QUESTIONNAIRE DESIGN FOR ESTABLISHMENT SURVEYS

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Introduction

A workshop on Questionnaire Design for Establishment Surveys took place at the International Conference on Establishment Surveys in Buffalo, New York, on June 27, 1993. The instructor was Allen R. Gower, Head of the Questionnaire Design Resource Centre at Statistics Canada.

This paper provides selections from the notes that participants received during the workshop. The half-day workshop focused on the design of survey questionnaires for businesses, farms, and institutions.

Topics included the use of pretesting, focus groups, and cognitive research methods in the development of questionnaires. Also covered were types of questions and considerations in question design and wording. Examples of questionnaires used by Statistics Canada and by statistical agencies in other countries were used to illustrate the principles and practices of questionnaire design for establishment surveys.

Establishment Survey Questionnaires

Establishment surveys include ***surveys of businesses, farms, and institutions.*** An establishment survey may ask for information about the establishment itself, or about a more aggregated (*e.g.,* corporation, agency), or less aggregated (*e.g.,* division, department) level of organization.

A business survey may require information about a company's employees, inventories, products or sales. A farm survey may collect information about a farm's operations including data on crops and livestock. A survey of educational institutions may collect data about students, teachers or other employees. A survey of health institutions may collect information about employees, patients or facilities.

Establishment surveys are frequently conducted by mail. They also can be administered by an interviewer in person or over the telephone. Follow-ups to mail surveys often are conducted by telephone. New data collection technologies involve cotmputer-assisted interviewing, fax machines, touchtone self-response, and the electronic transmission of data.

Establishment survey respondents answer in their role as employers or employees of an establishment, primarily during working hours. The ***respondent's functional position and level of responsibility within the establishment*** affects how a questionnaire is completed. Identifying the most appropriate person to provide the information is critical in establishment surveys.

Response burden is a very real concern for respondents. It involves the number of questions that are asked and the time required to complete the questionnaire. Response burden also includes the effort that respondents put into searching or manipulating other data sources to provide the information in the format requested.

Establishments vary in size. Large establishments may have employees whose responsibilities include completing forms for governments and surveys. In small establishments, the respondent often is the owner or office manager who may not have as much time or flexibility in their schedule.

There are fundamental differences between establishment surveys and household surveys. For example, they differ in the type and complexity of the information requested. While household respondents answer from memory, data provided by respondents in establishment surveys typically involves the ***use of records*** or other information systems. Questionnaires generally contain ***technical or professional terminology*** associated with providing ***financial or administrative data.*** These are important considerations that should be taken into account when designing questionnaires for establishment surveys.

Questionnaire Development and Testing

1. Objectives, Data Requirements, and Analysis Plan

Define the objectives and information requirements. Prepare a document that provides a clear and comprehensive statement of objectives, data requirements, and the analysis plan. This document is a necessary step that leads to the determination of the variables to be measured and, ultimately, the survey questions and response alternatives.

Ensure that the questions relate to the survey objectives and information requirements. Establish the rationale for each question, how the information will be used, and whether the questions will be good measures of what is required.

2. Consultation

In formulating objectives and preparing the analysis plan, consult with clients and data users to understand fully their requirements and expectations. Contact subject matter experts for advice and guidance.

If possible, also consult with members of the target population. This will help identify issues and concerns that are important to the target population, and may affect decisions regarding the content of the questionnaire.

3. Previous Questionnaires

Examine questions that were used in other surveys on the same or a similar topic. This provides a useful starting point in the formulation of questions.

In some situations (*e.g.,* for data comparability over time), the same questions may be used. Ensure that the questions provide valid, consistent, and effective measures of what is required.

4. The Use of Focus Groups in Developing Questionnaires

A ***focus group*** is an informal discussion of a selected topic involving participants chosen from the population of interest. It provides insights into the attitudes, opinions, concerns, and experiences of the participants. A focus group is led by a moderator who is knowledgeable about group interviewing techniques and the purpose of the discussion.

Focus groups provide the opportunity to consult with the target population, data users, and interviewers. In the early stages of developing a questionnaire, focus groups are used to clarify the survey objectives and data requirements, to identify salient research issues, and to clarify definitions and concepts.

Focus groups also are useful in testing and evaluating questionnaires (see 7. The Use of Cognitive Methods in Testing Questionnaires). They are used to evaluate respondents' understanding of the language and wording used in questions and instructions, and to evaluate alternative question wordings and formats.

