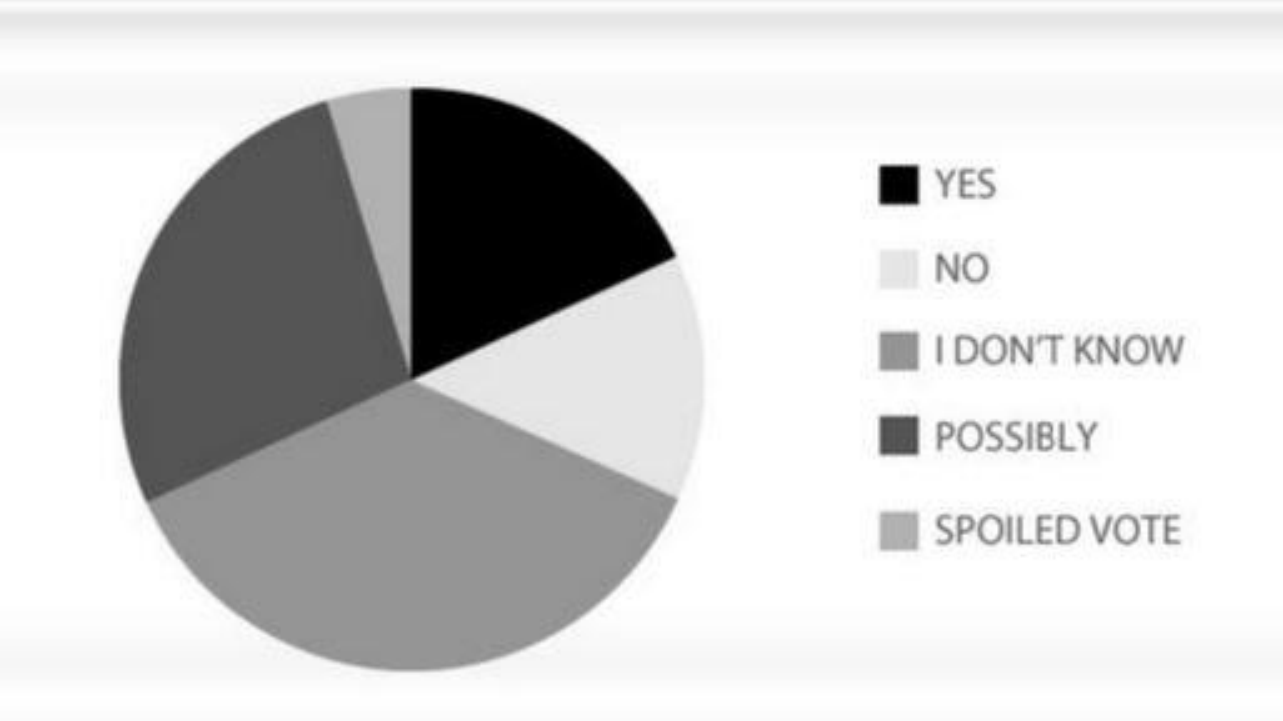
Research Methods



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INTRODUCTION

☐ How do we "know" things about the social world?

☐ What principles guide ethical research on people?

For decades, scholars knew that people who had served time in prison are much less likely to have a job than other people are. But we didn't exactly know why. The answer may seem obvious, but as it turns out, there are lots of possible answers. One is discrimination: perhaps employers just don't like people who were incarcerated. Or maybe convicted felons are somehow different than other job applicants. Maybe they like to break rules, so they end up getting fired. Perhaps they aren't very interested in working, so they don't search hard for jobs or quit more quickly if they don't like their coworkers. Perhaps they missed out on getting important training and skills while they were in prison, so they aren't as qualified as other job applicants.

Which explanation is correct? How would we know?

Devah Pager was a young graduate student when she studied this issue. She conducted an **audit study** to look for an answer.[1] She sent young people out in pairs to apply for the same jobs. She created fake resumes for them to use and kept everything about them the same except whether or nor not they had a criminal record for a non-violent drug offense (she also looked at how this worked for Black and White applicants; you'll learn more about that in a later chapter). The advantage of this method is that if everything about the applicants is carefully matched except one characteristic, then any differences you observe must be explained by the one thing that was different – in this case, whether applicants had a criminal history. And Pager found that it mattered: having a criminal record affected the applicants' chances of getting an interview. Even though their resumes were the same in terms of qualifications, the applicants who revealed their criminal record were less likely to be called back for an interview.

(Source)

When Pager decided to use an audit study, she was following a particular **method** – a study design that allows us to systematically study the world and be relatively certain that we arrive at accurate conclusions. Sociology is a social science, and a critical aspect of any science is that there are agreed-upon ways to generate knowledge. This sets science apart from other ways of explaining the

world, such as common sense or religious faith. At the core of scientific methods is a particular research attitude: skepticism. No matter who makes a claim, and no matter whether it seems to make sense, the job of scientists is to be skeptical of the claim and to try to find problems with it.

The importance of being wrong

All scientific studies of the social world share a key feature: scholars work hard to find evidence that our conclusions are wrong. This may seem confusing; wouldn't we want to show that our conclusions are *right*? But this is how scientific knowledge advances: it's not enough to provide evidence that a claim is right; you must search for evidence that it's wrong. We're never absolutely certain that our claims about the social world are correct, but the more times we try to show that our claim is wrong and can't do it, the more comfortable we can be that our idea has some basis in fact. Whether we're testing subjects in a lab or wandering the hallways of a school observing its inner workings, the basic approach is the same: we look for other potential explanations for what we observe, or any evidence that our claim isn't accurate.

As you're introduced to sociology, you'll encounter studies that use a variety of methods to generate knowledge. The primary lesson we hope you come away with is to be skeptical. Research isn't about affirming your beliefs; it's about being unable to prove them wrong.

Research ethics

The most essential consideration of any research project should be the ethics of the research. Research ethics are important for all research, but they are particularly acute when you are conducting research on people, or **human subjects**.[2]

Unfortunately, scientists don't always engage in ethical research. Most infamously, during World War II, German researchers (mostly doctors) conducted painful and often deadly experiments on people imprisoned in Nazi concentration camps;[3] the prisoners were forced to take part, and the experiments left them with burns, wounds, and other injuries. Aside from the horrific human suffering and death they caused, many of these experiments had little or no scientific value; they didn't help scientists cure diseases or otherwise benefit humanity.

