this context is that dominant members can suppress more subdued participants. However, responses that might not emerge in an individual interview often do so during interaction of focus group members.

Focused group discussions provide a flexible tool for exploring respondent awareness, behavior, concerns, beliefs, experience, motivation, and plans as related to particular topics or issues. A design-oriented focused discussion explores topics in advance of questionnaire development or assesses the adequacy of developed questionnaires. Most of the cognitive techniques can also be applied to the group context. However, selectivity is more important, given the time constraints imposed by the need for more than one person to react to each issue.

The focus group is a small discussion group of 8 to 10 people, led by an experienced moderator who is skilled at eliciting a full discussion of the issues. The moderator guides the discussion in order to identify points of consensus, as well as differing views and reasons behind such differences. Focus groups provide qualitative feedback, as opposed to the statistical results obtained from probability-based surveys. Focus group results are not statistically

representative, but different kinds of groups can be designed to represent key groups in the universe. The moderator uses a topic guide, which lists issues or areas of inquiry.

### **Background on Case Examples**

Case examples will be used to illustrate points made about the mutual and/or exclusive uses of cognitive laboratories and design-oriented focus groups. (The author was director of the cognitive laboratory and focus group efforts cited in the examples.) Background information for three sets of cited examples is now presented.

**Example 1** - The U.S. Fish and Wildlife Service has sponsored National Surveys of Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR) at five-year intervals since 1955. The FHWAR surveys are used to estimate the number of participants in various wildlife-related activities, primarily hunting and fishing, the number of days spent on those activities, and a wide range of associated expenditures. Since inception, these surveys have used a one-year recall period in which respondents are asked about details of their wildlife-related activities during the entire preceding calendar year. After the 1985 survey, conducted by the Census Bureau, several interest groups questioned the accuracy of FHWAR estimates because of the length of the recall period.

Subsequently, Westat was hired as contractor to conduct a field experiment and cognitive testing of the questionnaires. A large field experiment permitted a detailed comparison of estimates under recall periods of one year, six months, three months, one month, and two weeks. Three sets of focus groups and cognitive laboratories were also conducted. Participants for the laboratories and focus groups were recruited from Maryland, northern Virginia, and the District of Columbia. Eighty anglers and hunters responded and 30 were selected, representing a broad mix demographically and by avidity of activity.

Those assigned to the first focus group were asked to participate in cognitive laboratories the day before. For the second group of participants, the questionnaire was administered in the usual manner immediately before the focus group. The third group completed a self-administered version of the questionnaire prior to attending the focus group. The annual version of the FHWAR questionnaire was tested. Much of the questionnaire required

responding to behavioral frequency questions (for example, number of trips for x, y, and z days per trip; detailed costs per trip). The overwhelming finding was that the methodology involving scheduling participants to attend a cognitive laboratory and then a focus group the following day produced the most informed participants and the fullest range of thoughts and comments on the questionnaire and design options. (Chu, Eisenhower et al. 1989, p. 3-2.)

**Example 2** - The National Science Foundation has sponsored three surveys as part of the Scientists and Engineers Statistical Data System (SESTAT): the National Survey of College Graduates, the Survey of Doctorate Recipients, and the Survey of Recent College Graduates. The primary goal of the surveys is to provide data on the number and characteristics of persons in the U.S. labor force who hold degrees in science and engineering or are employed in these fields. The flow of individuals between occupations over time is also of interest.

The sample size for the combined surveys exceeded 300,000 individuals. On the basis of several appointed-committee reports, revisions of the survey methodology and questionnaire were recommended. Mathematica Policy Research, Inc., (MPR) was awarded a technical assistance contract in 1991 to assist with the methodological evaluation and revisions. As part of this effort, 4 cognitive laboratories and 11 focus groups were conducted between October 1991 and September 1993 to assess the questionnaire and related cover materials. The focus groups and laboratories were conducted in the Washington, DC, metropolitan area, Philadelphia, Baltimore, and Princeton, New Jersey.

The cognitive laboratories were conducted first to provide a basis for developing hypotheses and a topic guide for the focus groups. The focus groups were conducted iteratively in a continuous process of revising the questionnaire, testing the results, revising, and testing again. The nature of the SESTAT questionnaire is quite different from the behavioral frequency information sought by the FHWAR questionnaire. The SESTAT questionnaire emphasizes the classification of occupation and education under various conditions and at several fairly recent points in time. It assesses employment status and work-related activities, and involves few behavioral frequency questions or recall issues. However, accurately capturing a particular person's history within the existing answer categories or classification systems is more of an issue.

