Doing Survey Research

A Guide to Quantitative Methods

PETER M. NARDI

DOING SURVEY RESEARCH

Each day we are faced with continuing claims made by media pundits, politicians, teachers, and friends, often quoting research. Consider also the numerous comments and posts on Internet blogs, Twitter, and Facebook that illustrate the confusion between opinion and factual data. How do we learn to interpret the research we hear about and read, to distinguish opinions from scientific facts, and to use this knowledge to conduct our own studies to answer the questions faced in everyday situations?

Understanding the components that go into scientific research and learning how to do research, make decisions about which statistics to use, and analyze statistical findings are goals for everyone in today's research-oriented world. Questions about the reliability and validity of data from a study or public opinion poll come up routinely and need critical review. This book contributes to achieving these objectives.

Doing Survey Research is intended for people who want to learn how to conduct quantitative studies for a project in an undergraduate course, a graduate-level thesis, or a survey that an employer may want completed. This brief, practical textbook prepares beginners to conduct their own survey research and write up the results, as well as read and interpret other people's research. It combines survey design with data analysis and interpretation.

And it is for those who need to understand and critically interpret survey research found in scholarly journals, reports distributed in the workplace, and social scientific findings presented online in the media, on a blog, or in social media postings.

Essential new updates to this edition include coverage of Big Data, Meta-Analysis, and A/B testing methodology—methods used by scholars as well as businesses like Netflix and Amazon.

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DOING SURVEY RESEARCH

A GUIDE TO QUANTITATIVE METHODS

FOURTH EDITION

Peter M. Nardi

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preface to the fourth edition

Everything that can be counted does not necessarily count; everything that counts cannot necessarily be counted.

—Albert Einstein, physicist

Each day we are faced with continuing claims made by media pundits, politicians, teachers, and friends, often quoting polls, scientific claims, and scholarly research. Consider also the numerous comments and posts on Internet blogs, Twitter, and Facebook that illustrate the confusion between opinion and factual data. How do we learn to interpret the research we hear about and read, to distinguish opinions from scientific facts, and to use this knowledge to conduct our own studies to answer the questions faced in everyday situations?

Understanding the components that go into scientific research and learning how to do research, make decisions about which statistics to use, and analyze statistical findings are goals for everyone in today's research-oriented world. Questions about the reliability and validity of data from a study or public opinion poll come up routinely and need critical review. This book contributes to achieving these objectives by providing the methods to design systematic studies.

Doing Survey Research is intended for people who want to learn how to conduct quantitative research for a project in an undergraduate course, a graduate-level dissertation, or a survey that an employer may want completed. And it is for those who need to understand and critically interpret survey research found in scholarly journals, reports distributed in the workplace, and social scientific findings presented online in news media, on a blog, or in social media postings.

The objective is to keep the book brief, simple, and lively; it is not designed to be encyclopedic in covering all kinds of research. See it as a how-to manual for those who do not plan to go beyond an introductory course yet need to learn (or relearn) how to read survey data and make decisions about which statistics and methods to use when designing a quantitative study for a thesis, class, or workplace project.

FOCUS OF THE BOOK

The core goal of the book is to teach the methods to develop, carry out, and conclude a reliable and valid quantitative research project, while also providing the tools to critically evaluate research presented in academic journals and popular media. This is accomplished by organizing the chapters in the same sequence of most quantitative survey projects:

- Understand the purpose of doing research, in particular the strengths of survey designs compared with other methodologies and data collection tools (Chapter 1).
- Find topics to study by reviewing previous research in the professional journals to clarify ideas, formulate theories, and develop hypotheses (Chapter 2).
- Learn to construct and operationalize valid and reliable measures for a set of research questions or hypotheses (Chapter 3).
- Create a professional questionnaire by developing the techniques and learning the guidelines used by survey researchers (Chapter 4).
- Distinguish various probability and nonprobability sampling strategies (Chapter 5).
- Learn how to use basic statistical techniques and decide which statistics to use with different types of measures (Chapters 6 to 9).
- Read and evaluate tables of data and statistics that appear on the Internet, in news media, reports, and academic journals (Chapters 6 to 9).
- Interpret the data and make conclusions about the research questions or hypotheses when writing or presenting different kinds of reports (Chapter 10).

