Questionnaire Designing for a Survey

S Roopa, MS Rani

ABSTRACT

Questionnaires are frequently used in quantitative marketing research and social research. A questionnaire is a series of questions asked to individuals to obtain statistically useful information about a given topic. When properly constructed and responsibly administered, questionnaires become a vital instrument by which statements can be made about specific groups or people or entire populations. They are a valuable method of collecting a wide range of information from a large number of individuals, often referred to as respondents. Adequate questionnaire construction is critical to the success of a survey. Appropriate questions, correct ordering of questions, correct scaling, or good questionnaire format can make the survey worthwhile, as it may accurately reflect the views and opinions of the participants. A useful method for checking a questionnaire and making sure it is accurately capturing the intended information is to pretest among a smaller subset of target respondents.

Keywords: Questionnaire, Survey, Research.


INTRODUCTION

The questionnaire was invented by Sir Francis Galton, a British anthropologist, explorer and statistician in late 1800. Questionnaire forms the backbone of any survey and the success of it lies in the designing of a questionnaire.

As defined ‘A questionnaire is simply a list of mimeographed or printed questions that is completed by or for a respondent to give his opinion’.

A questionnaire is the main means of collecting quantitative primary data. A questionnaire enables quantitative data to be collected in a standardized way so that the data are internally consistent and coherent for analysis. Questionnaires should always have a definite purpose that is related to the objectives of the research, and it needs to be clear from the outset how the findings will be used.

A questionnaire is used in case resources are limited as a questionnaire can be quite inexpensive to design and administer and time is an important resource which a questionnaire consumes to its maximum extent, protection of the privacy of the participants as participants will respond honestly only if their identity is hidden and confidentiality is maintained, and corroborating with other findings as questionnaires can be useful confirmation tools when corroborated with other studies that have resources to pursue other data collection strategies.

Questionnaire Design

In order to gather useful and relevant information it is essential that careful consideration is given to the design of your questionnaire. A well-designed questionnaire requires thought and effort, and needs to be planned and developed in a number of stages (Fig. 1):

Types of Survey Questions

There are about four different types of questionnaire designing for a survey. They are applied according to the purpose of the survey.

1. Contingency questions/Cascade format
2. Matrix questions
3. Closed-ended questions
4. Open-ended questions.

Contingency Questions/Cascade Format

A question that is answered only if the respondent gives a particular response to a previous question. This avoids asking questions to people that do not apply to them.
**Example:** Asking the experience of braces treatment in children who have not undergone orthodontic treatment.

**Matrix Questions**

Identical response categories are assigned to multiple questions. The questions are placed one under the other, forming a matrix with response categories along the top and a list of questions down the side. This is an efficient use of page space and respondents’ time.

*Example:* Carver and White’s BIS/BAS scale. Behavioral approach system (BAS)/behavioral avoidance (or inhibition) system.

**Closed-ended Questions**

Respondents’ answers are limited to a fixed set of responses. Most scales are closed ended. Types of closed-ended questions include:

a. Yes/No questions—The respondent answers the questions with a ‘yes’ or a ‘no’.

*Example:* Have you ever visited a dentist?

b. Multiple choice—The respondent has several options from which to choose.

*Example:* How would you rate this product
(i) Excellent (ii) Good (iii) Fair (iv) Poor

c. Scaled questions—Responses are graded on a continuum (example: Rate the appearance of the product on a scale from 1 to 10, with 10 being the most preferred appearance). Examples of types of scales include the Likert scale and Semantic differential scale.

*Example:* Are you happy with your child’s teeth arrangement?
(1) Strongly disagree (2) Disagree (3) Don’t know (4) Agree (5) Strongly agree

A semantic differential scale is a list of opposite adjectives to measure psychological meaning of an object to an individual.

*Example:* Rate the park on the following dimensions:

Safe : : : Dangerous
Dirty : : : Clean
Quiet : : : Noisy

**Open-ended Questions**

The options or predefined categories are not suggested. The respondent replies in their own words without being constrained by a fixed set of possible responses. Types of open-ended questions include: 4-6

a. Completely unstructured—For example, ‘What is your opinion on questionnaires?’

b. Word association—Words are presented and the respondent mentions the first word that comes to mind.

**Ideal Requisites of a Questionnaire**

A questionnaire should:
1. Be composed of a simple and a specific language
2. Demand one answer on one dimension
3. Yield a truthful and accurate answer
4. Accommodate all possible contingencies of a response
5. Have mutually exclusive response options
6. Produce variability in response
7. Minimize social desirability.