**Example 3** - The third set of examples emerged from a study to assess the feasibility of conducting a national survey with Medicaid beneficiaries. The

study was funded by the Physician Payment Review Commission (PPRC), with MPR as the contractor. As part of the feasibility study, a questionnaire on respondents' eligibility, health status, health utilization, and access was developed. The questions, largely taken from existing national surveys such as NHIS and NMES, ranged from those dealing with behavioral frequency to attitude and opinion. To assess the questionnaire, both "informal" cognitive laboratories and a focus group were conducted at a Medicaid office in Trenton, New Jersey.

The participants were largely Aid to Families with Dependent Children (AFDC) mothers between the ages of 21 and 33 years with varied "usual" places of health care and family circumstances. All had limited education, one had been homeless, and one had been recently incarcerated. In this instance, the laboratories allowed for more assistance and probing of questionnaire items than did the focus group, in part because members arrived late and at different times (two members actually arrived 45 minutes after the group began). Although the participants were motivated and willing to participate, developing blanket "approval" of questionnaire items proved difficult.

### **A Comparison: Uses of the Laboratory and Group in Survey Design**

The cognitive laboratory and the design-oriented focus group have established their place in qualitative research as a means of exploring or assessing survey methodology or questionnaires. Through a comparison, this paper will show that the two methods are actually working partners. The cognitive laboratory can be used effectively prior to a focus group, after a group as a followup, or as a substitute for a group to handle special circumstances not easily accommodated in a group setting. Five usages of the two techniques are presented here, and case examples are discussed to illustrate the main points.

#### **1. Use of the Cognitive Laboratory as Preparation for a Design-Oriented Focus Group**

The cognitive laboratory can be used as preparation for a subsequent focus group. An individual, in-depth focused laboratory can prepare both a respondent and the moderator to use the subsequent group context more effectively. The

laboratory prepares respondents by getting them to reflect in a detailed way about the questions. Respondents enter the group context after reflecting on their individual circumstances in depth. This process helps to equalize differences in individual interpersonal styles, such as degrees of extraversion or dominance. All respondents thus enter the group "on the same wavelength," better synchronized in respect to the detailed purposes of a design-oriented focus group. Finally, respondents' afterthoughts about the laboratory can be expressed in the group rather than lost to the research effort.

Of the three focus groups conducted to improve FHWAR surveys, the one in which participants attended the laboratory one day and the focus group the next day produced the most informed participants. Review of the transcripts of all three groups indicates that this group produced the fullest range of thoughts and comments on the questionnaire and design options. In fact, only a little was learned from the other two focus groups that had not already emerged from this group.

The laboratory also prepares the moderator for the focus group, particularly in an only or initial effort to assess a questionnaire, by familiarizing the moderator with differences in participants' personalities, reactions, and concerns about the questionnaire. It also helps the moderator formulate a more complete and focused topic guide for conducting the group.

Use of the cognitive laboratory as preparation for a focus group can be expected to be most effective in assessment of an existing questionnaire. It is likely to be less effective as preparation for a focus group conducted to explore topics for a questionnaire. In fact, the best use of laboratories may be to conduct them as in-depth followups to a group in which initial ideas are generated.

#### **2. The Use of Cognitive Laboratories to Focus on Unusual Respondents**

The cognitive laboratory can be used to focus on atypical respondents not easily accommodated in a group context. In this sense, the laboratory can supplement the efforts of a design-oriented focus group. The focus group can be used to assess questionnaires with a typical group of respondents varied only by the usual demographic, socioeconomic, or topic-specific measures. The atypical or unusual respondent can better contribute in the laboratory than in a group.

For example, the SESTAT surveys emphasized employment status and transitions in the work force

over a time period. The focus groups included members of various occupations, degree fields, and the usual demographic variables. Most members were either actively participating in the work force or expected to look for a job later. Since a retired person actually ignores most of the questionnaire, no more than one person in the group could be of retired status. While the retired person's willingness to participate or opinions about how relevant the questionnaire appears to his or her particular circumstance can be invaluable, a retired person is largely unable to assess most questions since he or she tends to skip over them. Therefore, the retired person may either take up too much time in group discussion on lower-priority issues or may stay quiet and feel left out. In the SESTAT surveys, the retired person is an ideal participant in a laboratory, where his or her special circumstances in relation to participation and the questionnaire can be more fully explored without disrupting the group.

Other atypical examples in the SESTAT surveys include a woman who has permanently dropped out of the labor force to raise a family; a person who is educated in the sciences but makes a permanent transition to something radically different, such as becoming an artist; or a "perennial" student who is spending extended periods of time studying in diverse fields. All of these examples actually characterize SESTAT sampled cases. For SESTAT, the willingness of these peripheral groups to participate in the survey is important, particularly since two of three surveys are conducted by mail (self-administered), with telephone followup directed only to nonresponders.