After the war ended, many of these researchers were criminally charged and convicted. The international outrage at what the Nazi experimenters had done led to the establishment of the **Nuremberg Code** in 1948, which outlined basic ethical principles for research on people.[4] The first, and perhaps most important, principle is that people who take part in research must *voluntarily consent* to do so; they cannot be forced. The Code also established other key ethical rules, including the following:

- Researchers should avoid all unnecessary physical and mental suffering and injury to subjects;
- The degree of risk to subjects has to be justified by the likely benefit to humanity of the knowledge gained from the research;

- Subjects must be free to stop participating at any time;
- If researchers discover their project poses serious risks to human subjects, they must end the project immediately.

Doctor drawing blood from a patient as part of the Tuskegee Syphilis Study. (Source: National Archives, Atlanta, GA.)

Despite these clear principles, researchers often ignored the guidelines. One example is the **Tuskegee Syphilis Experiment**, conducted in Alabama from 1932 to 1972.[5] This project looked at how the symptoms of syphilis developed over time if left untreated; the researchers used a poor Black population in rural Alabama as their subjects. Over 40 years, researchers from the U.S. Public Health Service observed hundreds of men who had syphilis. They never told the men that they had syphilis; they simply told them they had "bad blood." Worst of all, after 1947 there was a clear treatment for syphilis: penicillin could completely cure people in the early stages of a syphilis infection. Even after the establishment of the Nuremberg Code in 1948 and its acceptance by the U.S. scientific community, the Tuskegee study researchers didn't tell their subjects about the cure; they let the men's syphilis progress so they could see what happened. As a result, many of the subjects unnecessarily died; others gave the disease to their female partners, who transferred congenital syphilis to their children during pregnancy, leading to lifelong complications including seizures and blindness. The study finally ended in 1972 when a whistleblower revealed that ethical guidelines were clearly being violated, leading to human suffering and death from a treatable disease.

Sadly, there are many other examples of unethical research.[6] As a result of such ethical failures, today federal guidelines protect research subjects.[7] Though most of these guidelines were established primarily to cover medical research, social scientists also have guidelines that guide our research practice.

Social scientists embrace the basic principles from the Nuremberg Code – particularly the idea of **informed consent**. This means that all human subjects must be informed about the research project, including any likely risks, before they agree to participate. For a participant to give *informed* consent, they have to have a full understanding of the risks (and possible benefits) of the research.

Social scientists don't rely just upon their own judgement to protect human subjects. Today, **Institutional Review Boards** (IRBs) exist at every research institution (including colleges and universities) to regulate any research that involves people; we can't begin any project involving people until we have approval from our IRB. IRBs are responsible for carefully evaluating the ethical implications of every research project involving human subjects. The IRB review is an important step in ensuring that our research is ethical and that we take the utmost care to protect the people who volunteer their time to help us pursue scientific knowledge.

Review Sheet: Introduction

Key Points

- Methods allow us to systematically study the world scientifically, giving us more confidence in our findings.
- An audit study showed that having been in prison hurt job applicants' chances of being hired, even when they were otherwise similar to other applicants.
- Skepticism is a key element of the scientific method; scholars constantly search for evidence that claims about the social world are wrong.
- For research to be ethical, those who participate must take part voluntarily, must understand the risks involved, and must be able to stop at any time.
- The Tuskegee Syphilis Study shows how researchers can cause severe harm and even death if they don't follow ethical research principles.

Key People

- Devah Pager

Key Terms

- **Audit study** – Research experiment in which researchers match participants on key characteristics.
- **Method** – A systematic study design.
- **Human subject** – Person who participates in a research study.
- **Nuremberg Code** – First international guidelines establishing research ethics.
- **Tuskegee Syphilis Experiment** – Long-term experiment on Black men in Alabama that demonstrates unethical research design.
- **Informed consent** – Voluntary agreement to participate in research based on a full understanding of the potential risks and benefits.
- **Institutional Review Board** – Group responsible for monitoring research projects at an institution to ensure they are conducted ethically.

TYPES OF RESEARCH METHODS

- ☐ What are the benefits of experiments, surveys, participant observation, historical analysis, and content analysis?
- ☐ What are the weaknesses of each of these methods?
- ☐ How do we choose a particular method?

As you plan your research project, you will decide *how* to collect your data, and what types of data you'll collect. Data generally fall into two categories: quantitative and qualitative. **Quantitative** data come in the form of numbers and reflect quantities or amounts. **Qualitative data** aren't numbers; they usually reflect general themes and might include transcripts from interviews or detailed notes from visiting a particular place to observe it.

Five common sociological methods

At the beginning of this chapter, we described Devah Pager's audit study. Audit studies are one type of **experiment**, a research method in which characteristics or behaviors are carefully controlled. By controlling the environment, researchers can isolate the impacts of the one characteristic that changes. Perhaps we want to know whether looking at their friends' social media accounts makes people feel more anxious. We might bring people into a lab and give them a short survey to measure how anxious they are. We could then have them scroll through their friends' social media accounts for 15 minutes and then give them the anxiety survey again. Since nothing else happened during the study, if we find they're more anxious after looking at social media than they were before, we can presume that viewing their friends' posts increased their anxiety.

Experiments can be extremely useful because they allow us to carefully study the impact of one thing at a time. Because we can control what happens to subjects, we can make sure that the only thing that changes is the variable we're interested in. But there are downsides to experiments, too. Especially for those that take place in a laboratory environment, researchers may wonder whether the situation was realistic. Would we see the same effect in the "real world" outside of the carefully-controlled lab? It's possible that a relationship that appears in an experimental setting wouldn't work the same way in our everyday lives, where we're never affected by just one variable at a time. And, as we learned, some of the worst ethical violations we've seen in science have been related to experiments. Because experiments give researchers so much control over subjects, it's especially important to think about ethical issues when designing them.