NEW TO THIS FOURTH EDITION

Since many of the basic statistical and research methods concepts change little over the years, what makes a new edition lively and topical are the examples illustrating the key ideas in the text. Each chapter has updated data and illustrations from current academic and popular articles relevant to today's Web-oriented students, including studies focused on topics related to social media. Many of the exercises at the end of each chapter have also been revised with newer research and examples from a wide range of social and behavioral studies disciplines. In addition, information and illustrations of the key concepts provided in the *Doing Survey Research* website have been updated: https://doingsurveyresearch.wordpress.com/

Growing exponentially in today's Internet-mediated world is the collection and analysis of Big Data. This edition includes a brief discussion of what Big Data is and the ethical issues which emerge not only about privacy, but also how it relates to the methods discussed in this book about sampling, probability, and research design.

Another research method that's become increasingly popular is "meta-analysis." The updated text includes a short discussion of what meta-analysis is and how it is used to improve research reliability and validity. Along with these two research concepts, short discussions about the so-called A/B testing methodology and social network analysis have been added. These increasingly popular methodologies often require access to large data sets and powerful computers, so details about how to use them are left to more advanced textbooks. This new edition simply focuses on explaining what they are as a way to help learners to understand what they mean and what their strengths and limitations are when reading about them in scholarly research and popular media.

A few readers have asked for coverage of qualitative methods and more advanced statistics, such as logistic regression. However, this is a *beginner's guide* to quantitative survey methods rather than a comprehensive, encyclopedic volume on all sorts of social science research techniques. The objective is to keep the book brief, simple, and lively. I see it as preparing a foundation for those students who will go on to graduate school, where they will learn more advanced methods and statistics. And I view the book as a how-to manual for those who do not plan to go beyond an introductory course, yet need to learn (or relearn) how to read survey data and make decisions about which statistics and methods to use when designing a study for a thesis, class, or workplace project. I have received many e-mails from nonstudent readers in real-world workplaces who have been tasked with writing a questionnaire, conducting a survey, and analyzing data and picked up the book to refresh their memory of material learned in a course taken years before. These are all the audiences for which this book is written.

ACKNOWLEDGMENTS

Remember to visit the *Doing Survey Research* website to find additional information and examples of the concepts and ideas discussed in this textbook: https://doingsurveyresearch.wordpress.com/

WHY WE DO RESEARCH

1

Research is formalized curiosity. It is poking and prying with a purpose.

—*Zora Neale Hurston, writer*

LEARNING GOALS

In this chapter, the differences between everyday thinking and scientific thinking are discussed. An argument is made about the advantages of doing survey research and understanding various kinds of research: exploratory, descriptive, explanatory, and evaluation. The chapter concludes with a comparison of quantitative and qualitative research methods. By the conclusion, you should be able to give examples of everyday thinking, discuss the components of scientific reasoning, and describe the different types of research methods.

Remember the time you asked one of your parents to buy a particular pair of expensive running shoes, let you go to a party, or do something just because "all the kids" were? Well, the astute parent would question this and wonder if it were really true that *all* your friends were actually involved. "Why not collect some data first and then report back to me what percentage of your friends own those clothes or are going to that concert?" That's what parents trained to do survey research might say!

Too often we make conclusions about entire groups of people on the basis of observations of only those we know or see around us. Or to put it more scientifically: Too often we generalize about an entire population on the basis of a nonsystematic method of collecting data from a biased sample. This is one of the major differences between everyday experience, pseudoscience, and scientific thinking. What follows

is an argument for doing things more systematically and scientifically than usual, and a justification for doing quantitative survey research as one of many approaches to understanding how and why humans think and act the way we do.

EVERYDAY THINKING

How we see the world around us is shaped by a variety of forces that include the books we read, the television and movies we see, the culture's rules and guidelines for good behavior we repeatedly hear, and the teachings from the religious organizations and schools we attend. It is also highly influenced by our friends—the peer groups we spend a good deal of time in and from whom we learn. But so many of these social forces are linked to each other in ways that tend to reinforce our already held values and beliefs. Conclusions based on networks of friends and family members are hardly useful, then, in trying to understand how most other people think or behave.

The trick of socialization, to paraphrase writer Carlos Castaneda, is to convince us that the way we see the world is the only reality, one supported by social consensus. By experiencing more diverse cultures and meeting a wider range of people, we come to understand that to make conclusions based simply on the way our friends and family live, what they believe in, or how we were socialized, is limiting. Too often those with whom we associate are similar to ourselves in values and beliefs; we end up selectively sampling like-minded people and erroneously concluding that "everyone" experiences reality in the same way we do.

