

Planning your Survey

A Brief Primer on Strategies and Approaches

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What is a survey questionnaire?

- Survey questionnaires present a set of questions to a subject who with his or her responses will provide data to a researcher.
- On the surface, it seems a fairly simple task to write a set of questions to collect information,
- However many pitfalls that should be avoided to develop a good survey questionnaire.
- The focus here is on describing some of the key elements in designing a survey questionnaire, and then suggesting some tips and ideas for creating a good survey questionnaire

Survey 101

- All worthwhile research begins with a good question
- A clear research question leads to identifying sources of evidence to answer the question
- Surveys are one method to gather evidence
 - Perceptions
 - Beliefs
 - Attitudes
 - Behaviors
- Survey design is a craft
 - *"If you haven't studied it, you don't know how to write a survey well, and the data you get is (sic) garbage" –Portugal, S. (2007)*
 - Surveys are primarily quantitative tools for gathering research evidence
 - Surveys require some basic mathematics to plan (e.g. what does your sample size need to be to ensure that your results are valid?)

Levels of Measurement

- Type of data gathered must be useful for eventual quantitative and qualitative analysis
- Affects coding and forms of statistical analysis available for use
- Levels of Measurement
 - Nominal
 - Non-numeric, used to identify rather than measure e.g. male or female
 - Ordinal
 - Gather factual information and respondent opinion
 - Indicates a rank order relationship among the response categories
 - However, does not reveal how much difference there is between the categories (e.g., I will teach: (1) fewer (2) the same (3) more classes next year)
 - Although there is mathematical or ordered relationship, cannot assume equal differences between the categories such as “same” and “more”

Levels of Measurement

- Likert (or Likert-type) scales
 - Most widely used ordinal scale among survey researchers
 - Used primarily for assessing opinions
 - Usually composed of five or more response categories
 - E.g., “More writing courses are needed in higher education- (1) Strongly agree, (2)agree, (3)undecided, (4)disagree, (5)strongly disagree
 - Other Likert response examples: Very good to very poor, Very satisfied-very unsatisfied, Very important to very unimportant

Levels of Measurement

- Interval or Ratio Scales
 - Most sophisticated and statistically robust scale in survey research
 - Rank-order relationship with equal differences between categories
 - E.g., income level, age, height, weight, classroom size

Quiz

- What type of data are gathered by the following questions?
 - 1. Your age group is:
 - (1) 19 and under
 - (2) 20-24
 - (3) 25-29
 - (4) 30-34
 - (5) 35-39
 - (6) 40-44
 - (7) 45-49
 - (8) 50-54
 - (9) 55-59
 - (10) 60 or over

Quiz (continued)

- I believe that co-curricular activities in high school are:
 - Very important
 - Important
 - Undecided
 - Unimportant
 - Very unimportant

Quiz (continued)

- Your age group is
 - (1) Adolescent
 - (2) Adult
 - (3) Middle Age
 - (4) Retirement Age
- Were you born between the years of 1965 and 1985?
 - Yes
 - No

Objectives

- The key to developing a good survey questionnaire is :
 - Keep it short while ensuring that you capture all of the information that you need. (This is not an easy task).
 - Before you begin to design your survey questionnaire, you should develop a set of objectives for your research
 - List the information that you are trying to capture. This list of objectives and research goals will serve as your plan for the survey questionnaire.
- Once you know what you are looking for, you can begin to structure the questions that will help you capture the information.
- With completed draft survey questionnaire, you can use your objectives to review the questions and determine if each of the questions is providing you with information that you need.
- **Any question that is not providing necessary information should be removed.**

Types of Questions

- Structured or fixed response question
- Partially-structured question
- Non-structured or open question
- It is important to understand when and how to use these questions when designing your survey

Structured Questions

- Structured questions are questions that offer the respondent a closed set of responses from which to choose
- Structured questions make data collection and analysis much simpler and they take less time to answer
- Structured questions are best suited in the following situations:
 - (1) when you have a thorough understanding of the responses so that you can appropriately develop the answer choices
 - (2) when you are *not* trying to capture new ideas or thoughts from the respondent

Examples

■ Do you have a driver's license?