You may never have taken part in an experiment. But there's a very good chance you've participated in another research method: **surveys**, or sets of questions that subjects answer. They may

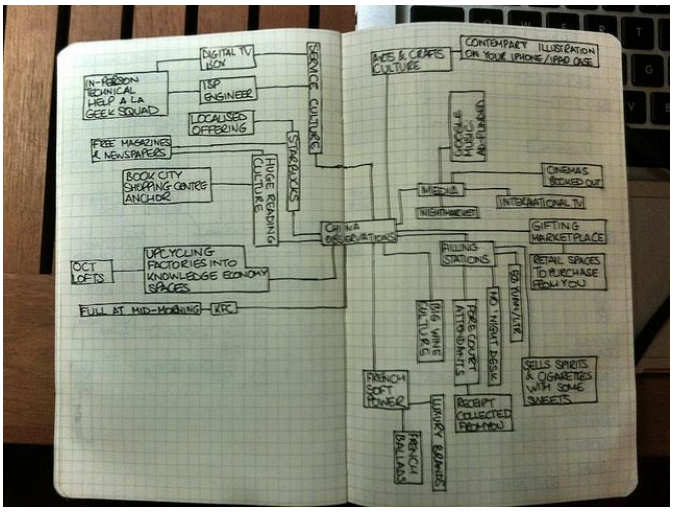
be conducted in person or sent through the mail, but increasingly surveys are completed over the phone or online. During the 2018 congressional campaign, you may have received phone calls asking you to rate how concerned you were about different issues. Or maybe you've been asked to complete a satisfaction survey after calling a customer service help line, rating your feelings about the outcome from "very satisfied" to "very unsatisfied." Because so many groups use surveys today – including social scientists, marketers, political campaigns, companies, and more – you're likely to encounter them fairly often.

Researchers may visit public places and collect survey responses on the spot. (Source)

Surveys are a very common method because they're a relatively cheap and quick way to get lots of information from large groups of people. That can give us a good idea of widespread patterns, as well as differences between groups (for instance, we might get different survey responses from men and women). But there can be problems with surveys, too. A common issue is low response rates – that is, only a small proportion of people you try to contact complete the survey (perhaps because they're frustrated from receiving so many requests to complete surveys!). Another problem is wording issues.[8] The way you write questions can affect the answers you get. For instance, one group of political scientists found that people responded differently when asked about "gay or lesbian" rights than when asked about "homosexual" rights;[9] because people tend to feel more negatively about the word "homosexual," using it can change how they respond on surveys.

As you read later chapters in this text, you'll encounter several descriptions of **participant observation**.[10] In this method, the researcher spends time among a group, directly observing and participating in the social world they're studying. This can mean moving to another country to live among a different culture, but you can also do participant observation closer to home. For instance, as she describes in the book *Class Acts*, sociologist Rachel Sherman worked at the front desk of two expensive hotels in the U.S. to study how the hotels ensure that their wealthy guests feel pampered.[11] The benefit of participant observation is that it allows researchers to collect a lot of extremely detailed information about social life in a particular group; we can learn what people do, how they interact, and what they think about those interactions. Sherman learned about the tactics hotel employees engaged in to create a "luxury" experience. For instance, room service waiters took notes on how hotel guests like their food served and gift store clerks kept track of any special requests from guests. This

information was entered into a computer database, allowing one guest to receive her papaya cut exactly the way she wanted without having to ask each time and another to have his favorite cigarettes waiting in his room on future visits, though the hotel didn't normally stock that brand. Observing and actively participating in life at the hotel allowed Sherman to understand the intricate ways hotel employees attended to the needs and preferences of their wealthy guests, making them feel valued and effortlessly pampered.



Participant observation involves taking detailed notes about every aspect of the environment. (Source)

However, participant observation can be time-consuming and expensive (especially if you have to move somewhere specifically to do your research). It may take years to earn the trust of a group and feel confident that you truly understand the social world you're studying (especially if there are language barriers). And you'll only gather data on a small number of people; you can't realistically get to know and talk to thousands of people. This can lead to questions about whether your findings apply outside of that small group.[12]

Finally, two related methods are **historical analysis** and **content analysis**.[13] These methods involve analyzing existing sources (such as historical records, media stories, or episodes of TV shows) to find key themes. Sociologists Erin Hatton and Mary Nell Trautner completed a content analysis of *Rolling Stone* cover photos, looking at how men and women were sexually objectified by the magazine.[14] Analyzing nudity, poses, and the focus of the photography, they found that sexualization of both men and women has increased over time, but that women are still sexualized more often, and to a greater degree, than men. In his study of suicide, Émile Durkheim used historical death records from towns across France to see how frequently suicide occurred.[15] Content analysis can help us identify recurring themes that are hard to see when we look at just one instance (for example, we can see patterns in objectification of women by looking at magazine covers over many years that might not be evident if we looked at just one example). A weakness of both methods is that you're stuck with the data that exists, whether or not it includes all the information you'd like. Maybe you want to look at differences by race and ethnicity, but you're using historical documents; if those documents don't indicate the person's race, then you can't study that topic, no matter how interesting it might be.

Choosing a method

So which method is right for your research project? There's no simple answer. Any topic can be studied with any of these methods (and with others; we've only covered the most common here), and every method has strengths and weaknesses.

If you want to understand how thousands of people think about an issue, or what behaviors they engage in (say, whether cigarette taxes have reduced the number of teens who smoke[16]), a survey is likely the best method for your project. On the other hand, maybe you want to study smoking, but you're interested in how teens perceive anti-smoking campaigns and how peer-group dynamics affect decisions to smoke. Then you might conduct a participant observation in a high school;[17] a survey probably won't get you the detailed information you need to fully capture how teens navigate the sometimes conflicting signals from friends, parents, and teachers about smoking. Participant observation might provide richer, more informative data. Another researcher might want to know how smoking is portrayed in movies; a content analysis of how often women are shown smoking in movies, particularly films aimed at young audiences, would provide insights into how smoking is represented in pop culture.[18] Finally, if you want to see whether those representations in pop culture affect attitudes about smoking, you could conduct an experiment where you show a scene with a famous actor smoking and then ask subjects whether they would date someone who smokes.

Each of these studies could provide you with valuable information about smoking. None of them are automatically better than the others. You have to consider what question you want to answer, what research skills you've developed, and what resources you have access to. If you don't have the time or resources to spend months or even years getting to know people and hanging out with them to observe their interactions, the participant observation study won't be realistic for you. If you don't enjoy doing statistical analyses on large datasets, or haven't developed that skill yet, then collecting a large amount of survey data won't help you find meaningful patterns.

