

Surveys

Surveys may be used for descriptive, explanatory, and exploratory purposes. They are chiefly used in studies that have individual people as the units of analysis. Survey research is probably the best method available for describing a population too large to observe directly. Surveys are also excellent vehicles for measuring attitudes and orientations in a large population. Careful probability sampling provides a group of respondents whose characteristics may be taken to reflect those of the larger population, and carefully constructed standardized questionnaires provide data in the same form for all respondents.

Levels of measurement

In surveys, variables are operationalized in the form of questions. The kind of analysis you can do with your variables is first affected by their level of measurement. Put simply, measurement is the description of a characteristic of observed units (e.g., people) through numbers, and it always implies an act of differentiating and classifying units. There are four levels of measurement -- nominal, ordinal, interval, and ratio. Each level of measurement implies a different way in which observed units are distinguished and classified. As a consequence, levels of measurement determine the kind of mathematical operations a variable is amenable to, and therefore they have different limitations and advantages for your analysis.

Nominal measures (also called qualitative measures) are derived from questions whose possible responses form a set of mutually exclusive and exhaustive categories that have no inherent ranking. A typical example is the marital status question:

- What is your marital status?
- 1 - Married
 - 2 - Widowed
 - 3 - Divorced/separated
 - 4 - Never married

The numbers are merely placeholders that represent a response category. They do not have an inherent meaning because there is no meaningful rank order of the categories; "married" is not greater or less than "widowed." Nominal data are typically analyzed using frequencies, the number and proportion of the respondents that chose each response category. The relationship between nominal variables is usually analyzed using cross-tabulations with a significance test, such as a chi-square test, which indicates how likely it is that the cross-tabulation frequencies in the table and the relationship they indicate between the variables are merely due to chance.

Ordinal measures (also called rank) have the same qualities as nominal measures, with the added attribute that the numbers representing the data do have rank order. Ordinal and nominal variables are also often called "categorical." Ordinal questions ask the respondent to rank something about them. An example ordinal question is:

- Do you agree that your HIV treatment is effective?
- 1 - I strongly agree
 - 2 - I agree
 - 3 - I neither agree nor disagree
 - 4 - I disagree
 - 5 - I strongly disagree

Typically, researchers analyze ordinal data using frequencies and cross-tabulations as well. Because ordinal data share the same qualities as nominal data, this kind of analysis is fine. There is also a set of statistical analyses

designed specifically for ordinal data in a cross-tabulation, such as Kendall's tau coefficient, a measure of the association between two ordinal variables.

Interval measures have the same qualities as nominal and ordinal data, with the added characteristics that the distance between two consecutive numbers is meaningful and equal. As a consequence, you can subtract numbers in an interval measure. A clear example of this is the temperature in Fahrenheit degrees. The distance between 91°F and 90°F is 1°F, the same as the difference between 41°F and 40°F. Subtractions are meaningful, so you can say the decrease in temperature is 1. Therefore, while with ordinal measures we can only rank observations, with interval scales we can both rank and quantify the magnitude of difference between two observations. Unlike ratio measures, however, interval scales have no true zero. The zero in interval measures is arbitrarily defined, and it does not indicate the true absence of a quantity. For example, 0 does not mean an absence of heat. As such, ratio and proportions are not meaningful with interval measures. It is not meaningful to state that 40°F is half as hot as 80°F.

Ratio measures share all the characteristics of nominal, ordinal, and interval data, with the added characteristic that a real zero point exists, which indicates the absence of a quantity. Ratio and interval variables are also often called "continuous." Spatial distance, age, and income are examples of ratio measures.

Guidelines for asking questions

Several guidelines can help to frame and ask questions that serve as appropriate operationalizations of variables while avoiding pitfalls that can result in useless or even misleading information.

1. Make sure the question is valid

Does the question measure what you think it measures? For example, asking respondents how many visits they made to the doctor this year is not a valid measure of health seeking behavior because there are forms of healthcare access and other forms of healthcare providers. Your questions must measure the concept you have in mind as closely as possible.

2. Choose appropriate question forms

Questions and statements: Variables can be operationalized in the form of a question or a statement. Often a researcher is interested in determining the extent to which respondents hold a particular attitude or perspective. If you can summarize the attitudes in a fairly brief statement, you can present that statement and ask respondents whether they agree or disagree with it. The Likert scale is one approach to measuring that attitude or opinion, a format in which respondents are asked to strongly agree, agree, disagree, or strongly disagree. Using both questions and statements offers flexibility in the design of items and can make the survey more interesting.

Open-ended and closed-ended

Open-ended questions allow the respondent to provide her own answer. For example, the respondent may be asked, "What do you feel is the most important issue facing healthcare delivery today?" and be provided with a space to write in the answer. Responses must be coded before they can be computer analyzed.

