Questionnaire design

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Abstract

In the “ecosystem” of primary data investigation, designing questionnaires is the first and foremost step. This work is not complicated, but often causes a lot of confusion to scientists, especially young ones with little experience in drawing up questionnaires. Meanwhile, documents on designing questionnaires to serve scientific research are sketchy. In this chapter, with a view to solving the aforementioned problem, we will introduce and present the definition of a questionnaire, characteristics of a good questionnaire, the procedure for designing a questionnaire and prerequisite knowledge and skills.

Keywords: Primary survey, primary data, questionnaire method, model

Introduction

In the previous chapter, we have learned about primary data and the procedure for primary data collection. In this chapter, we will delve into questionnaires - a key part as well as the first step in the procedure for primary data investigation [1]. First of all, a questionnaire is simply understood as a set of questions that are closely related and towards a certain topic [2–6]. In primary data investigation, a questionnaire is employed to collect and store information and data of research subjects. Information in the questionnaire will be digitalized into a valuable data set that will be analyzed by models, statistical formulas to generate new knowledge and reach new conclusions, thereby answering research questions and confirming research hypotheses. Questionnaires are usually classified, according to methods of conducting, into face-to-face questionnaires, mail questionnaires and online questionnaires [7–9]. Of the three, face-to-face questionnaires are most frequently used. Nowadays, in a technology-driven era, online

questionnaires have become more diverse and are gaining popularity. Overall, the main contents of all three methods are the same, with only a minor difference in style and ways of questioning. Details of the three questioning methods are shown in Table 2.

Table 02. Comparison of questionnaire methods

	Face to face	Via mail	Online
Characteristics	<ul style="list-style-type: none"> - Researchers meet the interviewees in person to fill the questionnaire. 	<ul style="list-style-type: none"> - The questionnaire is sent via postal service deliveries or emailed to the interviewees to answer, then respondents will give feedback. 	<ul style="list-style-type: none"> - The questionnaire is designed to present itself to interviewees via websites or electronic devices located in crowded places (supermarkets, shopping centers, etc.)
Advantages	<ul style="list-style-type: none"> - Effective when done in a particular geographical area with favorable traffic conditions. - Researchers are in a good condition to explain the purpose of the research and the meaning of the questions, thereby reducing inappropriate answers. - Access a full range of research subjects, regardless of educational background, age, income level and occupation, which is critical to social research. 	<ul style="list-style-type: none"> - The biggest advantage of this method is the ability to access a considerable number of research subjects living within a long distance from each other (globally). - Cost- and effort-saving when compared to the face-to-face method. 	<ul style="list-style-type: none"> - Large-scale and can be conducted and digitalized quickly and effortlessly as information is automatically saved on the spot. - Thanks to software and apps, the questionnaire can reach a wide audience.
Advantages	<ul style="list-style-type: none"> - Effective when done in a particular geographical area with favorable traffic conditions. - Researchers are in a good condition to explain the purpose 	<ul style="list-style-type: none"> - The biggest advantage of this method is the ability to access a considerable number of research subjects living within 	<ul style="list-style-type: none"> - Large-scale and can be conducted and digitalized quickly and effortlessly as information is

	<p>of the research and the meaning of the questions, thereby reducing inappropriate answers.</p> <ul style="list-style-type: none"> - Access a full range of research subjects, regardless of educational background, age, income level and occupation, which is critical to social research. 	<p>a long distance from each other (globally).</p> <ul style="list-style-type: none"> - Cost- and effort-saving when compared to the face-to-face method. 	<p>automatically saved on the spot.</p> <ul style="list-style-type: none"> - Thanks to software and apps, the questionnaire can reach a wide audience.
Conclusion	<p>In general, all methods have their own merits and demerits. Thus, researchers need to utilize each method flexibly to achieve efficiency. Of all three, face-to-face questionnaires should be given number one priority concerning accuracy and objectivity - the top criteria in scientific research, and accessibility as well. The remaining two methods can be used flexibly depending on the research purpose. For uncomplicated research with transparent questions and on a focus group, they are recommended given their advantages of time, effort and cost saving</p>		

Questionnaire structure

In terms of structure, a questionnaire usually has three parts: an introduction, a body and an end.

