QUESTIONNAIRE DESIGN

Introduction

The questionnaire design topic aims to introduce learners to the process of developing a questionnaire, including the developmental phases of questionnaire design, question wording, different types of questions, and the overall structure and layout. This topic will also cover testing the draft questionnaire

Audience

The intended audience of this topic is postgraduate students, researchers, instructors, and Decision makers who conducted various surveys.

Length of topic

This resource has been designed to supplement a 5-day topic.

Topic outcomes

By the end of this topic, learners will be able to:

- Highlight the steps in the questionnaire design process
- Familiarise themselves with the principles of good questionnaire design
- Identify common issues in questionnaires

Technology requirements

- A computer with an internet connection
- Text editor software (e.g. MS Word)

Questionnaire Designing Overview

The questionnaire can influence the response rate achieved in the survey, the quality of responses obtained, and consequently the conclusions drawn from the survey results. Questionnaire design should be started by considering the objectives of the survey and the required output and then devising a list of questions to accurately obtain this information.

Careful consideration should be given to a number of factors including the types of questions to be asked, the questionnaire wording, the structure and design of the questionnaire, and testing the questionnaire to ensure that quality data is collected. A poorly designed questionnaire can be the biggest source of non-sampling error (either directly or indirectly).

Steps for Questionnaire Development

This section lists the various steps involved in developing a questionnaire to ensure that the data items in the final questionnaire are appropriate and can be collected accurately.

Step 1: Defining the Objectives of the study

The first step in a questionnaire design is clarifying the survey objectives based on the study. The reasons for collecting the information must be clearly articulated. Defining the objectives should include:

- Clarifying the objectives of the survey;
- Justifying the collection in terms of the benefits;
- Determining the scope of the survey, i.e. who is to be surveyed;
- Determining the desired output, i.e. specify the tables according to the objectives and the precision required;
- Preparing a list of content, i.e. information needed according to the objectives. Several questions may be necessary to obtain the desired information;
- Defining the content;
- Justifying the content, i.e. is all the information collected necessary; and

- Establishing priorities for each data item. This is important in ensuring that the most important data items are collected. It also makes it easier to discard less important questions if the survey budget is reduced.

Step 2: Researching the Topic

The second step in questionnaire design is the researcher undertakes background research into the topic under consideration and should aim to:

- Clearly define the concepts and definitions to be used in the survey. The use of standard definitions and classifications will enhance data comparability; and
- Accurately identify the target population characteristics. This needs to be done so that questions can be pitched at an appropriate level
- It is also worthwhile looking at past surveys on the same topic to learn from past experience. Such collections can prove to be useful as it helps to avoid possible mistakes. It is important to look at the concepts, definitions, and question wording of past collections if a time series is to be created since changes in these will result in changes in responses. .

Step 3: Decide on Screening Questions (to select the respondents)

Screening questions (also known as "screeners") are used to either qualify or disqualify respondents from taking the survey depending on how they answer.

For the screening questions should be included a clear set of inclusion and exclusion criteria. Inclusion criteria may be based on demographics (e.g., females, based in Sydney, between the ages 18-25 years, and enrolled in a Business degree), attitudes (such as preferring to purchase locally-grown produce), lifestyle (spending weekends on the beach), and/or behavior (a regular purchaser of Nescafe coffee).

Example

Imagine you work for Nestle. You want feedback on a new blend of instant coffee. However, you only want to collect information from heavy users in Sydney. Your screening questionnaire could include questions such as:

- Where do you live? (NOTE: Stop the survey if the response is anything other than Sydney)

- Do you enjoy instant coffee? (If No, – or not sure or not applicable – then do not proceed with questions)
- On average, how much instant coffee would you have in a day? (Anyone with less than 4 cups will be screened out)

Step 4: Finalising the Questions and Type of Scales

Deciding on the content of the questions and the scale used to measure them will have an impact on data analysis. Note: All question content should be linked to the original objectives of the survey.

Questions types

Questions can generally be classified as one of two types which is open or closed depending on the amount of information that can be provided.

Open Questions

Open questions allow the respondents to answer the question in their own words. An example is 'What is your occupation?'

Advantage: The advantage of these types of questions is that they allow many possible answers and they can collect exact data from a variety of possible responses. However, they are more demanding than closed questions, both to answer and process.

Use: Open questions are often used in pilot tests to determine the range of likely responses.

Closed Questions

Closed questions provide respondents with a range of the most likely answers to choose from.

Advantage: The processing time of closed responses is much less than that of open-ended responses.