**Main Aspects of a Questionnaire**

There are three main aspects of a questionnaire:
1. General form
2. Question sequence
3. Question formulation and wording.

**General Form**

A questionnaire can be either structured or unstructured. Structured questions are those questions in which there are definite, concrete and predetermined questions. The questions are presented with exactly the same wordings and in the same order to all respondents. A highly structured questionnaire is one in which all questions and answers are specified and comments in respondents own words are minimized.

*Example:* Do you have a driver’s license?
( ) Yes
( ) No

When these characteristics are not present in a questionnaire, it is termed as unstructured or nonstructured questionnaire. Interviewer is provided with a general guide on the type of information to be obtained, but the exact question formulation is largely his own responsibility and replies are to be taken down in respondent’s own words.

*Example:* How can we stop dental caries?

**Question Sequence**

The question sequence must be clear and smoothly moving. A proper sequence of questions reduces considerably the chances of individual question being misunderstood. The first few questions are particularly important because they are likely
to influence the attitude of respondents and in seeking his desired cooperation.

The following questions should be avoided as opening questions:

i. Questions that put great strain on memory
ii. Questions of a personal character
iii. Questions related to personal wealth.

Relatively difficult, personal and intimate questions should be kept toward the end. Thus, question sequence should usually go from the general to the more specific questions.

**Question Formulation and Wording**

Question should be very clear and impartial in order not to give a biased picture of the true state of affairs. In general the questions should meet the following standards. Should be:

i. Easily understood
ii. Be simple
iii. Should convey only one thought at a time
iv. Be concrete and conform as much as possible to respondent’s way of thinking
v. Words with ambiguous meanings must be avoided
vi. Danger words, catch words and words with emotional connotations must be avoided.

**Methods to Reach Target Respondents**

1. Face-to-face interview
2. Telephonic interview
3. Mail questions
4. Internet questions

**Face-to-face Interview**

Personal interviews are surveys conducted in person by an interviewer who usually goes to the person being surveyed.

*Merits:* High response rates can clarify questions if necessary, control over respondent selection, can use longer, more complex questionnaire and easier to motivate respondents.

*Demerits:* High costs, time-consuming, more administrative requirements selecting and training interviewers, traveling and contacting respondents.

**Telephonic Interview**

Telephonic surveys are usually conducted from a central office that places telephone calls to selected households or business.

*Merits:* Good response rate, fast, control over respondent selection. If a comprehensive list of the target population is available, there is likelihood of obtaining a high representative sample.

*Demerits:* Questions must be short and not complex, cannot control interruption by others in household/office, hard to find persons at home, requires training and quality control monitoring of the interviewers and usually difficult to target a specific geographical location.

**Mail Questions**

Mail questions are written surveys that are sent through the mail to selected members of the population to be surveyed.

*Merits:* Good response rate with rigorous follow-up procedures, relatively easy to obtain listed population and locate respondents, easy to administer and relatively low cost, can cover a wider geographical area and is more manageable for handling larger samples.

*Demerits:* Questionnaire may be given to someone else to fill out or may not reach the desired respondent, most difficult type of questionnaire to design, hard to interpret open-ended questions and time-consuming.

**Internet Questions**

Internet surveys are a form of a written survey. Respondents are invited to participate in the survey through e-mail when they visit a particular web page.

*Merits:* Fast to conduct and tabulate, some software products allow questionnaires to be customized depending on respondents answers, avoids interviewer bias and distortion, answers unlikely to be socially influenced, easy to administer and relatively low cost.

*Demerits:* Information transferred via the internet may not be confidential, poor control over respondent selection, follow-up difficult to conduct, difficult to obtain probability sample and like the mail surveys, this is the most difficult type of questionnaire to design.

**Pilot Survey/Pretesting Questions**

**Pilot survey:** A preliminary part of research conducted before a complete survey to test the effectiveness of the research methodology.

**Purpose of Pretesting**

To determine whether:

i. The questions are properly framed
ii. Wording of the questions will achieve the desired results
iii. The questions have been placed in the best order
iv. The questions are understood by all classes of respondents
v. Additional or specifying questions are needed or some need to be eliminated
vi. Instructions to interviewers are adequate.

