

HCI and Design

Today: Survey Design

What are surveys and types of surveys

Cases, populations, samples

Sampling methods and sample sizes

Response rates

Question design

What are surveys and types of surveys?

Surveys are a method of gathering information from a sample of people, traditionally with the intention of generalizing the results to a larger population.

Surveys can be done:

- Self-administered
- Through a structured interview
- Over the phone
- Online
- etc.

Many tools for running surveys



Thinking about what you're researching: Case, Population, Sample

Case: each empirical instance of what you're researching

So if you're researching **professors at Cornell Tech**, Nicki Dell would be a case, as would Mor Naaman, Deborah Estrin, Shiri Azenkot, etc.

If you were interested in **Fast Food companies** McDonalds would be a case, Burger King would be a case, as would Subway, KFC, etc.

Thinking about what you're researching: Case, Population, Sample

Population – all the theoretically-relevant cases (e.g. 'All Team USA supporters'). This is also often referred to as the **target population**.

This may differ from the **study population**, which is all of the theoretically-relevant cases that are actually available to be studied (e.g. 'people who have purchased tickets in 2018').

Choosing a Study Population

Are they relevant to the problem?

Are they the group affected by the problem?

Or are they the group that will have to carry out the recommendations?

Or are they people who have dealt successfully with this problem elsewhere?

Can you get a fair sampling? How?

Will you get a high response rate?

Choosing a Study Population

Sometimes you can study all possible cases (i.e., the entire population)

e.g., All Cornell Tech professors

Often you can't study the whole population because it is too big, or doing so would be too costly, too time-consuming, or impossible.

e.g., All students who ever attended Cornell

In these cases, you need to select a **sample** of the population to study.

So how do you do sampling?

Rely on available participants

- Literally choosing people because they are available (e.g. approaching the first five people you see after class)
- Only justified if less problematic sampling methods are not possible.
- Researchers must use considerable caution in generalizing from their data when using this method.

So how do you do sampling?

Snowball sampling

- Researcher collects data on members of the target population s/he can access, and uses them to help locate other members of the population.
- May be appropriate when members of a population are difficult to locate (and/or access).
- By definition, respondents will be connected to other respondents, thus are more likely to share similarities with each other than with other members of the population.

So how do you do sampling?

Random Sampling (Representative)

Feasible only with the simplest sort of sampling frame (a comprehensive one).

The researcher enumerates the sampling frame (i.e. all possible participants), and randomly selects people.

So how do you do sampling?

Stratified sampling

Rather than selecting a sample from the overall population, the researcher selects cases from homogeneous subsets of the population (e.g. random sampling from a set of CM students, and from a set of MBA students).

This ensures that key sub-populations are represented adequately within the sample.

A greater degree of representativeness in the results thus tends to be achieved, since the (typical) quantity of sampling error is reduced.

How big of a sample do you need?

The sample size that is needed depends upon:

The heterogeneity of the population: the more heterogeneous, the bigger the sample needed

The number of relevant sub-groups: the more sub-groups, the bigger the sample needed

The frequency of a phenomenon that you are trying to detect: the lower the frequency that it occurs, the bigger the sample needed

How accurately you want your sample statistics to reflect the population: the greater accuracy that is required, the bigger the sample needed.

How confident you want to be about your results!

Other considerations when you are thinking about sample size

The response rate – if you think that a lot of people will not respond, you need to sample a larger number of people.

Form of analysis – some forms of statistical analysis require a larger number of cases than others. If you plan on using one of these you will need to ensure that you've got enough cases.

Generally (given a choice): Bigger is better!

(hence the sample size often reflects costs/resources.)

Questionnaire Design

Title & Purpose

Give your questionnaire a topic-related title

Include a brief explanation of the survey's purpose (short paragraph)

Include instructions for completing the survey

Include instructions for returning the survey

Assure respondents the survey is anonymous

Question Design

Survey questions should be easy to understand and hard to misinterpret.

- Use common language & clearly defined terms
- Use mostly closed questions
- Include demographic questions to help identify the sample
- Use precise, unambiguous language
- Make sure questions are valid & reliable

What to Avoid!

Avoid double-barreled questions

- *Do you like running and going to the gym?*

Avoid leading, biased questions

- *Will this product help you to be efficient and better at your job?*

Avoid loaded questions

- *Have you stopped stealing food from the TAs?*

Avoid repetitive questions

- *Why? Why? Why? Why?*

Avoid personal questions

- *What type of relationship did you have with your parents?*

Demographic Information

Do you expect age or gender to play a role in people's opinions?