### **3. The Use of Cognitive Laboratories and Groups with Less Literate or Reliable Respondents**

The success of a design-oriented focus group with less literate or reliable respondents may depend on its purpose. These respondents may be poverty-stricken, not well educated, or impaired by age or disease. While they may be highly motivated to participate in a focus group in preparation for a survey on a topic of importance, their ability to evaluate the detailed formulation of particular questions by such criteria as comprehension, recall problems, and cognitive complexity may be difficult. They may do better in focus groups used in earlier stages of questionnaire design, when opinions about topics and issues of interest are emphasized.

An example to support these assertions would be the "informal" cognitive laboratories and the

focus group conducted with Medicaid beneficiaries. The participants had lower incomes and less education and many had emotional or health concerns. The questionnaire was lengthy (a 30-minute telephone interview) and covered a wide range of health topics. It included behavioral frequency questions on health care utilization, description of health status, and an evaluation of access to health care. Clearly, more detailed information about problems with particular questions was gleaned from the individually focused laboratories than from the group. During the laboratories, respondents could "think aloud" and thus reveal any difficulties or differences with interpretation of the questions. They could be asked to paraphrase questions or rate their confidence in the accuracy of their answers.

Detailed assessment of the questions was more difficult in the focus group context. First, all participants except one arrived late and at different times. Two participants arrived 45 minutes after the session had begun. All participants were glad to be there and wanted to voice their opinions, but they were most interested in commenting on problems with their health care and access afforded by Medicaid. This group approach is more suited to exploration of potential questionnaire topics than to detailed assessment of existing questions. The group did review the questionnaire, but most said that they understood the questions and had no problems answering them. The laboratory approach can provide more feedback on the need to fine-tune the questions. The group dynamics were valuable, however, especially the comments pertaining to the need for additional questions or the conditions under which participants would take part in a telephone survey of Medicaid beneficiaries. For example, participants said that a financial incentive was not necessary and that they would participate for other reasons, such as the opportunity to voice concerns about their health care.

### **4. The Use of Cognitive Laboratories to Formulate the Topic Outline for Focus Groups**

During the initial stages of assessing existing survey methodology and a questionnaire in particular, cognitive laboratories can be used to identify topics that should be addressed in one or more design-oriented focus groups. The laboratory can be used to identify questionnaire issues and problems; the focus group can be used to determine how prevalent a problem may be or under what conditions or for what type of person it exists.

An experienced qualitative researcher might review a questionnaire and formulate some hypotheses about its potential problems. These hypotheses can then be confirmed or rejected in the cognitive laboratories. The laboratories can be used to develop a comprehensive list of topics for the focus groups. The groups can then be utilized to determine how extensive or serious a problem is.

The findings of cognitive laboratories were used to formulate topic guides for the FHWAR, SESTAT, and Medicaid access focus groups. For example, a topic guide prepared for the SESTAT cognitive laboratories was adapted to some degree with each participant. The laboratory results were used to further refine the topic guide for the first focus group. Some problems identified by the laboratories were so major that changes were made to the questionnaire and its instructions prior to the group session. The revisions were then tested in the group. The laboratory results also underlined the need to test with the focus group such issues as the content of the SESTAT cover letter and the effectiveness of using incentives.

#### **5. The Use of Cognitive Laboratories to Explore Unexpected Results of a Group**

The examples discussed here indicate how a cognitive laboratory can be used before a focus group or with an atypical population with special needs. The partnership of the cognitive laboratory and the focus group does not end there. The cognitive laboratory can also be used to clarify or explore unexpected results from a design-oriented focus group. Subsequent focus groups can also explore the unexpected results of an earlier focus group. Whether that method is pursued depends on whether the result to be investigated is considered a rare event, on the degree to which the method may require in-depth individual attention, or on the characteristics of the respondents (for example, less literate participants may do better in a laboratory setting).

For example, one unexpected result in the SESTAT surveys was a differential response to the work activities question. The original question, which asked for activities routinely performed, provided 18 response categories, each to be answered "yes" or "no." The unexpected finding in several focus groups was that some respondents interpreted this question liberally, answering with many "yes" responses, while others in similar circumstances answered conservatively, with few "yes" responses. A selection of similar participants,

with half answering each way, could be assembled in a laboratory setting to determine how they formulated their responses. Other important issues, such as why college professors or nonscientists react differently to a particular question, might warrant followup in a group setting.

#### **Summary**

This paper has described and compared the uses of cognitive laboratories and design-oriented focus groups in survey design. Of particular importance is the comparison of their use in assessing existing questionnaires, particularly those that may be used on a longitudinal basis. Cognitive laboratories and design-oriented focus groups are potential partners in the qualitative assessment of survey methodologies and questionnaires. Cognitive laboratories were shown to be useful in preparing participants or moderators and in developing topics for subsequent focus groups. Cognitive laboratories were also shown to be useful after a focus group to explore unexpected results from the latter. Finally, cognitive laboratories were shown to complement focus groups when used to focus on rare or atypical respondents or less literate or reliable respondents.

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