Every sociological study you read about in this class was designed based on the skills, resources, and limitations that the researchers faced, as well as what method they thought would best get at their question. Instead of thinking of a study on its own, it's helpful to think of it as one piece in a bigger puzzle, each contributing a small piece to completing the puzzle.

Review Sheet: Types of research methods

Key Points

- Experiments allow us to isolate the effects of one particular characteristic. However, researchers may worry whether effects seen in the controlled world of an experiment apply outside of it in normal conditions.
- Surveys (whether online, by phone, or on paper) are a common and relatively inexpensive method of studying people. They allow us to gather information from

many people. However, low response rates and wording issues can affect the accuracy of the findings.
- Participant observation involves spending a lot of time among a social group, directly observing their interactions and behaviors. This provides extremely detailed information about the group, but can be expensive and time-consuming. This method also only allows us to collect data on a small group.
- Historical analysis involves evaluating existing historical sources.
- Content analysis occurs when scholars evaluate existing sources (such as newspaper stories or movies) to look for general patterns or themes. This method can identify larger themes. However, since it involves existing data, researchers are limited to whatever information the sources already contain.
- No one method is "best" for any topic. To choose a method, we have to consider our topic, what question we hope to answer, what resources we have available, and our research skills.

Key People

- Rachel Sherman
- Erin Hatton and Mary Nell Trautner
- Émile Durkheim

Key Terms

- **Quantitative data** – Data in the form of numbers that reflect amounts.
- **Qualitative data** – Non-numerical data.
- **Experiment** – Research method in which the environment is controlled to isolate the effects of one factor or characteristic.
- **Survey** – Gathering data by asking people sets of questions.
- **Participant observation** – Research method in which researcher spends time among a group, observing and participating in their daily lives.
- **Historical analysis** – Analysis of existing historical records.
- **Content analysis** – Analysis of existing sources, focusing on key themes and patterns.

DESIGNING A RESEARCH PROJECT

☐ What kinds of data can we collect to study the social world?

☐ What elements do we include when stating an hypothesis?

☐ What are the benefits of different types of sampling?

From topic to question

Once you've identified a research topic, you're ready to turn that topic into a **research question**. Your research question must really be a question. "I want to show that people from different cultures have different ideas about 'the family'" isn't a question. Who would disagree with you? Most people would probably agree that ideas about family life probably differ across cultures. A research question has to have more than one possible answer or outcome.

There's another problem with this example: "I want to show" is the wrong attitude for research. It sets up the project to find an answer you already have in your mind rather than a true question. Your goal isn't to have a point you want to show; your goal is to have a question you want to answer. And remember, the logic of science is to try to find evidence that your claim is *wrong*, not to show that what you already believed about the world was right.

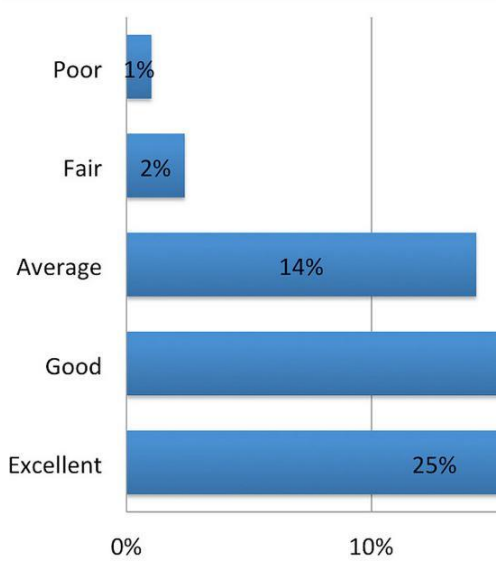
Variables

Once you have a question, you have to decide what you actually want to observe – your **unit of analysis**. Sometimes we're interested in individual people, but not always. We may ask questions about groups of people, or larger units like organizations, companies, or nations. For example, we might ask how people's incomes are influenced by their education[19] (our unit of analysis for this first question is individual people) or how democratic nations tax their citizens compared to monarchies (our unit of analysis is the nation). There is no "correct" unit of analysis; the appropriate unit depends on what question you want to answer. Once you identify your unit of analysis, you can determine what types of data to collect and which research methods are more or less appropriate for your project.

The thing you will observe is called a **variable**, a factor or characteristic that has more than one possible value. There are many different kinds of variables, which allow for different kinds of analysis. If you take a research methods course, you'll learn about them in detail. For now, we'll cover four common types of variables: nominal, ordinal, interval, and ratio.

Nominal data are classified by categories that can't be ranked in any meaningful way. Examples include eye color (e.g., brown, blue, green) or college major (e.g., sociology, physics, education, nursing).[20] While there are different answers for these characteristics, they don't have any obvious distance between them; brown, blue, and green eyes are different, but there isn't any hierarchy among them.

Ordinal data also fall into categories, but a scale provides rankings between the categories. The scale tells us the order of variables.[21] For instance, we might ask someone how satisfied they are with their jobs and ask them to respond from the following options: very satisfied, somewhat satisfied, neutral, somewhat unsatisfied, and very unsatisfied. We can rank those answers – we know that being



An example of ordinal data. (Source)

"very satisfied" is different than being "somewhat satisfied," and that both are more positive than being "very unsatisfied." But we don't know the precise differences between the answers. That is, while being "very satisfied" with your job is presumably better than being "somewhat satisfied," we don't know exactly *how much more* satisfied a person is if they answer "very" instead of "somewhat." Are they twice as content? Or only a tiny bit more? We can't tell. Being able to rank items can be important, but without knowing the difference between values, we're limited in the kinds of statistical analyses we can do.

With **interval data** and **ratio data**, we know the values of categories and they are placed on a scale, and we also know the precise distance between categories. A good example of interval data is height: we know that someone whose height is 6 feet is taller than someone whose height is 5 feet, 8 inches, and we know exactly how much taller that person is. We also know that the difference between two people who are 5 feet, 8 inches tall and 5 feet, 10 inches tall is exactly the same as the difference between people who are 6 feet, 2 inches tall and 6 feet, 4 inches tall: in both cases, two inches separate them, and inches are always a specific distance. Ratio data are the same as interval data, except that 0 must be a realistic answer that indicates the characteristic doesn't exist. Height isn't a ratio variable; someone can't be 0 inches tall, and it's not possible for a person to have no height. But income and number of children are ratio variables; you can have no income or no children, so 0 is a reasonable answer that indicates that the characteristic doesn't exist.