Do you expect education level or income level to play a role?

Do you expect size of household or length of employment to play a role?

Do you want to compare responses from different groups?

Question Sequencing

Group questions that are similar

Put them in a logical order

Place demographic questions at the beginning

Put any sensitive or difficult questions at the end

Put any open-ended questions at the end

Question Types

Yes/No Questions, True/False Questions

Multiple Choice (Choose one)

Checklist (Select all that apply)

Agree-Disagree Scale (e.g., strongly disagree - neutral - strongly agree)

Likert Scales (0-5)

Ranking / Rating (e.g., rank these statements)

Grids answers

Open-ended questions

Choosing Response Categories

Limit types of questions and response sets to no more than three

Give clear-cut answer choices

Make response sets easy to navigate

Make sure response categories don't overlap

Make sure responses cover all possibilities

Avoid Overlapping Categories

e.g., How old are you?

0-15 years, 15-20 years, 20-25 years, etc.

Test run your survey!!

Once questionnaires with a mistake go out, it's too late to correct them! This will negatively affect your data AND has a negative effect on your credibility.

Summary: Survey Strengths

- Useful for describing the characteristics of a large population.
- Makes large samples feasible.
- Many questions can be asked on a given topic.
- Has a high degree of reliability and replicability.
- Is a relatively transparent process.
- Useful for measuring change over time.

Summary: Survey Weaknesses

- Seldom deals with the context of social life.
- Inflexible – cannot be altered once it has begun.
- Subject to artificiality – the findings can be a product of the respondents' consciousness that they are being studied.
- Can be bad for gathering certain kinds of information, e.g.,
 - highly complex or 'expert' knowledge
 - people's past attitudes or behavior
 - subconscious (especially macro-social) influences
 - shameful or stigmatized behavior or attitudes

Cheat Sheet

Method	Advantages	Disadvantages	Tips to Remember
Self-completion	<ul style="list-style-type: none"> • Cheap • Cover wide area • Anonymity protected • Interviewer bias doesn't interfere • People can take their time 	<ul style="list-style-type: none"> • Low response rate (and possible bias from this) • Questions need to be simple • No control over interpretation • No control over who fills it in • Slow 	<ul style="list-style-type: none"> • <i>Simplify questions</i> • <i>Include covering letter</i> • <i>Include stamped addressed response envelope</i> • <i>Send a reminder</i>
Telephone survey	<ul style="list-style-type: none"> • Can do it all from one place • Can clarify answers • People may be relatively happy to talk on the phone • Relatively cheap • Quick 	<ul style="list-style-type: none"> • People may not have home phones/be ex-directory • You may get wrong person or call at wrong time • May be a bias from whose name is listed/who's at home • Easy for people to break off • No context to interview 	<ul style="list-style-type: none"> • <i>Because you rely totally on verbal communication – questions must be short and words easy to pronounce</i> • <i>Minimize number of response categories (so people can remember them)</i>
Face-to-face interview	<ul style="list-style-type: none"> • High response rate • High control of the interview situation • Ability to clarify responses 	<ul style="list-style-type: none"> • Slow • Expensive • Interviewer presence may influence way questions are answered • If there is more than one interviewer, they may have different effects 	<ul style="list-style-type: none"> • <i>Interviewer should be non-threatening</i> • <i>Interviewer can clarify questions, but should be wary of affecting the content</i> • <i>Aim to ask questions in a clear, standardized way</i> • <i>If the list of possible responses is long, show them to the respondent for them to read while the question is read out</i>

Activity

Part 1: Design a survey

Assessing Restaurant and Entertainment Options on Roosevelt Island.

- Generate candidate questions
- Include different types of questions (yes/no, ratings, multiple choice, checkbox, short answer, etc.)
- Edit and refine your questions. Good questions:
 - Are clear to the informant
 - Don't lead to the answer you want
 - Ask about things the informant would actually know

Activity

WRITE YOUR NET ID AND
YOUR PARTNER'S NETID ON
YOUR SUBMISSION

Part 2: Critique

- Now, swap surveys with someone else
- Critique each others surveys. e.g.,
 - Analyze question types
 - Analyze question wording; can it be improved?
 - Analyze question sequencing
 - Does it collect any demographics? Why?
 - Are the questions clear and easy to answer?
 - Are the categories overlapping?
 - *Does it collect useful information to answer the question?*