 Use: These questions are appropriate when the researcher can anticipate most of the responses and when exact values are not needed. However, they require more effort than open questions in the development and testing stages.

Table 1: Types of Closed Questions

Types of Closed Questions	Answer Format
Limited Choice	Yes/No
Multiple Choice	Choose from a number of responses
Checklist	Choose more than one of the responses from a given list
Partially Closed	Last alternative states 'Other, please specify'

The table below lists all the different types of questions that are used to collect different pieces of information from respondents.

Table 2: Types of Questions for Different Types of Information

Types of Questions	Information Sought
Factual Questions	Factual information, e.g., Do you have a driver's license?
Opinion Questions	Respondent's personal opinion towards, for instance, soft drinks
Behavioural Questions	Respondent's actions or undertaking an activity, e.g., have you travelled overseas this year?
Hypothetical Questions	Respondent's answers to hypothetical situations, e.g., what would you do if….
Demographic Questions	Respondent's personal information, such as gender, age, profession, postcode; Used for creating respondent segments
Knowledge Questions	Used to check respondents' knowledge about certain issues, e.g., who is the current PM of Australia?

Note: While the type of question relates to the information sought from the respondent, the way it is 'measured' (with appropriate scales) will make it feasible to carry out different types of statistical analyses. Below is an example that demonstrates how the four scales can be used to measure the same concept.

Assume, a marketer is interested in measuring people's ice cream-related attitudes and purchase behaviours. Below are some of the ways in which questions/scales could be drafted:

1. Have you purchased an ice cream product in the past few days? Yes_ No ___ (Nominal scale)

2. Assume you are making a shopping list. Place the following products from 1 to 4, where 1 = top priority and 4 = least priority on the list: (Ordinal Scale)

Products	1	2	3	4
Coffee				
Soft Drinks				
Ice cream				
Juice				
Chocolate				

3. On a scale of 1 to 5, where 1 = Strongly Disagree and 5 = Strongly Agree, please rate your level of agreement to the following items: (Interval Scale)

Products	Strongly disagree				Strongly agree
I love ice cream	1	2	3	4	5
I feel happy when I have an ice cream	1	2	3	4	5
I will go out of my way to purchase my favourite ice cream	1	2	3	4	5

4. D. How much did you spend on ice cream last week? $ _____ (Ratio scale)

Step 5: Check Question-Wording and Response Categories

There are a number of factors to consider when designing questions to ensure that appropriate answers are obtained. Several aspects of question design can introduce error, namely:

Language

Questions that employ complex or technical language or jargon can confuse or irritate respondents. In the case of interviewer-based surveys, respondents who do not understand the question may be unwilling to appear ignorant by asking the interviewer to explain the questions. The respondent may then either refuse to answer or give an inaccurate response.

Technical language or jargon should only be used in cases where it is part of the normal language of the survey's target population. An example of this case would be a survey of information technology specialists: the survey would need to use language that is 'jargon' to the survey designer, but appropriate for the respondent.

A general principle to keep in mind is that the wording of questionnaire items should be specific, definitive, consistent, brief, simple, and self-explanatory.

Ambiguity

If ambiguous words or phrases are included in a question, the meaning may be interpreted differently by different people. This will introduce errors in the data since different respondents will be virtually answering different questions.

For example, consider the question 'Has your standard of living decreased substantially because of a sharp increase in your monthly mortgage repayments?' A 'No' answer could mean any one of a number of things – for instance: 'No my standard of living has not dropped because of increased repayments' or 'No, my repayments have not increased'.

A question may also seem straightforward but allow for a variety of different kinds of answers. It is important to include the measurement unit you require wherever one applies, e.g. dollars, days, litres.

Double-Barrelled Questions (Multiple Concepts in one Question)

These are apparently single questions that actually incorporate two different questions. For example: 'Do you intend to leave work and return to full-time study this year?' A person may be intending to leave work, but not to return to study, and vice versa. When different parts of the question have different answers or parts of the question are not relevant, respondents may be unsure how to answer. When attempting to interpret answers to such questions, it can be unclear to which part of the question the answer corresponds.

Leading Questions

An error will be introduced if questions lead respondents towards a particular response. For example, the question 'How many days did you work last week?', if asked without first determining whether respondents did in fact work in the previous week, is a leading question. It implies that the person would have or should have been at work. Respondents may answer incorrectly to avoid telling the interviewer that they were not working.