Although we seem to manage fairly well on a daily basis, our everyday experiences are often based on methods that can lead to problematic decisions with outcomes that can seriously affect our lives. Imagine if some friends told us that they were able to stop flu symptoms and prevent a recurrence of a cold simply by eating only the white filling in a chocolate cookie every day for a month. Would we rush out to buy bags of these wonderful cookies and use them to ward off the flu instead of getting a vaccine? It certainly would be more fun (and fattening) but not likely to keep us from getting the flu. What if they told us to take vitamin C or echinacea? Would we run to the store to get some, or would we critically inquire about the research that tests this general statement?

Every day we make conclusions and act on them with similarly limited information. Recall how sometimes you get a message from someone you suspected would be getting in touch: "I had a feeling you were going to text me." Never mind that you don't remember the number of times you did not guess accurately or that you normally contact that person around the same time every day.

Or recall when you ran to the nearest movie theater to catch a film your friends exclaimed to be the best ever and some critic called "the best film of the year," even

though it was only March. Although it would be impossible and crazy to survey a large number of people every time we need to make a decision to do something, be aware of how the process of making a choice is often not much more systematic than believing the person with the secret cure for the common cold. Yet we make such decisions because we know from experience ("empirical data") that this particular friend's recommendations have almost always been reliable.

What we do in everyday life is typically the result of some less scientific thinking than the procedures we would expect policy makers, neurosurgeons, or airline pilots to follow when they are in control of our well-being. In other words, what we need to consider is how ordinary thinking differs from the systematic methods needed to understand complex social behavior and attitudes. By doing so, we begin our research journey on the correct foot.

The characteristics of ordinary, everyday thinking and inquiry include

- Biased questions
- Limited sampling
- Selective attention, perception, and retention
- Pseudoscience.

Biased Questions

Did anyone ever ask, "Do you really want to go to that Justin Bieber concert?" and say it with an air of disdain? It would be difficult to answer, "Yes, I really do want to hear him sing" since the questioner was implying that the performer was so bad no one in his or her right mind could really want to go. And remember the time someone wanted to know the reasons why everyone was so dissatisfied with the workplace cafeteria, thereby assuming that "everyone" was unhappy and all we needed to do now was find those reasons? Consider the research question usually worded this way: "Why is it that I study more than the other students yet they get better grades?" and the implications already formed by the phrasing. Rhetorical questions are posed to make a point rather than to seek an answer and are certainly not suitable for scientific data gathering.

In each of these three cases, everyday nonscientific thinking leads us to ask questions that are already *biased* or slanted in a particular direction. The first is already providing the answer in the way it is worded. It does not allow for a full range of possible answers, so the only conclusion would be that everyone who was asked the question in this way in our survey does not want to hear Bieber sing. We'd be making an accurate statement of what was uncovered, but the answers are only as good as the way the question was framed and applicable just to the *limited* sample. The tendency,

of course, is to *generalize* to all people, that is, to make conclusions about people not surveyed using the information obtained from those that were.

Similarly, the second question proceeds from a *selective* assumption that may not be accurate, so the only answers we get from a survey of employees' experiences are negatively *biased* ones about the organization. How many times do we really ask, "Why is this workplace such a happy one?" with the same enthusiasm and inquisitiveness as we asked why people are dissatisfied with work? Or, more accurately, how often do we ask what they think about their workplace, without qualifying it as good or awful when we inquire?

With the third question about study habits, we are talking ourselves into believing something that may not be true, but asking it in this form just the same. Rarely do we, in everyday talk or thought, put it the following way: "I wonder if there is a relationship between the amount of time people study and their grades." We often begin with a particular viewpoint and proceed to ask questions from that selective position, sometimes not even aware that we are doing so. Thus, the answers we get tend to verify what we already believe (sometimes referred to as "confirmation bias") and give us a false sense of having found some objective and honest answers (see Box 1.1). We now have the reasons why our *limited* sample of employees hate the cafeteria food and falsely *generalize* that everyone hates the food because we never found out how many liked it in the first place.

BOX 1.1
EVERYDAY BIASES

A great source for studying how people selectively see the world, make use of limited samples, generalize to people not studied, and ask questions in biased ways is to read the Letters to the Editor page in newspapers or the Comments section of online blogs and responses to controversial Facebook posts. Soon after a major shooting occurred in a suburban high school, a series of comments appeared in an online story, each with its own explanation for what happened and each likely representing the writer's own personal values and biases. These opinions included the following possible reasons:

1. Life in white monotonous suburbia and the alienation that results
2. Republican congressmen who refuse to pass legislation controlling guns
3. Parents who neglect their kids' depression and isolation
4. Schools that allow hate-filled speech and all sorts of taunting and bullying of kids who are different
5. Legal abortion and the theory of evolution, both of which lead to a devaluation of life.