Yes

No

Which subject do you enjoy the most at school?

Math

Science

English

Foreign Language

History

Government

Art / Music

Other

How many hours a day do you spend doing homework?

0 to 1 hour

2 to 3 hours

4 to 5 hours

more than 5 hours

Structured Question

- When writing the selection of responses for a structured question, you should make certain that the list covers *all possible alternatives* that the respondent might select AND
- That *each of the answers is unique* (i.e. they do not overlap)
- Generally, including catch-all responses (such as "Other", "Don't know", "None of the above", etc..) at the end of a list of answer choices will help to ensure that the data you are collecting will be accurate
 - In the previous example, since the selection of non-required courses varies dramatically from school to school the option of "Other" helps to ensure that you are capturing the responses that do not fit into the broader subject areas already listed, rather than forcing respondents to select one of the other subject areas
 - **In general however, best to use the "Don't know" option sparingly.** Try to ensure that your respondents are capable of answering the majority of the questions on your survey questionnaire

Consistency

- Very important in writing the list of responses
- All of the responses should be similar so that no single response stands out to the individual except the answer that is true for them
- Consistency simply helps to ensure that you are not leading respondents to a particular answer by making that answer different from the others
- Easier for respondents to find the answer that is relevant to them. Here's an example using the homework question you have already seen above:
- **Example of a Bad Question with Inconsistent Answer Choices**
- How many hours a day do you spend doing homework?
 - 0 to 1 hour
 - 120 to 180 minutes
 - 4 to 5 hours
 - more than 5 hours

Rating Question

- Used to capture varying degrees of emotion about a subject, it is best to use either a rating or a ranking question.
- A rating question asks respondents to explain the degree with which they feel about a certain topic, subject, event, etc... For example:

- **Example of a Rating Question**

Please describe how you felt about the Homecoming Pep Rally

(1)Unsatisfied

(2)Somewhat Satisfied

(3) Satisfied

(4)Very Satisfied

(5)Extremely Satisfied

Ranking Questions

- **Example:** Please rank the following Homecoming activities in order of preference (starting with 1 for your favorite activity).

___ Homecoming Pep Rally
___ Homecoming Parade
___ Homecoming Football Game
___ Homecoming Dance

- A ranking asks respondents to list their responses in order of preference.
- A ranking question asks respondents to explain how they feel about something by comparing it to other items in a list
- **In general, if you are trying to get a respondent's opinion, it is best to have them do a rating rather than a ranking.**
- This type of question leads to an answer where the respondent is comparing one thing to another rather than giving you their feeling about each individual item
- Another disadvantage to a ranking is that if the respondent feels the same about two or more items, they are still forced to sort them into a ranking
- The results of a ranking basically tell you which is the most preferred and which is the least preferred item on the list, but you do not know from a ranking if the respondent likes or dislikes any or all of the items on the list.

Non-structured (open-ended)

- Non-structured questions, or open-ended questions, are questions where there is no list of answer choices from which to choose. Respondents are simply asked to write their response to a question
- Example: What do you like best about the Science Classroom Scientists Program? _____
- It is best to use non-structured questions when exploring new ideas and don't really know what to expect from the respondents.

Non-Structured Items (cont.)

- Open-ended questions let you get more insight into the respondents' thoughts and ideas about a subject.
- Open-ended questions are useful in identifying new ideas or information for which you have no basis to develop an all inclusive set of structured responses.
- The disadvantage to using open-ended questions is:
 - **Much more time consuming and difficult to analyze the data**
- In general you should try to limit the number of open-ended questions in your survey questionnaire.
- If a survey questionnaire is comprised of a majority or substantial proportion of open-ended questions, then you may need to do more exploratory research to get a better foundation of knowledge for the subject you are researching (e.g., interviews, focus groups, literature review)

Partially Structured Items

- In some situations, you may have a partial list of answer choices, but may still have some doubt or uncertainty about other possible responses. You can create a partially structured question such as the following:

Example:

- Why did you join the Science Classroom Scientists Program? (please select all that apply)
 - I really enjoy science
 - My teacher asked me to join
 - My teacher made me join
 - My parents asked me to join
 - I'm bored in science class & thought this would be fun
 - I thought it would help me do a better project
 - I thought it would help me win the Science Fair
 - I thought having a Mentor to talk to would be fun
 - I knew other students who were doing it
 - Other _____

Creating a Good Survey Questionnaire: Some suggestions

Clearly state your intentions with the research

- Many people are hesitant to answer questions about themselves and their opinions.
- Respondents will probably be more willing to help if you clearly state your intentions
- At the top of your survey, include a brief statement explaining why you are collecting the information and reassure each respondent that the information is confidential (if not anonymous)
- Seek IRB approval (Human Research Protection Program) if in doubt (<http://irb.ucsd.edu>)

Creating a good survey questionnaire

- Include instructions with your survey questionnaire
 - What may seem obvious to you probably is not very obvious to someone else
 - To ensure that you collect valid survey results, make sure you include instructions on how to answer the survey questionnaire
 - Include a short introductory set of instructions at the start of the survey questionnaire, and additional instructions for specific questions as needed.
- Your overall instructions may be something like:
 - Please mark the appropriate box next to your answer choice with an "x" or click the radio button that best describes your response
 - You may skip questions that you are not comfortable answering
 - Completion of this questionnaire will not affect your relationship with this institution, program, department, etc.

Creating a good survey questionnaire

- **Don't ask for personal information unless you need it**
 - Personal or demographic information (age, race, income level, etc...) may irritate some respondents and prevent them from completing your survey questionnaire
 - However, in many instances, this information is necessary for the research. If you need to ask for this type of information it is best to place the questions at the **END** of your survey questionnaire

Creating a good survey questionnaire

- **Keep questions short and concise**
 - The wording for survey questions should be short and concise
 - Each question should be clearly stated so that there is no misunderstanding about what is being asked
 - The best way to ensure your questions are well worded is to test them by having other people review and test your survey before you distribute it to the full sample

Common Problems in Survey Research

- Lack of focus and clarity
- Introducing Bias
- Leading questions
- Ambiguous questions
- Poorly written introductions

Creating a good survey questionnaire

- Ask only one question at a time (the double or tripled barreled question)
- A very common mistake in survey questionnaires
- Severely impacts the results of your data,
 - Validity problem-negatively affects the defensibility of your inferences from the item
- When you are writing a question, you must make sure that you are only asking one question at a time.

Double Barreled Question Example

- **Bad Question: Double-barreled Question**
- How have teachers and students at your school responded to the new 45-minute lunch period?
 - () Satisfied
 - () Unsatisfied
- **Good Question**
- How have teachers at your school reacted to the new 45-minute lunch period?
 - () Satisfied
 - () Unsatisfied
- How have students at your school reacted to the new 45-minute lunch period?
 - () Satisfied
 - () Unsatisfied

One Question at a Time

- The double-barreled question is asking about teachers AND students. This means that a "satisfied" response could mean any of the following:
 - Teachers are satisfied
 - Students are satisfied
 - Teachers and students are satisfied
- An "unsatisfied" response could mean any of the following:
 - Teachers are unsatisfied
 - Students are unsatisfied
 - Teachers and students are unsatisfied
- Due to the ambiguity of the question, you will not know what the respondent intended with their response
- To solve this problem, break this question into two separate questions, as shown in the example above.
- The two rephrased questions above are similar and the key word has been underlined. This is a good technique to ensure that the respondents are reading the questions correctly when the structures are so similar.

What Do You Think of This Survey Item?

Example from a Proposed Survey

- How well did your undergraduate experience prepare you for personal and professional situations that require:
 - Awareness of contemporary issues in society, technology, and the natural world, and appreciation of their complexity of cause and consequences (triple or quadrupled barreled?)
 - Ability to evaluate and choose between alternative courses of action
 - Ability to get along with people of diverse backgrounds and perspectives
 - Ability to work as a member of a team or group
 - You to understand international perspectives on economic, political, social, and cultural issues

Make sure the questions are unbiased

- Ask questions in a neutral way, i.e. that you are not leading respondents toward a particular answer
- This may seem simple, but when you are writing questions you will often find that the way you phrase the question may reflect your underlying opinion

Biased and Neutral Questions

■ Bad Question: Leading

- Do you think that the new cafeteria lunch menu offers a better variety of healthful foods than the old one?