- *First:* the introduction. It should clearly state the research purpose, the project title and the survey research unit. A successful introduction containing well-chosen images and logos serves as a hook to capture the respondents' interest. Moreover, we can add some more information such as the reasons for participation and put an emphasis on the role of the interviewees in order to motivate them. Below is an example of the introduction of the questionnaire on land use of households living in some mountainous communes of Nghe An province [10], which clearly states the survey research unit, ID of the questionnaire (making it easier to categorize), illustrations, general layout, acknowledgments and guarantees (Figure. 1).

Figure 1. A snapshot of a page cover of the questionnaire

- *Second:* the body - the core of a questionnaire, which consists of questions bearing on the research topic. The content should be valid, complete and succinct. On top of that, questions should be arranged in a logical and interesting way in that the overwhelming number of questions in the previous section could discourage respondents. For example, in the study “Understanding the satisfaction of citizens with governments’ response to COVID-19”, the body is divided into different question categories corresponding to each research question. These questions are presented in a general-to-specific sequence. The questionnaire includes Likert scale¹ questions that help to gain basic yet useful information that shows whether the interviewees were properly aware of the survey, or to apply nominal scale in identifying suitable research subjects. These questions will acquaint interviewees with the study, assisting with the response to the ensuing part. Regarding format, they are an affirmation with different choices of certainty (usually from 1 to 5). Next are questions about public perceptions of COVID-19 impacts and attitudes towards

¹ A question that uses a 5 or 7-point scale, sometimes referred to as a satisfaction scale, that ranges from one extreme attitude to another. Typically, the Likert survey question includes a moderate or neutral option in its scale.

preventive measures. The last important part of the body is questions about voluntary payments, contributions to social organizations.

- *Third:* the end. This section consists of two small parts: personal information and acknowledgment, which must be kept at the end. Personal information will reveal name, age, occupation, hometown, demographics and so on. However, this section needs to exclude intimate information such as phone number or Gmail, for it might worry and discourage respondents from answering the next parts. Lastly, the acknowledgment should ensure succinctness and the designers' sincerity.

Characteristics of a good questionnaire

A good questionnaire should be:

- Complete, succinct: A questionnaire must cover all the information that researchers need to collect, meaning it is “complete”. Succinctness is important for two reasons. Firstly, a pithy questionnaire will avoid potential errors and misunderstandings by the questioners as well as the questioned. If a question is unduly long, it causes confusion. Also, the more questions participants need to answer, the more fatigue and boredom they might endure. All of these will exert an adverse influence on the accuracy of the collected information. Secondly, a succinct questionnaire is time- and cost-saving for the survey.
- Clear, easy to understand and answer: Given the diverse backgrounds of the interviewees, transparent questions are necessary to minimize errors and reduce the need for further explanation from the questioners.
- Digitizable: This feature enables in-depth analysis, thereby retrieving scientific information. Without it, the questionnaire would only bring about invalid, illogical and unreasonable conclusions.

The procedure for designing questionnaires

Designing a quality questionnaire is a prerequisite for the success of a scientific study. The foundation for a questionnaire is the research purpose and topic. In addition, the questions should closely and directly bear on the research hypothesis

or the research model (Figure.2). The designed questionnaire also needs to suit the research subject. Answering questions about information like the age range or occupation of respondents would help design a suitable questionnaire to create excitement and eagerness. It is also essential to note the geographic location in the questionnaire. For example, in areas where ethnic minorities with low literacy rate inhabit, researchers need to design a questionnaire that is concise and very easy to understand.