Participants from establishments present unique challenges in recruiting. The usual incentive or honorarium of $30 to $50 may not be appropriate for business people. Assurances of confidentiality and emphasis on the importance of the survey and their participation in the study are more meaningful. Another type of incentive is a donation to the non-profit organization of the participant's choice. Statistics Canada often gives focus group participants a copy of a publication that is of interest to them.

Focus groups should be conducted at a time that is convenient to the participants. For business people, focus groups are usually held during working hours. Other times of the day are more appropriate for other types of respondents. For example, focus groups with farm operators can be held during the evening.

Focus groups vary in size from 6 to 12 persons. The optimum size is 7 to 9 persons. Smaller groups with 4 or 5 people are sometimes called mini focus groups or mini groups.

Focus groups are audio-recorded, and are viewed by observers in an adjoining room behind a one-way mirror.

5. Considerations in Drafting the Questions

Many considerations go into formulating the questions and response categories. Primarily these considerations reflect the following:

- Objectives and data requirements
- Analysis plan
- Method of data collection
- Data processing requirements
- Respondents
- Availability of the data
- Response burden
- Complexity of the data to be collected
- Confidentiality and sensitivity of the information
- Comparability of results with other surveys
- Data reliability
- Nonresponse
- Interviewers
- Administrative requirements

6. The Response Process

Responding to a question involves four distinct processes:

- *Understanding*
- *Retrieval*
- *Thinking/judging*
- *Communicating an answer*

Respondents must first understand the question. They then search their memories to retrieve the requested information. After retrieving the information, they think about what the correct answer to the question might be and how much of that answer they are willing to reveal. Only then do they communicate an answer to the question.

Most establishment surveys involve the ***use of records***. Respondents must normally access one or more external sources of information such as administrative or financial records.

The ability of respondents to retrieve the requested information will depend upon their familiarity with and understanding of the external source of information. They also must understand the relationship between the survey questions and the external data source. Multiple sources of information may add to the difficulty or complexity of this task. Further complexities may be introduced if the respondent has to consult another individual who can provide the requested information and who, in turn, may have to use one or more data sources.

7. The Use of Cognitive Methods in Testing Questionnaires

Questionnaire testing is essential to developing effective questionnaires that collect useful and meaningful data. Cognitive research methods, also referred to as qualitative testing, are especially useful in testing questionnaires.

Cognitive methods provide the means to examine respondents' thought processes as they answer the survey questions. They are used to ascertain whether or not respondents understand what questions mean. In this way, cognitive methods help assess the validity of questions and identify potential sources of measurement error.

Cognitive methods provide the opportunity to evaluate the questionnaire from the respondent's point of view. They focus on issues such as comprehension and reactions to the form. This brings the respondent's perspective directly into the questionnaire design process. The use of cognitive methods leads to the design of respondent-friendly questionnaires that can be easily and accurately completed.

In establishment surveys, cognitive methods are used to investigate the relationship between the respondent and the external information source as well as the influence that this data source has on the response process. These methods provide the means to assess the compatibility of question wording, time reference periods, and response categories with the establishment's record-keeping practices.

Cognitive testing methods include:

• *In-depth interviews*

The technique involves one-on-one interviews (sometimes called *retrospective think-aloud interviews*). Respondents first complete the questionnaire as they normally would. An interviewer observes the process. The observer notes areas of the form read, the sequence in which the questions are answered, reference made to instructions, types of records or other persons consulted, the time required to complete sections, and corrections or changes made to responses.

The interviewer then conducts the in-depth interview and obtains information about the respondent's experiences and impressions in completing the form. The follow-up discussion typically involves a review of the questionnaire, question by question, with the respondent to discuss any problems or difficulties that were encountered while completing the form. The interviewer probes to see how respondents interpreted terms and concepts, how and why they chose responses, and how they recalled information especially if the question covers a long reference period.

In the case of an interviewer-administered questionnaire, the questions are first asked by an interviewer either in person or by telephone. The in-depth follow-up discussion takes place following this first interview.

• *Concurrent think-aloud interviews*

The respondent is observed and asked to "think aloud" while answering the questions, commenting on each question and explaining how the final response was chosen. The observer may probe the responses to get more information about a particular statement or to clarify the process through which a response was chosen.

The success of the concurrent think-aloud interview technique depends on the respondents' ability and willingness to articulate and express their thoughts aloud. The observer sometimes may have to help respondents in this task by gently prompting them with comments such as: "what question are you answering now?," "what are you thinking now?," "please explain how you chose the answer," or other probes to clarify the respondent's thoughts. When respondents are reluctant to articulate their thoughts, the observer may decide that the best approach is to handle the interview as an in-depth interview and proceed accordingly.