Close-ended questions provide a list of answers for the respondent to select from. Close-ended questions are more popular in survey research as they create uniformity in the responses and are more easily processed than open-ended ones. However, researchers must be sure that the question posed is clear and that the response list provided is relevant, exhaustive, and mutually exclusive (for example, if providing income ranges there should not be any overlaps).

3. Make items clear

Questions must be clear and unambiguous. Often we become so deeply involved in the topic under examination that opinions and perspectives are clear to us but not to someone who is only just now

considering them. Be careful not to make questions too long or wordy, and you should avoid jargon that might be unknown to respondents. Ideal survey questions are just a single sentence.

4. Avoid double-barreled questions

Try not to mix more than one concept in your question. For example, "Please rate your satisfaction with the amount and kind of care you received while you were in the hospital." You don't really know what the respondent is rating. As a general rule, whenever the word "and" appears in a question or statement, check whether you're asking a double-barreled question.

5. Avoid leading questions

Leading questions hint to the respondent that they should answer in a particular way. You want to know their true responses, not mirroring your own opinions and not a reflection of what you believe are the attitudes, behaviors, and conditions of that population. Also, try to avoid constructing questions to be "politically correct." Survey questionnaires are an instrument of measurement, not a testament to your beliefs.

6. Don't ask for information that the respondent can't reasonably know

Be careful not to put respondents in a position of answering unreasonable questions. For example, behaviors that occurred over a long period of time "How many times did you eat fish in the last year?", or behaviors that occurred too long ago "How often did you go to the doctor during your first pregnancy?", or financial questions that they may not have accurate answers to "How much money could you save each month, your average income minus your average expenses, last year?" Also, be wary of asking respondents about their opinions about a current event or debate without first finding out if they are familiar with it, and possibly asking them to rate their level of familiarity.

7. Avoid negative items

Negation in a question is easily misinterpreted. For example, "the WHO should not have identified the Ebola outbreaks as an epidemic crisis any earlier than it did." Many respondents will read over the word "not" and answer on that basis. Thus, some will agree with the statement when they are in favor of the WHO's actions, others will agree when they are opposed to it. And you may never know which are which.

8. Include a "Don't know" option

Most questions show allow the respondent to reply, "Don't know" or "Refuse." Sometimes, respondents simply don't understand a question. Allowing them to answer, "Don't know," can be very informative, letting you know they don't understand a concept well enough to answer. Similarly, some respondents don't want to answer certain questions, such as their age and income. Most ethics committees require you to let the respondent refuse to answer questions they don't want to answer.

9. Use skip logic to reduce the burden on respondents

Skip logic allows respondents to skip questions that are irrelevant based on previous answers. For example, a respondent without children shouldn't be asked questions about the age of those children. It prevents respondents from providing answers to questions that do not pertain to them. Once your data are collected and you are working with them in a statistical package, it becomes difficult to sort out this kind of mistake.

Survey construction

Improperly laid out surveys can lead respondents to miss questions, confuse them about the nature of the data desired and even lead them to throw the survey away.

Clear instructions

Start with clear instructions, whether the intention is that they are filled out by respondents or interviewers. Although many people these days have experience with forms and questionnaires, begin by telling them exactly what you want: that they are to indicate their answers to certain questions by placing a check mark or an X in the box beside the appropriate answer, by circling the selected response, or by writing in their answer when asked to do so. Some questions may require special instructions to facilitate proper answering, such as ranking a list of possible options, selecting just one option from a list, or selecting all applicable options. If many open-ended questions are used, respondents should be given some guidelines about whether brief or lengthy answers are expected. If you wish to encourage your respondents to elaborate on their responses to closed-ended questions, that should be noted. Between sections, offer a statement about what you want from the next series of questions. For example, "In this section, we would like to know about your experience with healthcare providers." Or for the demographics section you might say, "We would like to know just a little about you so we can see how different types of people feel about the issues we have been examining." Short introductions like these help the respondent make sense of the survey. They make the survey seem less chaotic, especially when it taps a variety of data. And they help put the respondent in the proper frame of mind for answering questions.

Order of questions

The order of questions does not uniformly impact respondents. Some people are bothered by the order of questions, others are not. It is important to test your survey before you use it, and consider the order of questions as impacting responses. Also consider that a written survey isn't the same as a structured interview. In an interview it is best ask some easy questions first to get momentum going, such as demographics. These questions are not threatening and build rapport and ease. But don't get the respondent into a routine of quick answers if you are looking for more depth. Quickly transition to the most interesting set of items to capture the respondents' attention and get them committed to the task of the survey. For a written survey, better to put the demographics at the end rather than the beginning as they give the appearance of a routine form, and diminish the motivation of respondents.

Format

As a general rule, a survey should be spread out and uncluttered. Don't try to squeeze all your questions together because you fear that the survey will look too long. Better to spread things out so that people don't miss questions and feel success in moving quickly through the pages.