The types of data we collect determine which analyses we can do. With nominal and ordinal data, we have limited options. We can look at the **frequency** of different items (how often we observed each eye color, for instance), percentages, and the **mode** (the most common response). For example, a researcher might count how often a student asks a teacher for help, or might code transcripts of interviews with immigrant women to understand the specific challenges that women may face when moving to a new country.[22] With interval and ratio data, we can do much more sophisticated statistical analyses. This isn't necessarily better or worse; there are benefits and downsides to any type of analysis, and the "best" analysis depends on what we're interested in studying.

Independent and dependent variables

No matter what kinds of variables we're working with, our goal is to identify **co-variation**, or relationships between variables. Let's say we suggest a relationship between two variables: that a person's education influences their income. In this case, education is the **independent variable** (usually represented as X), meaning it affects the variable you're trying to explain. The other variable – income

– is the **dependent variable** (usually represented as Y), the one you're trying to explain; its value *depends* on the independent variable.

Sometimes when we look for a relationship, we don't observe any co-variation. Perhaps there just isn't any relationship between variables. To take a silly example, we might ask if the length of your thumb influences your income. We could observe the lengths of many people's thumbs (we have variation), and see how this characteristic is related to their income (again we have variation). But it's unlikely that we have any meaningful co-variation; our two variables aren't related to one another. And that's good to know, too! Finding out that characteristics are *not* related can be as important as finding out that they are.

From research question to hypothesis

Now that you have a sense of some of the basic building blocks of research, we're ready to make our question a little more specific by turning it into an **hypothesis**, a statement about how variables relate to one another.

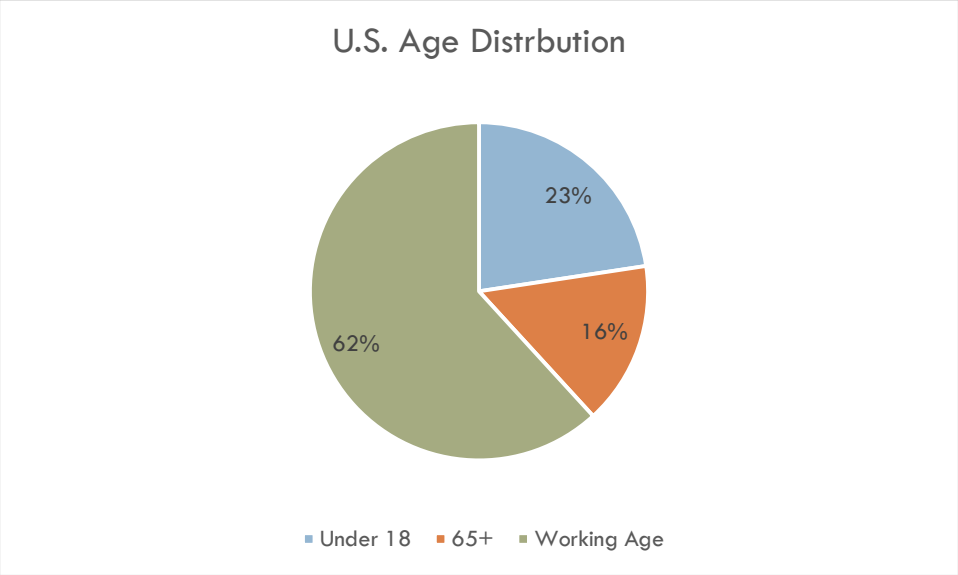
To create an hypothesis, you need to define the population you're interested in studying, under conditions that are of interest, relative to variables you think are important. The general form of an hypothesis looks something like this:

For *Population (P)* in *Condition (C)*, *Independent Variable (X)* is related to *Dependent Variable (Y)*

Are you interested in people from the United States, or just people from Texas? If it's Texans, then there's no point in gathering information about people from California. We rarely want to know about the entire world; we usually just want to know about a very small part of it. So we have to define who we want to know things about: our **population**.

We also have to decide what counts as a condition of interest. Say we're interested in the relationship between education and income in the United States. Do we want to gather information from everyone in the U.S.? Probably not. We probably want to study people who are of working age; if we're studying earnings, why study people who aren't old enough to have a job yet? We also might not want to gather information from people over age 65, since many of these people are retired and don't earn money in the labor market anymore. As we can see from Figure 1, excluding people who are under age 18 or over 65 removes a significant chunk of people from the total population (of course, we could include people age 15 and over, since they may have part-time jobs). Depending on your study, you might also exclude people who are unable to work because of a disability or because they're incarcerated. Carefully defining which conditions we're interested in is an important research decision.

Figure 1: U.S. Age Distribution



Source: U.S. Census Bureau Data

Now we've got a much more specific hypothesis:

For Americans (P) who are of working age (C), their education (X) explains how much income they make (Y)

These decisions about how to measure our variables are referred to as **operationalization**. This is how we convert an idea into something concrete that we can measure. In this example, operationalizing our variables was fairly simple; our biggest decision was about what age range to include. But other variables can be trickier. Imagine you wanted to study the effect that work stress has on a person's satisfaction with their marriage. How would you operationalize marital satisfaction? Would you ask spouses to fill out a survey about how satisfied they are, from "very satisfied" to "very dissatisfied"? Would you have them count how often they fight over a two-week period? Whether they have had an affair in the past year? And what about operationalizing work stress so we could measure it? We could do physical tests of the level of stress hormones in their bloodstream. Or ask how often they experience behaviors associated with stress (such as difficulty sleeping). We could also ask them to rate their stress level, from "very high" to "very low."

Whenever you do research, it's likely there are multiple ways you could choose to operationalize your variables. It's essential that you are clear about what your variables are and how you will measure them. Once you've done that, you can get to a fully-detailed hypothesis:

Among people who live in the United States, are of working age, and fill out a survey about their education and salary, those who report having spent more years in school will report having a higher salary than those who report less schooling.