Yes

No

No Opinion

■ Good Question: Neutral

- How do you feel about the new cafeteria lunch menu compared to the old one?

The new menu offers a better variety of healthful foods

The old menu offers a better variety of healthful foods

The selections are similar

No opinion

Ask Questions that can be Answered by your Subjects

- A common mistake is to ask questions that most people simply cannot remember.
Example:
- How much did you spend on school supplies last year?
 - \$0 - \$10
 - \$11 - \$20
 - \$21 - \$30
 - over \$30
- Although this question appears to be perfectly acceptable,
 - it is unlikely that many students will really remember how much they spent on school supplies.
- Most responses will probably be guesses rather than actual numbers
- If a reasonable guess is all that you are looking for, then rephrase the question
- How much do you estimate you spent on school supplies in the last year?
 - \$0 - \$10
 - \$11 - \$20
 - \$21 - \$30
 - over \$30

Order or Group Questions According to Subject

- As a general rule, if you have more than six questions in your questionnaire, then you should make an effort to organize your questions so the respondents can answer them as quickly as possible
- A good way to organize the questions is to group them together by subject
- Respondents can better focus their thoughts and answer a series of questions around these thoughts.

Present the Questions in a Clean and Organized Layout

- A clean layout will make it much simpler for people to respond to the questions and for you to collect the data
- Make sure that your method for marking answers is well explained
- Answer boxes are consistent throughout the questionnaire.

Test the Survey Questionnaire

- Consider administering your new survey with a small group (5 -10 people) to make sure that respondents clearly understand the questions you are asking and that you are capturing the information that you need for your study

Sampling

- Clearly define the target population
- The population is defined in keeping with the objectives of the study.
- A small, but carefully chosen sample can be used to represent the population.
- Sampling methods are classified as either *probability* or *non-probability*.
 - In probability samples, each member of the population has a known non-zero probability of being selected. Probability methods include random sampling, systematic sampling, and stratified sampling.
 - In non-probability sampling, members are selected from the population in some non-random manner. These include convenience sampling, judgment sampling, quota sampling, and snowball sampling.
 - The advantage of probability sampling is that sampling error can be calculated. Sampling error is the degree to which a sample might differ from the population.
 - When inferring to the population, results are reported plus or minus the sampling error. In non-probability sampling, the degree to which the sample differs from the population remains unknown.

Sampling

- **Census sampling:** Sometimes, the entire population will be sufficiently small, or it is technologically feasible and desirable to include the entire population in the study.
- **Random sampling** is the purest form of probability sampling. Each member of the population has an equal and known chance of being selected
- **Systematic sampling** is often used instead of random sampling. It is also called an Nth name selection technique. After the required sample size has been calculated, every Nth record is selected from a list of population members.
 - As long as the list does not contain any hidden order, this sampling method is as good as the random sampling method.
 - Systematic sampling is frequently used to select a specified number of records from a computer file.
- **Stratified sampling** is commonly used probability method
 - A stratum is a subset of the population that share at least one common characteristic
 - Examples of stratum might be males and females, or faculty and staff
 - Random sampling is used to select a *sufficient* number of subjects from each stratum

Sampling

- **Convenience sampling:** Used in exploratory research where the researcher is interested in getting an inexpensive approximation of the truth. As the name implies, the sample is selected because they are convenient.
- **Judgment sampling:** A common non-probability method. The researcher selects the sample based on judgment.
 - The researcher must be confident that the chosen sample is truly representative of the entire population.
- **Quota sampling:** The non-probability equivalent of stratified sampling. Like stratified sampling, the researcher first identifies the strata and their proportions as they are represented in the population. Then convenience sampling is used to select the required number of subjects from each stratum.
- **Snowball sampling:** Snowball sampling relies on referrals from initial subjects to generate additional subjects.
 - This technique can dramatically lower search costs,
 - Introduces bias because the technique itself reduces the likelihood that the sample will represent a good cross section from the population.