Unbalanced Questions

Another form of leading questions is unbalanced questions. For example, 'Are you in favour of gun control?' provides only one alternative to consider. The question should be reworded to something like 'Do you favour gun control, or are you against gun control?', which gives respondents more than one alternative. The answer options of a question can also be unbalanced. For example, a respondent could be asked in a neutral way "Please rate your overall health" but required to select from the answers "Poor", "Good" and "Excellent".

Recall/Memory Error

A significant degree of error can be introduced in questions that require respondents to recall events, expenditure, etc., particularly if details are being sought for a long period. The quality of the data collected from recall questions is influenced by the importance of the event to the respondent and the length of time since the event took place. Respondents also tend to remember what should have been done rather than what was done.

Subjects that are of greater importance or interest to respondents, or events that happen infrequently, will be remembered over longer periods and more accurately. Where possible (eg. with financial information), questions should be framed so that respondents can refer to their own records which would enhance accurate reporting. Minimising the recall period also helps to reduce memory bias.

A specific type of memory error is telescoping. This occurs if respondents report events as occurring either earlier or later than they actually occur, incorrectly bringing events into the reference period. This effect is alleviated somewhat by being very specific about when the reference period begins and ends, for example using "the week ending Saturday 1st September" rather than "last week".

Intrusive (Sensitive) Questions

Questions on topics that respondents may see as embarrassing or highly sensitive can produce inaccurate answers. Respondents may refuse to provide information on personal issues such as health or income details. If respondents are required to answer questions with information that might seem socially undesirable, they may provide the interviewer with responses they believe are more 'acceptable'. In these cases, it is often better to provide the respondent with a self-administered questionnaire that the interviewer doesn't see.

Business survey respondents can also find some topics sensitive, such as IT security breaches or donations to charity, as well as not wanting to reveal commercial-in-confidence information about their business. Business surveys add a new dimension to collecting sensitive data as it is often necessary for different respondents, sometimes from different areas, to complete parts of the form and approve its content. Some respondents might not want others to see particular answers.

The negative effect of sensitive questions may be aggravated if they are placed at the beginning of the questionnaire and can therefore contribute to non-response if respondents are unwilling to continue with the remaining questions. If a sensitive question is further into a form the respondent is more committed to completion, and if they do refuse to continue, the partial response is more useful. Ways of overcoming difficulties associated with sensitive questions may include reassuring respondents

that the information they provide is confidential, and not requiring respondents to write their name anywhere on the survey form.

Acquiescence

This situation arises when respondents have a general tendency to agree rather than disagree with anything. It occurs when respondents are asked whether they agree or disagree with a statement, especially when the supplied statements are presented as plausible generalities. It can also appear for questions requiring a yes or no response.

This tendency can be due to a combination of factors, such as the personality and education level of respondents, as well as conditions of the interview or design of a self-completed questionnaire. Respondents will often agree when the question is ambiguous or otherwise difficult to answer. The effect may be exaggerated when the respondent is fatigued or has to answer a long string of questions with the same response categories. A related effect is satisficing, where respondents select the first reasonable answer rather than make the effort to find or remember the best answer.

Adequate Response Categories

It is important to make sure that there are adequate response categories and that they incorporate every possible response. For example:

Age: 15-19, 21-25

this provides a problem for those respondents whose age is 20.

Another problem that could arise is overlapping response categories. Ranges should always be mutually exclusive. For example:

Age 15-20, 20-25

this provides a problem for respondents whose age is 20 since they could respond in either or both categories.

Response categories also need to be worded carefully, as respondents will use them to clarify or extend the meaning of the question. For example, if a question using a frequency scale with five points "Never", "Rarely", "Average", "Often", and "Frequently" a respondent may incorrectly assume the scale represents the population distribution. If they consider themselves to be normal or extreme

compared to the population on the activity of interest their answers will differ regardless of the actual frequency they engage in the activity.

Number of Response Options

The number of response categories can influence the quality of the data as both too few and too many categories can cause errors. Too many can cause respondent fatigue and inattention, resulting in ill-considered answers. If there are too few categories respondents may have difficulty finding one which accurately describes their situation.

Don't Know Category

The decision about whether to include or exclude a Don't Know option depends to a large extent on the subject matter. The remaining responses are usually evenly distributed on the negative and positive sides of a scale if this category is excluded, although it depends to a large extent on the nature of the question. Excluding this option may not be a good idea, as respondents may be forced to give an answer when, for example, they really do not know what their attitude is to a particular subject, or they do not know the answer to a factual question that has been asked. When respondents are forced to develop an attitude on the spot this attitude will be highly unreliable.