This hypothesis is considerably more limited than where we started. Although social research aims to answer big questions about social life, research projects typically focus on narrow questions. When we're developing a research question, we have to narrow it to a question we can actually answer. But being more specific has its benefits: by asking a question we can actually answer, we'll know more about the world when we complete our research project than when we started.

The key lesson here is that before beginning any research project, you must be able to answer the following questions: what are the relationships I'm interested in studying? How do I decide who counts as part of my population of interest? What concepts do I want to study? And what counts as an observation of these concepts? Whether you do participant observation or an experiment, these are important questions you must be able to answer.

Selecting a sample

A homeless person's belongings in Rijeka, Croatia. (Source)

Once you have an operationalized hypothesis, it's time to figure out who or what you'll observe to test it. It's very rare that we can study everyone we're interested in (our population). Instead, we study a smaller group of people who represent that population. **Sampling** is how social scientists select representatives of their population.[23] Sampling occurs in both quantitative and qualitative work. For example, sociologist Mitch Duneier was interested in homelessness. He couldn't study all homeless people in the country, or even in New York City. Instead, he conducted an **ethnography** – an in-depth qualitative study of a social group and the group's culture – of a neighborhood in lower Manhattan where homeless people (mostly men) sold used books and magazines they retrieved from recycling bins out on the sidewalk.[24] He discussed how the homeless community informally managed their sidewalk markets and how they interacted with the wealthier residents of the area. Duneier wasn't studying all homeless people; he studied a sample of them (a neighborhood), with the hope that what he learned from his sample might reveal themes that applied elsewhere as well.

When sampling, we have to decide how to select a sample that is representative in meaningful ways of the larger population we want to understand. This step involves creating a **sampling frame**. The sampling frame is how you determine who will be contacted to be part of your sample. Examples include randomly selecting from a telephone book, voter list, or a mailing list, or randomly dialing phone numbers.

Every sampling frame comes with challenges. If you use phone listings, you won't be able to access people who have unlisted phone numbers, people who don't have phones, or people who only have cell phones. If you use voter lists, you'll only access people who are registered to vote. With home addresses, you miss people who have moved since your mailing list was created. You will also miss those living in institutions (such as nursing homes or prisons) and people who don't have homes. Selecting a sampling frame means considering issues such as cost, time, what it is you want to know, and from whom. If you would like to know what young people think about an issue, for example, using a telephone directory as your sampling frame may not be wise since many young people only have cell phones that won't be included in phone directories.

When you draw conclusions from your study, strictly speaking, you can't draw conclusions about the population of interest. You can only draw them about the group of people represented by your sampling frame. For example, if we're interested in the attitude of Americans about civic engagement and we decide to use a sampling frame of the telephone directory, we can only make claims such as, "For people listed in the telephone book, their attitudes about civic engagement are..." It's important to pay attention to the limits of findings based upon the sampling frame.

Once we've defined a sampling frame, we draw a sample. This can be done randomly or non-randomly. Many scholars, particularly researchers involved with large surveys, use **random samples**. For a sample to be random, each member of the population must (1) be known and (2) have some chance of being selected. If some elements of the population can't be selected (they have a zero

probability of selection), then the sample isn't random. An example would be if the sample excluded people who were in the sampling frame (say, a mailing list) because they live too far away and it would be too expensive to travel to talk to them. For a random sample, the researcher must know the probability of selection for each unit (whether the unit is a person, neighborhood, or school). The goal of a random sample is to get a sample that is truly representative of the larger population. That allows you to **generalize** your conclusions, or apply them to a larger population outside of the group you studied.

If we draw a **non-random sample**, where some members of the population don't have any chance of being selected, we're quite restricted in the claims we can make. If we're being extremely strict, we can only truly make claims about the actual people we studied, and no one else. That is, we have no generalizability, or ability to apply the findings beyond our sample. However, a lot of social science research uses non-random samples and still makes claims beyond the particular people studied. In these cases, scholars argue that even though their sample is non-random, it still represents general trends. These types of samples are common in qualitative work like interviews and ethnographies, but they also appear in experiments and surveys.

When selecting a sample, a serious concern is **nonresponse bias**. If people don't respond to your attempts to include them in your research, you have to figure out if there is a systematic reason why they aren't participating. Is there anything unusual about the people who aren't responding? In other words, are particular types of people participating at lower rates, and, if so, why? And does that mean you're missing out on an important group, making your sample unrepresentative of the population? Or are the people who *do* respond unusual? Maybe they care a lot more about the topic than most people and that's why they agree to participate when others don't. If there's a systematic reason why some people don't respond and others do, you run the risk of drawing incorrect conclusions based on a sample that is biased in some way.[25]

Say you're asking people their attitudes about sexual behavior. You construct a sample that is representative of the American population. And based on their responses, it looks like people have very permissive attitudes about sexual activity among teenagers. However, you see that a lot of people chose not to respond to your survey. What if those people also happen to have more conservative attitudes about teens having sex? Perhaps people who are likely to be more accepting of teens' sexual activity are also more likely to answer your questions, while people with conservative attitudes decline to answer. Because of the nonresponse bias – the patterns in who didn't respond to your survey– you can't be confident in claiming that your findings represent the larger population.

We end with a final word on sampling, particularly related to qualitative work. As we noted, qualitative work often uses non-random samples. So what can we learn from this work? Keep in mind that different methods have different aims. Quantitative methods seek to establish associations between variables. They answer questions like, "what is the association between education and

income?" Qualitative methods also look at associations, but they often address *how* and *why* questions. What is going on inside schools or with students that their education helps them earn more? Or we might explore how people use their educations to earn more money; how do they get access to the types of volunteer experiences that lead to later job offers? Showing these processes at work often requires digging down to specifics through ethnographic observation or interviews. Because of the ways these methods are conducted, representativeness is much harder to achieve, and sometimes it's impossible.

Qualitative researchers are sensitive to biases that might make their data unique and not generalizable.[26] But the potential weaknesses are often balanced by the benefits: they can provide insights into the rich texture of how social processes work that large-scale representative studies can't. Research doesn't happen in isolation. As researchers develop ideas about how the world works, these ideas can be tested and evaluated in other settings, by other researchers. Qualitative research may be limited in its generalizability, but it can provide ideas that are critically evaluated by quantitative work that is generalizable beyond the sample. In other words, both types of methods have strengths and weaknesses, but they can complement one another.

