Asking the Right Questions: Designing Surveys to Produce Valid and Reliable Results

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ABSTRACT

Writing questions that produce accurate, reliable and valid assessments of conditions and opinions is critical for any survey. This is not easy. Not only are both the wording and structure of questions important, but also any subtle relationships between questions that could impact how the respondent feels about these questions. Additionally, each of the questions must produce discriminating answers, be unbiased and provide information that serves the goal of the survey. Ideally questions should be pretested to assess reliability and validity but many times today, surveyors do not have either the time or the budget for rigid pre-assessment. This paper provides a checklist for writing survey questions on the fly that can produce the needed results.

INTRODUCTION

People are often told that they can't get the answer if they don't ask the question. But any answer is not enough. While a question can result in an answer, a good question is far more likely to result in an accurate, meaningful answer. As journalist Warren Berger said, "We are all hungry for better answers. But first, we need to learn how to ask the right questions." A well-designed survey with properly constructed questions can help you collect meaningful, usable answers.

The Cambridge Dictionary defines a survey as "a set of questions people are asked to gather information or find out their opinions, or the information gathered by asking many people the same questions:" In other words a survey is nothing more than questions administered to a group of people. For most of us in analytics, a survey gains importance. Here it is more narrowly a research technique used to collect primary data from survey respondents where the data collected will answer questions upon which future decisions will be based. Accurate knowledge gained from the survey about whatever factors are involved is essential to good and appropriate decision-making.

There are many factors involved in the development of an effective survey plan. There needs to be a stated purpose for the survey and everything that follows should serve that purpose. The survey has to target and reach the correct respondents. Sample size needs to be appropriate. The selected method of survey administration needs to yield the best data. The collected information needs to be secure. Data needs to be collected in a format that can be accessed and analyzed. Data analysis techniques need to be appropriate for the data collected. These are all topics for other papers and presentations.

For the purposes of this paper the method of collection will be limited to the questionnaire. While questionnaires are likely older than the 19th century, the first known written questionnaire was administered in 1838 by the Statistical Society of London to record industrial and social conditions. Other survey methods were more common prior to this, especially after the formation of statistics as a science in the late 18th century. Written questionnaires, however, imply literacy among the respondents and literacy of other than upper classes was not widespread until the expansion of education in the last half of the 19th century.

While questionnaires made data collection easier, the results of a questionnaire based survey are worthless if the questionnaire is written inadequately. Bad decisions resulting from faulty data not only can result in huge monetary losses but can also negatively impact the lives of many. While not comprehensive, this paper provides guidance on avoiding common survey question writing pitfalls.

OVERALL QUESTION DESIGN GUIDELINES

There are always going to be pitfalls with data collected by survey. Without rigid pre-assessment, (and even with pre-assessment) it is impossible to identify the subtleties of words across unique cultures and contexts. Self-reports are never totally accurate. Non-response will always be a problem.

Here are some general rules that apply across survey questions.

1. <u>State an unbiased purpose for your survey</u>. Calling something a 'satisfaction survey' tells the respondents you want them to say they were satisfied. Let them rate their experience, not their satisfaction. While it is impossible to totally eliminate social desirability bias or the tendency to respond with the desired answer, the more neutral the context the better.

2. <u>Keep your survey short</u>. Only ask questions that you will use the answers to. Just because you find something interesting to know or that someday in the future this *might* be useful information, doesn't mean it should be part of the survey. Survey fatigue is a real thing. Every product, company and service representative wants feedback today.

3. <u>Ask respondents for information that is not available through other sources</u>. If the question can be answered by linking with a readily available database it should not be in your survey. Also, if you already have the respondent's demographics, don't ask it again in the survey.

4. <u>Only ask questions that the respondents already have enough knowledge to answer</u>. An online lesson on survey questions (Pew Research) suggests that surveyors can provide enough background information in each question so that respondents can answer. But do you really want to base decisions on someone who's only information on the topic is a sentence in the question? This is especially important when lives and resources are at stake.