Think-aloud interviews are very useful in obtaining respondents' reactions to questionnaires. They are especially helpful in identifying areas of the questionnaire where the respondent has difficulty and in understanding the process through which the questionnaire is completed.

• *Focus groups*

Focus groups are used to evaluate respondents' understanding of the language and wording used in questions and instructions. The questionnaire is usually administered before the focus group session in person, over the telephone or on a self-completion basis as appropriate.

During the focus group session the moderator reviews the questionnaire with the participants and discusses any problems or difficulties that they may have encountered when completing the form. In this way focus groups encourage thoughtful analysis of the questionnaire. They are especially useful in providing suggestions and recommendations for improvements.

• *Paraphrasing*

Paraphrasing is used in one-on-one interviews and focus groups. Respondents are asked to repeat the question in their own words, or to explain the meaning of terms and concepts that are used in the survey questions and instructions.

Paraphrasing helps determine whether respondents read and understand the instructions and questions correctly. Paraphrasing is especially helpful in identifying situations where the question wording is too complex or confusing and where respondents do not comprehend all the important components of the question, such as the recall period.

8. Pretesting

Pretesting is a fundamental step in the process of developing a questionnaire. It involves a relatively small number of field interviews that are carried out to identify problems with a questionnaire. The entire questionnaire or only a portion of it may be tested.

Pretests are useful for discovering poor question wording or ordering, errors in questionnaire layout or instructions, and problems caused by the respondent's inability or unwillingness to answer the questions. Pretests also are used to suggest additional response categories that can be pre-coded on the questionnaire. Pretests provide a preliminary indication of the interview length and refusal problems.

The pretest sample can range in size from 20 to 100 or more respondents. If the main purpose of the pretest is to discover wording or sequencing problems, only a minimum number of interviews may be required. More interviews (50 to 100) are necessary to determine pre-coded answer categories based on open-ended responses obtained in a pretest. Respondents are generally selected purposively rather than randomly.

The questionnaire should be administered in the same manner as planned for the main survey (*e.g.,* interviewer-administered in person or by telephone). A pretest of a mail questionnaire is more effective if interviewers are used. Interviewers can be used to deliver the questionnaire and, afterwards, to discuss any problems. The questionnaire designers should observe as many pretest interviews as possible.

Pretesting is not as effective as cognitive methods in evaluating respondents' understanding and the difficulty of the response task. Pretesting only indicates that there is a problem. Without further investigation, it does not identify why there is a problem nor how it can be corrected.

Debriefing sessions with interviewers often occur in conjunction with a pretest. Interviewers can identify important problem areas where the questionnaire can be improved. During the redesign of existing questionnaires, it is useful to consult with interviewers to get their input into the redesign process. Interviewers have excellent insights into the logistics of administering the questionnaire and how it affects respondent cooperation.

Behavioral coding also can be conducted at the time of pretesting. Behavioral coding provides a systematic and objective means of examining the effectiveness of the questionnaire. The interview is audio-recorded, and the interviewer-respondent interaction is later analyzed. Behavioral coding helps identify problem areas such as an interviewer failing to read the question as worded or a respondent asking for clarification of the question or response task.

9. Formal Testing Methods

Formal testing methods are quantitative in nature. They are designed to provide a statistical evaluation of how the questionnaire performs. Pilot studies and split sample testing are two types of formal testing methods. These methods are more suitable for large scale and continuing surveys because of the significant cost associated with a large sample size and the analysis of the results.

A ***pilot study*** is conducted in order to observe all survey operations working together, including the administration of the questionnaire.

A pilot study is a "dress rehearsal." It duplicates the final survey design on a small scale from beginning to end, including data processing and analysis. It allows the survey researcher to see how well the questionnaire performs in conjunction with other phases of the survey. Normally, the questionnaire should be thoroughly pretested before a pilot test takes place. A pilot study is usually not the time to try out new questions or approaches.

If previous testing has been carried out, it is unlikely that the pilot study will result in major changes to the questionnaire. The pilot study, however, does provide the opportunity to fine tune the questionnaire before its administration in the main survey.

Split sample testing is conducted to determine the "best" of two or more alternative versions of the questionnaire. Split sample testing also is referred to as "split ballot" or "split panel" experiments. It involves an experimental sample design that is incorporated into the data collection process. In a simple split sample design, half of the sample receives one version of the questionnaire and half, the other.

10. Review and Revision of the Questionnaire

The questionnaire should be reviewed by someone outside the project team. Reviewers could include subject matter experts or persons who have experience in designing questionnaires. A review can take place at any or all stages of the questionnaire development process.