**Basic Steps in Pretesting**

1. Select the sample similar in socioeconomic background and geographic location which is intended to be used in the main study.
2. Instruct interviewers to note all respondents’ remarks regarding instructions or question wording.
3. Administer the questionnaire.
4. Check the results.

Reliability

Reliability refers to the extent to which a measurement gives consistent results. In pretesting of questionnaire, one should check the following:

- Inter-interviewer reliability
- Test-retest reliability
- Internal consistency reliability

Inter-interviewer Reliability

This is used to assess degree to which the different interviewer’s gives consistent interpretation of the same phenomenon in case of interview administered questionnaire.

Test-retest Reliability

This is used to assess the consistency of response from one time to another.

Both interobserver reliability and test-retest reliability is checked by kappa statistics. The reliability is acceptable if the value is 80% or above.

The reliability of the tool is judged by estimating how well the items reflect the same construct. Will they yield similar results? This is expressed using the statistical test Cronbach’s (alpha). It is acceptable if the value is 80% or above. Once the reliability of tool is proven then one may proceed to test the validity. If a questionnaire is unreliable then it cannot be valid.

Internal Consistency Reliability

This is used to judge the reliability of the tool by estimating how consistent the results are for different items of the same construct.

Example: Impact of dental caries on the activities of daily living. If the respondent says he has pain due to dental caries and also tells he does not have trouble eating, that means the questionnaire is not framed properly.

Internal consistency reliability is expressed using the statistical test Cronbach’s- $\alpha$. It is acceptable if the value is 80% or above.

Validity

The degree to which a questionnaire measures what it was intended to measure. In questionnaire we check four types of validity:

- Content validity
- Face validity
- Criterion validity
- Construct validity

Content Validity

Refers to the extent to which a tool represents all aspects of a given social concept. Expert judgment is the primary method used to determine whether a test/tool have content validity. Statistical tests are not employed here. If content validity is acceptable, one can proceed to face validity.

Face Validity

This is an estimate of whether the item of a questionnaire seems to be appropriate, i.e. at face value are they getting the response in way the researcher aims to measure.

Face validity can be done using two methods:

1. Interview/Probe method: Here we select a random sample which is approximately 5 to 10% of final sample size and administer the questionnaire to them. Then the investigator will have a detailed discussion with them regarding each item, assessing their understanding about each question. Any modification may be done to decide the final format.

2. Bilingual method: It is employed if the tool is translated into a regional language. Here bilingual expert who is well-versed in both the languages is employed to assess the face validity. Ideally it should be done and approved by official translators.

Criterion Validity

It indicates the effectiveness of questionnaire in predicting the outcomes of what it measures. The responses on the questionnaire being developed are checked against on external criteria or by using gold standard which is direct and independent measure of what the new questionnaire is designed to measure. The criterion validity maybe concurrent or predictive. It is said to be concurrent when both the tools are administered simultaneously or predictive where the predictor tool is administered first and after some period a new tool is administered.

Construct Validity

This refers to the extent to which new questionnaire conforms (goes along with) to existing ideas or hypothesis concerning the concepts/constructs that are being measured.

Recognizing Poor Questions through Pretesting

The signs which indicate that there are errors in the early drafts of the questionnaire are as follows:

1. Lack of order in the answers: This may be due to use of difficult words or questions which attempt to obtain too much data at one time.

2. All or none responses: We can suspect that our question has elicited a mere stereotyped response or cliché, if all respondents answer the same way.

3. High proportion of don’t know or do not understand answers: Large percentage of do not know suggest that
the question is vague, it is too complex, it involves difficult answers or respondent is simply not in a position to answer the question.

4. High proportion of refusal to answers: This suggests that the interviewing instructions or training is insufficient. Restudy any question for which the refusal rate is over 5% or more.

5. Substantial variation in answers when order of questions has been changed: Wording of questions is not adequate, first alternatives are chosen more often, or choice of order is not proper.

CONCLUSION

A questionnaire is a tool which can be used in any type of research. This article is developed to give in-depth information about requisites like constructing a questionnaire, pilot testing them, standardizing them and reframing the poor questions. It is good practice to ‘pilot’ or pretest your questionnaire with a small sample of respondents. Before using it to check people’s understanding and ability to answer the questions, highlight the areas of confusion and look for any routing errors, as well as provide an estimate of the average time each questionnaire will take to complete.

A sincere effort from the authors in bringing about this article is to help the researchers to improve their ability in designing a questionnaire. A carefully and accurately designed questionnaire helps us to collect reliable information.

REFERENCES