Tone

A change in wording can result in a change in responses. For example, different responses may be obtained through using the following two questions:
'Do you think that gun ownership should be forbidden?' or
'Do you think that gun ownership should not be allowed?'

Minor changes in wording can also have a significant effect on responses. One should therefore be careful when looking at alternative wordings. The use of negative words like "not" should be avoided in questions as they are easily missed by respondents. In addition, using "not" in a scale such as "Satisfied", "Neither" and "Not satisfied" doesn't provide a true opposite. "Dissatisfied" would be a better alternative, however "Unsatisfied" could also be used and would mean something slightly different to respondents.

Step 6: Finalise the Structure and Layout of the Questionnaire

Not only does the wording of questions require attention to detail, but also the 'look' of the questionnaire. Poorly designed questionnaires (eg. hard-to-read text) not only serve as a disincentive to respondents completing the questionnaire but can also result in respondents making errors. Some of the important elements of questionnaire structure and layout are outlined below.

Sequencing

The questions on a form should follow a sequence that is logical to the respondents. Regardless of the method used to administer the questionnaire, the sequence should flow smoothly from one question to the next. A smooth progression through the questions is particularly important if the questionnaire is answered in difficult circumstances (e.g. a mother trying to fill in a questionnaire while her children are seeking her attention). It is a good idea to start the questionnaire with pleasant and easy questions to promote interest in the survey, and to give respondents confidence in their ability to answer the remaining questions. In particular, the opening questions should establish that the respondent is a member of the survey population.

The remaining questions should be logically structured so that the interviewer or respondent does not need to alternate between pages of the questionnaire. For example, any explanatory notes should be presented as part of the question they refer to, not on a separate page.

Questions that may be sensitive to respondents should generally not be placed at the beginning of a questionnaire. Rather, they should be placed in a section of the form where they are most meaningful to the context of other questions. In this way, the format of the questionnaire can act as a buffer to help the respondent feel more comfortable with sensitive questions after establishing rapport.

In self-enumeration questionnaires, to ensure that respondents answer only those parts of the questionnaire that are relevant, filter questions may be used to direct respondents to skip the questions that do not apply to them. Filter questions are also used in interviewer-based surveys to direct interviewers to follow a series of

questions according to answers given by respondents. Filter questions need to be used with care as respondents (and interviewers) need to have sufficient information about the skip condition to judge whether the respondent should skip. Filters should also generally be avoided for sensitive topics as respondents will tend to give the answer that avoids answering the sensitive questions.

If the instructions are not clear and straightforward, interviewers or respondents can follow an incorrect sequence or miss questions. In general, only one or two conditions should be placed in each sequence guide. Computer-assisted interviewing and electronic self-completion forms can make complex sequencing much easier.

Filter questions also identify sub-populations. For example:

Q7 'Were you born overseas?'

If 'Yes' go to Q8,

if 'No' go to Q12.

Order of Questions

The order in which the questions appear may influence the responses given to particular questions. Responses given to earlier questions can influence responses to later questions. For example, if a question asks participants whether they believe trade unions are disruptive in the community, and then a later question asks about problems in Australian industry, the negative influence of trade unions on industry may receive much more attention than would otherwise have been the case.

Order of Response Options

The actual order of response options can also introduce bias. The options presented first may be selected because they make an initial impact on respondents, or because respondents lose concentration and do not hear or read the remaining options. Equally, the last options may be chosen because they are more easily recalled, particularly if respondents are given a long list of options. Thus, the order of response options has a greater effect on data quality when a question includes a large number of response options.

If possible, options should be presented in a meaningful order. If some options are more socially desirable than others these should go last to reduce bias. For example, an education question should present the qualifications in order from lowest to highest. For some self-completed lists, alphabetical order is the most appropriate to help the respondent find which option they want, for example, if respondents have to select which crops they produce.

Response Options and Respondent Difficulties

When the survey is interviewer-based, the response options can be presented either verbally or on a prompt card. A prompt card is a list of possible responses to a question that are shown by the interviewer to assist the respondents. This helps to decrease errors resulting from respondents being unable to remember all the options read out to them. However, respondents with poor eyesight, migrants with limited English, or adults with literacy problems will experience difficulties in answering accurately.

Length

The length of a questionnaire can be described in different ways. Survey designers tend to worry about number of pages, whereas the number of questions (especially mandatory ones) and the time taken to complete are usually more important. How long is too long varies across mode of data collection, the ease and interest of the topic and the design of the questionnaire. Towards the end of a long questionnaire, respondents may give less thought to their answers and concentrate less on the instructions and questions, thereby decreasing the accuracy of the information they provide. If a respondent is told an interview will last several hours, or they receive a questionnaire that is many pages thick, that can lead the respondent to refuse to participate at all.