5. <u>Be strategic about the order of questions</u>. The general rule is least sensitive to most sensitive. If a respondent is already comfortable answering questions, they are more likely to answer and be honest about sensitive questions. But this does NOT mean to add extra questions to make the respondent comfortable.

SURVEY QUESTION PITFALLS

The questions themselves, if not carefully written, can be misinterpreted, confuse the respondent or provide invalid responses. By the 1950s, researchers had discovered that changes in wording produced very significant differences in the results. For a survey to be valid all respondents needed to comprehend, process and interpret the questions and response options in the same way.

This section includes the most common pitfalls to be avoided in surveys. The pitfall examples of the question pitfalls are taken from current surveys. See the list of references for pitfalls following the general references at the end of this paper. Some of the questions/answers have been abbreviated for space.

1. LEADING QUESTIONS

A leading question is a question that includes a bias or a presupposition that encourage respondents to respond in a certain way. The propensity to social desirability mentioned above increases the sway of biased questions. In this example below, the questioner puts the idea in the mind of the respondent that specific spending categories lead to a fiscal gap for the state.

Display 1. Leading Question Example with Solution.

2. MULTI-SUBJECT QUESTIONS

Only one question should be asked at a time. Multi-subject or double-barreled questions are not only difficult for respondents to answer, but the responses are difficult to interpret. It is implied that outcomes and results are always aligned and in opposition to both time and processes. Unless there is a single manager, the term 'management' also violates this principal as management often doesn't speak with a single voice.

Managerial implications	My immediate manager's focus is on outcomes.
1. Management's main focus is on outcomes and results rather than the time and processes involved in order to complete a task.	1.
Strongly Agree / Agree / Disagree / Strongly Disagree	Strongly Agree / Agree / Disagree / Strongly Disagree

Display 2. Multi-Subject Survey Question Example with Possible Solution.

3. QUESTIONS USING JARGON

Survey questions should avoid technical jargon unless the language is part of the daily activities of the group being surveyed. Questions should be to the point and easy to understand. It is important that all respondents interpret the questions the same way. If the question below was given to Human Resources employees, the use of FTE without explanation would be valid, but not across a general population.

What is the scope of your employment in FTE (rounded)?	What percent (%) of full time are you employed?
0 0,1 FTE	○ 10 %
0 0,2 FTE	○ 20 %
0 0,3 FTE	○ 30 %
0 0,4 FTE	○ 40 %
0 0,5 FTE	○ 50 %
0 0,6 FTE	○ 60 %
0 0,7 FTE	○ 70%
0 0,8 FTE	○ 80 %
0 0,9 FTE	○ 90 %
0 1 FTE	○ I am a full-time employee.

Display 3. Jargon Survey Question Example with Possible Solution.

4. QUESTIONS USING VAGUE QUALIFIERS

Questions and/or responses should not leave room for interpretation, but often survey takers are left to guess what the question writer meant or to default to whatever answer seems to make the most sense to them. In the example below, the term 'family' is ambiguous. A good question needs to mean the same thing to every respondent.

1. How many members are in your family? _____	1. How many people reside with you in your household? _____

Display 4. Vague Qualifier Question Example with Possible Solution.

5. LEADING RESPONSES

Bias can also be present in the response selection for a survey question. This can be present in two very different ways. Easiest to spot would be those where the response choice implies positivity, e.g. I care about others. But more prevalent and less easy to spot are those questions where, instead of a balanced scale, 3 out of 5 or even 4 out of 6 possible responses are positive. In the example below, only one of the four responses indicates any negativity.

Display 5. Subtle Leading Response Question Example with Solution.

6. NON-EXCLUSIVE RESPONSES

Many surveys ask respondents to pick one when multiple responses might be true. That type of error can be fixed with the ability to select multiple answers. Also problematic are ranges when one range lists an ending value that is the beginning value of the next range as illustrated below.

Display 6. Non-Exclusive Response Question Example with Solution.

7. NON-EXHAUSTIVE RESPONSES

What is meant by non-exhaustive is that the responses do not cover all possible answers. The survey question below doesn't allow for the person who eats meat but less often than once a week. Vegans and pescatarians might not want to categorize as vegetarian.