Take a look at your local paper's letters to the editor or the comments for an online column or Facebook post and see how many examples you can find of everyday, nonscientific reasoning.

Our daily interactions with friends, family members, and the people we encounter on a routine basis rarely require anything more scientific. Ordinary discourse contains many such poorly worded questions and biased assumptions, and the world manages to keep going. However, imagine the consequences of asking questions in these ways when trying to understand more complex and important behaviors and opinions or when attempting to develop public policies that can seriously affect people's lives. No one should think that an educational institution, for example, can create rules to require a certain amount of study hours per week simply based on the findings of a survey that asks only why those who study less get better grades. Should the Human Resources office modify an entire organization on the basis of the results of a survey focused solely on the dissatisfaction of the employees who took the time to fill it out?

Everyday thinking, in other words, typically employs biased phrases and other nonscientific styles of framing questions when making sense of the world we live in. The results of these queries may help us decide which movie to watch, but they are not useful when it comes to making choices that affect social policies or arriving at conclusions fairly and consistently. How we can improve the way we ask questions and minimize the biases that derive from faulty wording is discussed in more detail in Chapter 4.

Limited Sampling

Most of the time, we make sense of reality by reflecting on the experiences we've had. It is not too difficult to figure out how our friends feel about various rules, political leaders, music, and television programs. We are generally good at assessing the climate of opinion about controversial topics among our peers and those whom we encounter regularly in our living spaces. Unfortunately, there is also the tendency to take these limited experiences and then assign them to larger groups of people.

"Everyone I know hates the food in the cafeteria"—so it must be bad. "I talked with others in the class who have good grades and they're not reading the assignments"—so it doesn't matter how much one studies. "No one I know liked that movie"—so it must be failing at the box office. While it may sound reasonable to make such concluding statements, the problem, of course, is that we have simply taken the opinions or measured the behaviors of those we already know and then made the assumption that they are somehow representative of "all" people: "But, Mom, *everyone* is going to be driving to school this year." But if they are our friends, they are likely to be people who share our tastes and values.

Confirmation bias is this tendency to seek information and sources that support our already held opinions. We tend to avoid sampling websites, opinion articles, and news sources that contradict or challenge our values and views.

Selective Perception

People forget that most of the time our lives are constrained and limited by the social spaces we inhabit. Ethnicity, social class, gender, sexual orientation, and religion are just some of the many characteristics that provide different experiences and push us into living in unique subcultures and communities. Everyday life is often a series of encounters in limited areas. We rarely get to move outside our circumscribed environment and, when we do, we do not always see what is there. It is part of human existence to *selectively* attend to, perceive, and recall information. After we have arrived at some belief about people or an assumption about some events, we use these beliefs to focus our attention mostly on those aspects that already fit our assumptions. We typically see only those dimensions, and we tend to remember better just the events that verify our already held beliefs. This confirmation bias is made possible through the processes of selective perception, attention, and retention. It's difficult to experience reality differently from the way we are taught, and contradictory evidence can sometimes even end up reinforcing already held positions (see Nyhan and Reifler 2010).

How many of us actually noticed what our boss or favorite professor wore yesterday? Most of us don't *attend* to or pay attention to such things unless we have a particular interest in evaluating someone else's clothing styles. And even if we did notice, what aspects of the clothing did we even see? We tend to *perceive* only some things, in this case, perhaps just the shoes or the type of shirt. And when we do make note of them, for how many days do we *retain* this information? Can we actually recall what we had for dinner or what our best friend wore a week ago?

As a result, for us to suggest that we understand how other people feel or behave on the basis of our own limited sampling, selective perceptions, and selective recall is problematic. At best, we could say that we have a sense of the way the people in our lives approach the world. To use that everyday information, though, to enact policies or change the rules of the game for everyone else would be overgeneralizing and unethical. *Overgeneralization* occurs when we attribute patterns to an entire group and make conclusions about a wide range of people or events on the basis of a few observations. The limitations imposed by our everyday investigation of only the people around us restrict our use of that information for scientific purposes. How best to sample and generalize and how to go beyond the convenience of talking to those whom we already know are the topics of Chapter 5.

Pseudoscience

One type of everyday thinking that has the appearance of being scientific yet relies heavily on anecdotal claims is termed *pseudoscience*. According to Kida (2006), it is characterized by a search for evidence to support preconceived ideas, a disregard for

data that would falsify a claim or provide alternative explanations, a lack of skeptical critical thinking, an acceptance of weak evidence for extraordinary beliefs, and an absence of systematic methods to test claims.