Review Sheet: Designing a research project

Key Points

- Your variables are the factors you're trying to explain. Your independent variable (X) is the characteristic you believe causes something; your dependent variable (Y) is caused by, or depends on, the independent variable.
- Nominal data have categories that can't be ranked in any clear way, such as ethnicity. Individuals have different ethnicities, but we can't mathematically rank them.
- Ordinal data can be ranked; scales from "very much" to "not at all" or "very satisfied" to "very unsatisfied" are ordinal. However, you don't know exactly how much distance is between each category.
- Interval data can be ranked and we know the exact distance between answers. Height is an example. Ratio data are similar, except that 0 has to be a realistic answer; an example is income.
- When analyzing data, we're looking for co-variation between variables. Our hypothesis is a statement of what we think the relationship between the variables will look like. An hypothesis includes a statement about the population, condition, independent variable, and dependent variable.
- Operationalization is a key element of research design. How you operationalize your variables will depend on what you're trying to study.
- Random samples allow us to study a small group and have it represent the larger population. Non-random samples may not allow us to generalize outside the study.

Key People

- Mitch Duneier

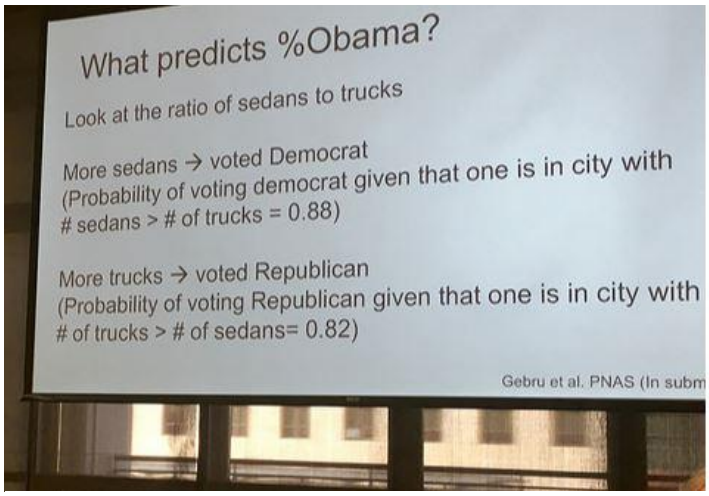
Key Terms

- **Research question** –A question about a research topic that we can reasonably answer.
- **Unit of analysis** – Item observed in a study (ex: individual people, cities, neighborhoods, apartment complexes, nations).
- **Variable** – Any characteristic that has more than one possible value.
- **Nominal data** – Values can't be ranked.
- **Ordinal data** – Values can be ranked, but distance between categories is unknown.
- **Interval data** – Values can be ranked and exact distance between categories is known.
- **Ratio data** – Values can be ranked, exact distance between categories is known, and 0 is a realistic possible answer.
- **Frequency** – How often a particular value is observed.
- **Mode** – Single most common value or response.
- **Co-variation** – Relationship between variables.
- **Independent variable** – Variable that causes a change in another.
- **Dependent variable** – Variable that changes in response to another.
- **Hypothesis** – Statement about how variables are expected to relate to each other.
- **Population** – The entire group of interest in a study.
- **Operationalization** – Defining variables into measurable items.
- **Sampling** – Selecting representatives of the population to study.
- **Ethnography** – In-depth study of a group and its culture.
- **Sampling frame** – Method for choosing which members of a population will be in a sample.
- **Random sample** – A representative sample in which every member of the population has some chance of being selected.
- **Generalize** – Apply findings beyond the sample to the larger population.
- **Non-random sample** – A sample in which not every member of the population has a chance of being selected.
- **Nonresponse bias** – Non-representativeness in a sample caused by patterns in who does and doesn't respond.

CORRELATION AND CAUSATION

- ☐ How is correlation different from causation?
- ☐ How can we demonstrate causation?
- ☐ Why are spurious variables a challenge for social science research?

After we've designed our study, chosen our sample, and collected data, we can analyze what we've found. Imagine we collect data and find a relationship between how much time fathers spend with their children and how healthy their children are; the more time fathers spend with their kids, the healthier the children are, on average. What can we say about that relationship? Did our independent variable (X – time fathers spend with their kids) cause our dependent variable (Y – kids' health) to change? In all likelihood, no. We've demonstrated a **correlation** between the variables – that they are related in some way. But that doesn't necessarily mean we've found **causation**, or evidence that the independent variable *caused* the change in the dependent variable.[27] There are a few reasons why.



This research presentation suggests a correlation between types of vehicles (sedans vs. trucks) and voting patterns. (Source)

First, we may not have identified the correct **direction of the relationship** (which variable affects the other). We may think that X causes Y, but maybe it's the reverse: Y could be causing X. In our example, we might think that children are healthier *because* their fathers spend time with them. This explanation seems to makes sense; it feels right. But we could have the direction of the relationship completely wrong. Perhaps the health of children affects how much time fathers spend with them; maybe it's stressful to spend time with unhealthy children, so fathers don't engage with them as much as with healthy children. Or maybe unhealthy children have high medical expenses, so their fathers work more to pay for the treatments, leaving them with less time to spend with their kid.

Establishing that we've found a **causal relationship** (one where causation exists) requires considerably more work than demonstrating a correlation. One way we can prove causality is through research design – for example, by using experiments.[28] As we explained in the discussion of types of research, experiments carefully control the environment to isolate the effects of the independent

variable. If we then see a change in our dependent variable, we can be more confident that it was caused by the independent variable, since that's the only thing that changed during the experiment.

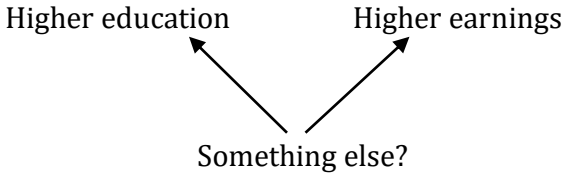
We can also identify the direction of a relationship if one variable clearly happens first, or precedes the other one; the variable that changes later can't possibly affect the variable that changed first. To test our example, we might look for cases where children get sick and see what happens. Do fathers decrease their parenting time after their child gets sick? Or we could look in the other direction: If fathers begin to spend less time with their children, does their kids' health suffer? If we can figure out which variable comes first, we have a solid case for arguing that we know the direction of the relationship.