Increasing Response Rates

- Incentives
 - Prizes, drawings, promise not to be surveyed again soon
- Timing
 - Time survey to not coincide with other distractions
 - Final exams, holidays, graduation, campus events, voting days
- Avoid Survey Fatigue
 - Coordinate with others to avoid surveying same group at the same time or within short interval
 - Protect samples from being over-surveyed
 - Combine efforts on survey instruments
- Judgment-Is this survey really necessary?
 - If a small group, can they be called in a short period of time?
 - Complete short paper questionnaire
- Mixed Methods
 - Use different methods such as combining paper and web-based surveys, or telephone and personal interview. Not all techniques work the same with the population

Real Life Example

“We are one of the thesis research teams from the “Design Management” masters program at REDACTED. We are comprised of four dynamic individuals who bring unique set of skills and expertise that substantiates our team. We are highly motivated and eager to seek out credible information.

The research is focused on “Bottled Water” and its affects [sic] on our planet. In the times when the world is focusing on oil as a momentous energy resource that is on the verge of gaining the status of a deficient commodity, this thesis team is exploring indications that cognize [sic] drinking water as a much more serious and fateful resource. With a pragmatic attitude the team’s primary focus is on the bottled water industry and its impact on life, environment and economies. By 2015 over 60% of the world population will be living in urban areas and the use of bottled water is increasing by 12% per annum.

This survey is conceived and designed by the team to get firsthand information in order to understand the trends, perceptions and know-how of people worldwide. It is critically helpful for the team in securing a better perspective of the thought process, gaps, and awareness levels. The survey will be used as part of the thesis research and one of the pillars to base strategic and sustainable recommendation by using Design Management tools.

The team looks forward to your support and cooperation in reaching its goals. This survey will also create way for the future researchers who would be able to use these finding to elaborate and continue the process of strategic enlightenment and making the planet a better place for the generation to come.”

-Besides the verbosity, this introduction suggests high expectations-however the tendentious “introduction” is leading, presumptuous, and tedious

What is wrong with this survey?

Drinking Water Perception Survey

11 If a bottle of water costs you three times more, would you continue buying it?

12 If not, what would you do?

- I will drink regular tap water
- I will drink filtered tap water
- Other, please specify

13 Are you aware of the steps used to process a generic bottle of mineral water?

14 Do you believe that bottled water can be more expensive than oil?

15 When travelling overseas, do you find it easy to find your preferred bottled water brands?

If no, please explain.

What is wrong with this survey ?

Part II

20 How much importance do you give to drinking water on daily basis?
Select 1(low)-10(high)

1 2 3 4 5 6 7 8 9 10

21 How concerned are you that there may be water problems, including water shortages, around the world? Select 1(low)-10(high)

1 2 3 4 5 6 7 8 9 10

1 2 3 4 5 6 7 8 9 10

22 Please specify any global water issues or concerns you are aware of?

23 Have you taken any steps to help alleviate any water problems around the world? Please specify

24 Thank you for your participation. Please share any additional comments related to bottled water, tap water, and global water issues.

Survey Question Guide

- **What is a good survey question (for our purposes in this project)?**
- A good survey question has ANSWER CHOICES.
- YES or NO
- MULTIPLE CHOICE
- Conforms with availability of the information to the respondent
- A good survey question does not “lead” the population to an answer.
- A good survey question is SHORT.
- A good survey question is EASY to READ and UNDERSTAND.
- A good survey questions asks for knowledge or opinion, not both.

Resources

- ERIC Clearinghouse
 - Valuable resource for past research, surveys, and reports in higher and post-secondary education
 - Very good search engine
 - <http://www.eric.ed.gov/>
- ERIC Clearinghouse for Assessment and Evaluation
 - Provides information concerning educational assessment, evaluation and research methodology.
 - Provides resources to encourage the responsible use of educational data.
 - <http://ericae.net>
- Practical Assessment, Research, and Evaluation
 - <http://ericae.net/pare/index.htm>
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