Figure 2. Relationship between the variables and the questions

Based on intimate knowledge and empirical experience in designing questionnaires, we propose a 6-step procedure to draw up a questionnaire as follows:

- Step 1. Construct the research hypothesis and the purpose of the topic
- Step 2. Learn about the research models that were used to find important variables. In previous studies, was a linear regression model utilized? How many relevant variables were there?
- Step 3. Build a model related to the variables. For example, in the survey of land use in upland communes of Nghe An province, we constructed a multivariate linear regression model where the dependent variable is income and the independent variables are factors affecting the household income such as land use, loan, labor experience.
- Step 4. Check and complete the model according to actual conditions via preceding survey. After this survey, add some important variables or remove unnecessary ones from the model.
- Step 5. Develop a detailed research outline and draw up a questionnaire. In this step, we will design a detailed questionnaire. Each question is intended to collect data according to each point in the detailed outline and may include variables. For example, in the model, the education level of the head of household is a variable. Thus, a question to obtain this type of information is designed.
- Step 6. Check the information and complete the questionnaire.

Question types and data types

In order to design a questionnaire, questions are divided into close-ended and open-ended questions. A close-ended question is a question with predefined answers, and the respondents can only choose between them [7,8]. Examples include dichotomous questions (yes/no questions), Likert scale questions (measuring importance, satisfaction level, etc.), multiple choice questions. An open-ended question is a question that respondents give their own answers (about their age, hometown, occupation, etc.).

Irrespective of question types, collected answers must fall into one of the following scales of measure: nominal, ordinal, interval and ratio. Questionnaire designers must understand what data type of each question is because it determines coding and analytical methods.

Question types and data types

- Nominal scale: It is used to classify subjects according to different features. For example, according to gender, “male” can be encoded as 0, “female” as 1; or to find out if the household is poor or not, “yes” is encoded as 1 and “no” as 0.
- Ordinal scale: It is used for ranking or comparison according to a certain criterion. Take the classification of students' academic performance as an example: 1 = Excellent, 2 = Good, 3 = Average, 4 = Fair, 5 = Poor.
- Interval scale: It is used for questions with quantitative answers. This scale has evenly spaced and continuous intervals. For example, questions with the answers denoting: 1 = totally disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = totally agree.
- Ratio scale: It is also used for questions with quantitative answers. However, this scale is different from the interval scale in that it contains information representing precise quantity. For example, person A is 30 years old and earns a monthly income of 20 million VND. The information about income could be used to compare with person B, whose monthly income is 10 million, half of that of person A.

Scales of measurement act as guidelines for questionnaire designers to know if their questions are “correct”. A “correct” question will yield answers that can be measured and encoded into one of the four scales above.

The quality of the questionnaire determines that of the research. Therefore, it is crucial to enhance the questionnaire. To achieve this end, researchers could consult experts who are highly experienced in designing questionnaires or participate in primary data investigations. Another way is through the focus group. Thanks to a pilot survey, researchers take a holistic approach to factors affecting the quality of the information obtained, analyze data to test if the results meet expectations, thereby adjusting the questionnaire accordingly. Moreover, listening to and synthesizing opinions of surveyors about difficulties that they face, for example, and of the surveyed people about the questions, unnecessary or inadequate, will also help improve the quality of the questionnaire.

Conclusion

Although the procedure, structure and content of the questionnaire are not too complicated, profound knowledge and a set of skills are required of a questionnaire designer. Each and every question in the questionnaire must have a clear theoretical basis and purpose. For young researchers with little experience in primary data investigation through questionnaires, especially students who start learning to “do science”, participating in training classes and designing a questionnaire first-hand would stand them in good stead. This learning along with practicing will help them draw experience in designing questionnaires for the next time.

Review questions

1. What is a questionnaire? Explain why it is used in the primary data investigation?
2. Present the structure of a questionnaire and summarize the content of each part.
3. Which factors should be noted when designing a questionnaire?
4. Name types of data scales and the characteristics of these scales?

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