The review and testing of the questionnaire lead to revisions in the questions and response categories. Throughout the whole process of questionnaire development and testing, changes will continually be made to improve the questionnaire. In this way, questionnaire design is an iterative process. Objectives and information requirements are stated, evaluated and decided upon, data users and respondents are consulted, proposed questions are drafted and tested, questions are reviewed and revised, until a final questionnaire is developed.

Types of Questions

There are two main types of questions: ***open*** and ***closed questions.*** They are sometimes called open-ended and closed-ended questions.

Open questions are answered in the respondent's own words. An open question allows the respondent to interpret the question and answer freely. The respondent writes the answer or the interviewer records verbatim what the respondent says in answer to the question. Blank spaces are left in the questionnaire after the question for the response to be written in. Establishment survey questionnaires frequently contain open questions with labelled answer spaces where respondents or interviewers are asked to record data.

Closed questions are answered by checking a box or circling the proper response from among those that are provided on the questionnaire. A closed question restricts the respondent or interviewer to select from the answers or response options that are specified.

Question Design and Wording

1. Considerations in Question Wording

✓ Are the words simple, direct and familiar to all respondents?
✓ Are the questions as clear and as specific as possible?
✓ Are the questions applicable to all respondents?
✓ Are any of the questions double-barrelled?
✓ Are the response categories mutually exclusive and exhaustive?
✓ Are any questions leading or loaded?
✓ Do the questions read well?

2. The questions should be designed to:

✓ Encourage respondents to complete the questionnaire
✓ Facilitate respondents' recall
✓ Direct respondents to the information source
✓ Focus on the topic of the survey
✓ Follow the logic of the respondent
✓ Flow smoothly from one question to the next

3. It is important to ensure that:

✓ Time reference periods are clear to the respondent
✓ Questions, time reference periods, and response categories are compatible with the establishment's record-keeping practices (this is often difficult to achieve)

4. The Introduction

✓ Provide the title or subject of the survey
✓ Identify the sponsor
✓ Explain the purpose of the survey
✓ Request the respondent's co-operation
✓ Indicate the degree of confidentiality and any data sharing arrangements
✓ In mail surveys, provide the return address and the date for return

Establishments are asked to complete many forms and questionnaires. Completing them is not a priority. Typical reactions include:

- "I complete the shortest form first"
- "Is completion mandatory?"
- "Is there a return deadline?"

A respondent once commented that if the answer to these last two questions is "no," then *"I put it [the questionnaire] in my maybe I'll get to it someday basket!"*

Respondents frequently question the value of information to themselves and to other users. Some like to receive feedback about the survey. Therefore:

- ✓ Explain why it is important to complete the questionnaire
- ✓ Ensure that the value of providing information is made clear to respondents
- ✓ Explain how the survey data will be used
- ✓ Explain how respondents can access the data

5. The Opening Questions

- ✓ The opening questions should relate to the introduction and the survey objectives
- ✓ They should be applicable to all respondents
- ✓ They should be easy and interesting to complete
- ✓ If necessary, they should establish that the respondent is a member of the survey population

6. Instructions

Respondents read only what they think is necessary to read. They read the boldface print first, and then decide whether they should read further.

Respondents rarely read the instructions, and proceed directly to the questions. They only refer to the instructions when they think they need help. As a result, respondents may miss important instructions and definitions. Errors in reporting often are due to a lack of instructions or misunderstanding what to include or exclude. Therefore:

- ✓ Ensure that instructions are short and clear
- ✓ Tell the respondent where to find the instructions
- ✓ Provide definitions at the beginning of the questionnaire or in specific questions as required
- ✓ Use **boldface print** to emphasize important items such as the reference or reporting period
- ✓ Specify "include" or "exclude" in the questions and items themselves (not in separate instructions)

7. General Guidelines for the Layout of the Questionnaire

- ✓ The questionnaire should appear interesting and easy to complete
- ✓ The questionnaire should be *respondent-friendly*
- ✓ The cover letter and front cover should create a positive first impression
- ✓ The questionnaire should appear professional and business-like
- ✓ If administered in person or over the telephone, the questionnaire should be *interviewer-friendly*
- ✓ Provide titles or headings for each section of the questionnaire
- ✓ The instructions and answer spaces should facilitate proper answering of the questions
- ✓ Illustrations and symbols (such as arrows and circles) should be used to attract attention and guide respondents or interviewers
- ✓ The last page or end of the questionnaire should provide space for additional comments by respondents
- ✓ Include an expression of appreciation (thank you).

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