Display 7. Non-exhaustive Response Question Example with Solution.

8. RESPONSE TYPE DOESN'T MATCH QUESTION

In a good survey, answer options need to match the question. In this example, the question is a Yes/No question but the answer is not. This pitfall is less likely to result in invalid responses than many others. In the example below, if the yes/no response was desired by the surveyor yes/no could be derived from the response choices. But it is much better to reword so that what is expected is clear to the respondent.

Display 8. Response Type Mismatch Example with Solution.

9. RESPONSE CHOICES NOT CONSISTENT

Consistency should be important in question design. If the right hand of a scale is positive, it should stay positive throughout. Questionnaire designers often mistakenly think it is a good idea to throw in a negative perspective in the midst of positives to test if a person is reading the questions. But today many people speed read. And they react to patterns and see what they expect to see rather than what is there. Additionally, studies have shown people are more likely to scan than read word for word. This causes valid responses to be thrown out because the respondent answered what he/she expected to see in the question. Note: the example below also violates the neutral question concept.

MICROSOFT NEWS POLL	MICROSOFT NEWS POLL
Rate how accurately (or inaccurately) each statement below describes you.	**Rate how accurately (or inaccurately) each statement below describes you.**
Very Inaccurate / Somewhat Inaccurate / Not Accurate or Inaccurate / Somewhat Accurate / Very Accurate	Very Inaccurate / Somewhat Inaccurate / Not Accurate or Inaccurate / Somewhat Accurate / Very Accurate
I believe in the importance of art.	**I believe in the importance of art.**
I tend to vote for liberal political candidates.	**I tend to vote for liberal political candidates.**
I enjoy hearing new ideas.	**I enjoy hearing new ideas.**
I am interested in abstract ideas.	**I am interested in abstract ideas.**
I do not enjoy going to art museums.	**I enjoy going to art museums.**

Display 9. Response Form Inconsistency Example with Solution.

10. QUESTION TOO LONG

Survey question fatigue will present itself much quicker if questions are too long and take careful reading to understand. Using simple language and a single concept at a time can usually prevent this. If examples are needed for the question to be understood, the question is not well written. As a general rule questions should not be greater than 20 words in length. In the example below, adding unnecessary legalese to the question made the question require explanation.

An exception to the 'short question' rule does exist when respondents need to recall information that isn't easy to remember. In this instance, a context or short explanation can assist with the memory.

11) Under the agreement between your agency and the service provider, does the provider create transit schedules for any services OTHER THAN those operated by the service provider? For example, the service provider could create schedules for your transit agency's bus and rail services, but the service provider only operates bus services. ( ) Yes – for what other transit services does the service provider create schedules? _____ ( ) No	**11) Does your agency's transit scheduler provide transit schedules for any other services?** ( ) Yes – for what other transit services does the service provider create schedules? _____ ( ) No

Display 10. Question Too Long Example with Solution.

QUESTION CHECKLIST

As illustrated above, a good survey starts with good questions. While the perfect survey includes rigid pre-testing of the questions (and taking place in a closed environment), usable and valid results can be obtained when writing questions with care. Here is a summary checklist.

- ☐ No unnecessary questions.
- ☐ Neutral language.
- ☐ Single subject per question.
- ☐ Concise, clear questions.
- ☐ No jargon.
- ☐ No vague qualifiers.
- ☐ Balanced answers.
- ☐ Exhaustive answers.
- ☐ Mutually exclusive answers.

CONCLUSION

The survey is a useful and convenient tool for data collection and is often conducted through questionnaires. Designing a questionnaire requires attention to many factors that can determine the validity of the outcome; the questions themselves are of prime importance. How the questions are positioned and asked is crucial. Therefore, creating a valid survey is not just a matter of listing the questions that surveyors want answered, especially when crucial decisions are dependent on this data. With today's necessity or perceived necessity for speed over rigorous testing of questions, surveyors must rely on the lessons learned from past scientific research when crafting survey questions. Without questions that follow these rules, your survey will not collect valid and reliable results.

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