But even if we figure out the direction of the relationship, it's possible there isn't a true causal relationship between our variables. A **spurious relationship** exists when it looks like there's a connection between two variables, but in reality some other variable we haven't taken into account is affecting both our independent and dependent variables.

Let's look at the impact of education on income. Researchers observe a strong relationship between these two variables; people with more education make more money. Education *precedes* (it comes before) income, so we can be fairly certain of the direction: education causes higher earnings. So we have a situation that looks something like this:

Higher education → Higher earnings

However, we still have to worry about whether we've found a spurious relationship. What if some other variable affects both level of education and earnings? Our worry can be presented in the following diagram:



Perhaps the "something else" we didn't take into account is parents' income. Maybe children of wealthier parents are likely to complete more schooling. And children of wealthier parents are also more likely to earn higher incomes. Parents' income might explain both their kids' education *and* earnings. In that case, the correlation between these two variables exists – they *are* related – but education wouldn't *explain* or *cause* earnings as we initially thought. The relationship between education and earnings would be a spurious relationship, since family background (in this case, how much parents earned) affects how much education their children get *and* their children's future earnings (perhaps because wealthier parents are able to connect their children to hard-to-get internships that lead to future jobs, for instance).

Spuriousness is a challenge for most social science methods except experiments. Experiments isolate the effects of a single variable, so there are fewer worries about spurious results. But for all other methods, an unobserved spurious variable is always a concern. As we design research projects, scholars try to gather information on the most likely spurious variables so we can rule them out as possible explanations.

Validity and reliability

A key question for all research projects is whether we are measuring what we think we are measuring – that is, do our findings have **validity**?[29] This is an important consideration. Random sampling and complex statistical analysis are pointless if it turns out that you weren't actually measuring what you meant to be. Say we studied attitudes toward different racial groups. We ask people, "Do you have racist attitudes toward other groups?" The problem we run into here is **social desirability bias** – the tendency for subjects to give answers that they think are socially acceptable.[30] In the U.S., most people are aware that it's generally unacceptable to be racist. This means that even if people hold extremely negative views of certain racial or ethnic groups, they are very reluctant to identify as racist.[31] So our question probably won't be a valid measure of racial attitudes. A better approach would be to avoid the loaded term "racist" and instead ask a series of questions about specific interactions or beliefs (such as how comfortable they would be with members of other races as neighbors, coworkers, or as in-laws).

We can encounter validity problems even when social desirability bias isn't a factor. Sometimes questions simply don't get at what we meant to measure. Maybe we're studying how satisfied spouses are with their married life, and we ask participants, "How likely are you to get divorced?" as a measure of their satisfaction. But probably only the most dissatisfied people would say they are likely to get divorced, so you may miss a lot of dissatisfaction that exists but isn't severe enough to cause people to consider divorce. Or people might be extremely unhappy with their marriages, but unlikely to get divorced; perhaps they have children that affect their decision, are members of a religious group that discourages divorce, or simply can't afford to set up their own independent household. There are lots of reasons that someone's prediction of whether they will get divorced might not be a good indicator of how satisfied they are with their marriage. Whenever social scientists design studies, we have to carefully consider what questions to ask to get at the characteristic we're hoping to learn about.

In addition to asking how valid our research is, we must ask about the **reliability** of our observations, or the consistency of the measurements. If several members of a research team interview people about why they volunteer to coach a children's soccer team, can we be sure that each researcher asks the questions in the same way? If the question is, "why is volunteering to coach important to you?" but one researcher uses a tone that suggests that volunteering is a waste of time while another uses a tone that suggests it's incredibly important, then subjects aren't really answering the same question, even though the words are the same. In the first instance, people may feel the need

to justify themselves, whereas in the second, they may want to confirm just how great volunteering to coach is. The result is low reliability; our measurement of responses to "why is volunteering to coach children's soccer important to you?" won't be consistent.

Challenges to reliability can also come from problems with the instrument used to collect the data, such as when survey questions are too vague and open to interpretation. For example, if we surveyed a group of students and asked them, "Is class important to your life?" some may answer about their social class (economic background), while others might reply about their experiences in the classroom. When designing research projects, we have to be careful that we ask questions in consistent ways and that research participants themselves interpret the questions similarly.

CONCLUSION

We have introduced you to some of the key elements of research design and interpretation. The main points we hope you take away from this chapter are that studying social life is messy and difficult, but that careful research design can help us investigate it scientifically, giving us confidence in our findings. Nonetheless, whenever you encounter research claims, it's always good to maintain some skepticism, especially when the findings reflect what you already want to believe. Social science is an ongoing project, where studies build on those that have already been completed. Later studies, with different research designs, may alter what we think we know – or may confirm previous findings. As we slowly add to sociological research on a topic, we collectively come to a better understanding of the complex and fascinating social world around us.

Review Sheet: Correlation and causation

Key Points

- Correlation indicates that variables are related in some way. It is easier to establish than causation, in which we can claim that one variable leads to a change in another.
- One way to establish causation is to see which variable precedes the other.
- A spurious relationship exists when some outside variable we haven't thought of explains the relationship between our variables. Research design should collect data on the most likely spurious variables in order to analyze their possible effects.
- Validity relates to whether we have measured what we intended to measure. Social desirability bias is a challenge to valid measures.
- Reliability refers to whether our measurements are consistent, so that different subjects interpret the question in the same way.

Key Terms

- **Correlation** – A relationship between variables.
- **Causation** – One variable causes a change in another variable.

- **Direction of relationship** – Which variable is affecting the other when a relationship exists.
- **Causal relationship** – Relationship that includes causation between variables.
- **Spurious relationship** – When a third variable actually explains the apparent connection between two variables.
- **Validity** – Whether questions accurately measure the intended characteristic.
- **Social desirability bias** – Problems introduced to data when respondents give answers they believe are socially acceptable.
- **Reliability** – Consistency of measurements.

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