Questionnaire Layout

Respondents or interviewers using a questionnaire with poor layout can miss questions, follow an incorrect sequence or enter responses in the wrong response box, which will result in missing or incorrect data. Poor layout can also contribute to errors at the processing stage. For example, if response boxes are not aligned some answers may be missed completely during the data entry.

Particularly for those questionnaires which are completed by respondents, the design may contribute to errors as a result of:

1. poor legibility (e.g. unclear printing or very small text);
2. violating the normal reading path of the respondent (English readers expect to read from top left to the bottom right and e.g. big headings and bright pictures in the middle of pages disrupt this);
3. instructions which can be easily overlooked (e.g. those which are not clearly differentiated from the questions or are not placed near the relevant part of the question); and
4. Inadequate space for answers.

Physical Design

The questionnaire should be physically set out so as to minimise the time needed to interview, respond and process the results. Specifically, consideration should be given to the form's construction, graphics, and layout. Poor layout leads to mistakes in understanding questions and recording the responses. In general, the questionnaire:

1. Needs to be understood by respondents, interviewers, and processors. This is done by providing clear instructions. For respondents, this means an adequate layout of questions and response categories with appropriate sequencing. Interviewers require prompts to be clearly understood and response codes need to be adequate for processors;
2. Should have a good appearance as it might affect the response, i.e. The questionnaire should be well designed and presented and therefore easy to answer;
3. Should clearly identify the date, title, and the organisation;
4. Should clearly outline the purpose of the survey;
5. Should assure respondents about the confidentiality of the information they are providing;
6. Should provide a contact number so that respondents can obtain help if they require it and a due date; and
7. Should have pages that are numbered consecutively, with a simple numbering system.

Step 7: Testing the Questionnaire

Testing intent to measure the understanding of concepts and definitions has been investigated through small groups. The rough questionnaire can be produced and tested informally on a small group of people, perhaps one's colleagues at work. Such testing is not intended to obtain representative results but aims to find out the major flaws with the questions, for example, awkward wording. The questions can be restructured and developed into a draft questionnaire which can be used in rounds of informal pretesting and later pilot testing.

Questionnaire design begins by clarifying the objectives of the survey, determining the data which is to be produced by the survey and devising a list of questions to obtain this data. Careful consideration should be given to a number of factors, including the type of questions to be used, the logical sequence and wording of questions, and the physical design of the form. It is important to test each of these aspects of the questionnaire design with a group of respondents before finalising the questionnaire. If necessary, the form can then be modified and retested until respondents can complete it accurately and quickly with a minimum of errors.

Key Takeaways

- Brainstorming and consulting the literature are important steps during the early stages of preparing to write effective survey questions.
- Make sure your survey questions will be relevant to all respondents and that you use filter questions when necessary.
- Getting feedback on your survey questions is a crucial step in the process of designing a survey.
- When choosing response options, keep in mind that the problems of fence-sitting and floating are interrelated: the solution to one problem may be the cause of the other.
- Pretesting is an important step to improve a survey before administering the finalized version.

Glossary

- Closed-ended question: A question for which the researcher offers response options

- Double-barreled question: A question that asks two different questions at the same time, making it difficult to respond accurately

- Fence-sitters: Respondents who choose neutral response options, even if they have an opinion

- Filter question: A question that identifies some subset of survey respondents who are asked additional questions that are not relevant to the entire sample

- Floaters: Respondents that choose a substantive answer to a question when they don't understand the question or don't have an opinion

- Matrix question: Lists questions in sets based on answer category or response option

- Open-ended questions: Questions for which the researcher does not include response options, allowing respondents to answer the question in their own words

References

1. Australian Bureau of Statistics n.d., *Questionnaire design,* viewed 3 March 2022, <https://www.abs.gov.au/websitedbs/D3310114.nsf/home/Basic+Survey+Design +-+Questionnaire+Design>.

2. Babbie, E. (2010). The practice of social research (12th ed.). Belmont, CA: Wadsworth;

3. Dillman, D. A. (2000). Mail and Internet surveys: The tailored design method (2nd ed.). New York, NY: Wiley;

4. https://westernsydney.pressbooks.pub/customerinsights/chapter/chapter-10-questionnaire-design/.

5. Neuman, W. L. (2003). *Social research methods: Qualitative and quantitative approaches* (5th ed.). Boston, MA: Pearson.