Research Core Science
Intro to Research Projects:
Cases and Samples

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Undertaking a Research Project

- Determine the entire group of cases to which your research applies and what subset of that population, or sample, you are actually going to study.
- For researchers, the population is the universe of cases to which the research applies.
- The universe of cases includes every possible unit that meets a certain set of criteria that you define.
- When researchers analyze presidential approval ratings, for example, the population of interest is usually all American adults.

Research Project Next Steps

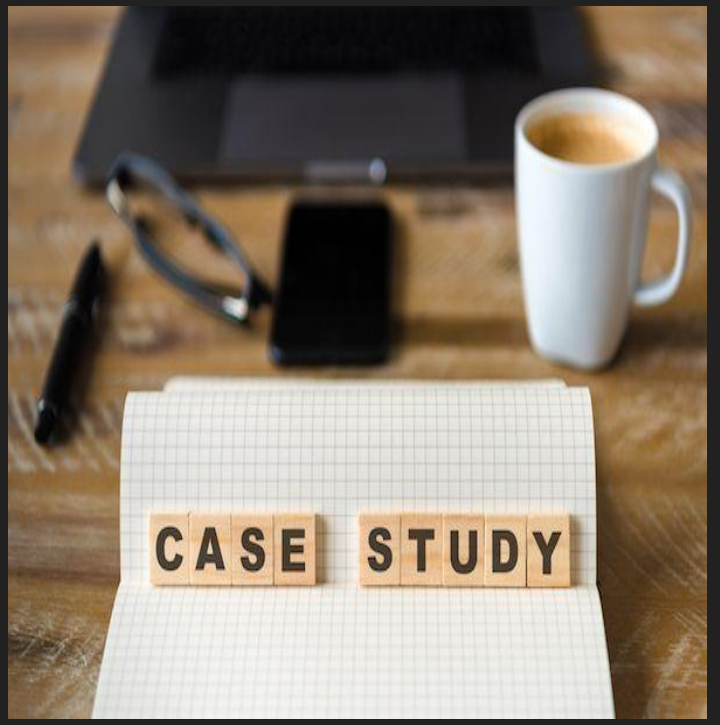
- Determine the set of cases that meet your criteria
- For example: people, animals, organizations, governments
- Your ideas depends on your disciplines and your project
- The population contains every instance of these that meet the criteria you establish.

Research Samples

- Any subset of this population
- It is a slice of the population, and there are usually rules about how that slice is chosen.
- Researchers often work with samples rather than populations.
- If you are studying presidential approval ratings, your sample would be some portion of the 250 million or so adult Americans—maybe just 1000 of them.
- Any time you are limiting your actual data collection to a subset of cases within a population, you are using a sample.

Research Cases

- A case is essentially a single unit of what a researcher is studying.
- A case would be a single individual adult American asked about whether he or she approves of the job the president is doing.
- The researcher will probably make several observations about that single unit, such as demographic information and political party affiliation.



Why Researchers Study the Sample Rather Than the Population

- Research is time consuming and expensive. It can also be impractical to survey every person in a population—for example, all American adults.
- Consider your skill set as a researcher. If you wanted to interview people about their social media habits in different countries, either you would have to be fluent enough in dozens of languages to conduct the interview yourself or you'd have to hire people to do the interviews for you.
- Research is cumulative. You might only study a small sample in your project, but combined with other projects that study other samples, collectively you might be able to say something about the population. So, you don't need to study the entire population yourself to have something to say that is of value.
- Sometimes the population is so large that you can't actually study it. In this age of big data, data sets can be so large that statistical models can't accommodate them, so you have to sample to make the data more manageable for analysis.
- It may not be possible to study the population. The data may not be available or the population might be unknown or difficult to access.

Random Vs. Nonrandom Samples

- Although there are many reasons why studying the entire population is difficult, the good news is that you don't actually need to study the population.
- When you use a random sample, you can estimate how well your sample actually represents the population and you can report how confident you are in those results.
- Even with a nonrandom sample, you can discuss the extent to which you can say things about your population after only studying a sample.

Thank You!
Questions and Comments