It is not unusual to see pseudoscience at work in advertisements for "lose weight fast" treatments or "miracle drugs" to cure baldness or the latest antioxidant food fad that can prevent the common cold. Often the claims are based on a few people posed in "before and after" photos with testimonials based on limited personal anecdotes. Implied is a cause-and-effect connection when there might at best be only a weak or no correlation between the treatment and the cure.

SCIENTIFIC THINKING

In order to be able to make valid and reliable conclusions about human behavior, we are required to go beyond the components of everyday thinking and pseudoscience. While those techniques and styles may help us get along in our daily lives, the job of measuring various aspects of the social world and people's beliefs and behaviors demands a more deliberate approach. Certainly, intuition can play some role in arriving at conclusions and making decisions, but would we really want someone about to operate on our body to do so guided by today's horoscope or by some hunch and intuition?

We would hope surgeons base their decisions on techniques and knowledge gained from decades of scientific studies and research. Although understanding study habits and grades is hardly as important as brain surgery, if we were to enact some policies and procedures that can have a positive or negative impact on students' well-being, then investigating patterns of studying also deserves some rigorous and systematic methods. Developing policy or drawing conclusions about social life is best accomplished with the assistance of scientific procedures rather than with a dependence on the everyday thinking described previously. Science is certainly not the only way of arriving at information, but it may be better suited for specific kinds of questions.

Scientific thinking is characterized by

- Empirical observations or data
- Systematic and deliberate methods
- Objective, intersubjective, and replicable procedures.

Research Design and Empirical Observations

Let's consider what these mean and see how they differ from everyday thinking. In order to be more confident that the findings on which our policies will be based or the conclusions we make about social relationships are accurate, we need to develop

scientific methods for gathering our observations. We need a *research design*, or a plan for translating our research objectives into measurable and valid information. Simply making decisions on the basis of what we see happening among our friends and the people we encounter is not a reliable procedure for making conclusions about larger groups or categories of people. Yet one of the basic principles of science is involved in everyday thinking; that is, we regularly make observations and collect data.

Empiricism states that the primary source of knowledge is experience, especially that gained through the senses. We understand the world by observation (data collecting), not just via speculative thinking or theories. At some point, to be scientific, we must encounter the reality that is out there and experience through observation whether the educated hunches or ideas we proposed in our theories are substantiated.

Systematic and Deliberate Methods

Empiricism is also part of the everyday procedures we sometimes erroneously use to make conclusions, so other elements are essential. These observations must also be *systematic*, *objective*, and *replicable*. This is where issues of representative and random sampling, measurement reliability and validity, and other methods used to make observations come into play, as discussed in later chapters. By spelling out clearly the details of how we are to measure and whom we are to observe—and "what" we will do to get the "who" to show us the "how"—we are engaging in the methodical step-by-step procedures of research design that make scientific thinking more *systematic* and deliberate than everyday thinking. Although such procedures don't always guarantee completely accurate results, they do eliminate many of the errors that are part of ordinary, nonscientific observation procedures and allow us to generalize and arrive at conclusions about larger numbers of people or events.

Objective, Intersubjective, and Replicable Procedures

Some might argue that the elimination of errors and biases is what makes science more *objective*, that is, less dependent on emotion or personal prejudices and values. Because the procedures have been systematically detailed, other researchers could *replicate* the study (i.e., repeat it using the same methods with a new sample) without interference of individual biases. Of course, researchers have biases and hold a wide range of values that not only may affect the topic they choose to study, but also could influence the procedures they develop to make the observations and collect the data. After all, scientists engage in everyday thinking, are subject to confirmation bias, and employ selective perception as well. This is why replication is a necessary step in the scientific process.

There is nothing wrong with this subjectivity; indeed, it is a key process in uncovering the multiple ways people understand reality differently. Rather than assume that certain words or concepts are objective, we sometimes need to recognize that there are alternative meanings attached to those concepts. For example, when a questionnaire inquires about marital status and the range includes "married," "divorced," "widowed," and "single/never married" categories, how are these options viewed by respondents who are living with someone of the same or opposite sex in a romantic relationship? What if respondents were cohabiting with and not legally married for 15 years and the relationship ends—are they still "never married" or "separated/divorced?" Subjectivity provides the insights and meanings others have about social behavior and attitudes and contributes new ways of developing measurements more comprehensively. We cannot, however, use subjective perspectives as a sole research method if we plan to make scientific, generalizable observations.

If the procedures are comprehensively described, and other researchers with differing values and beliefs replicate the methods in their studies and achieve similar results, we can more confidently conclude that the methods and findings are less affected by any personal biases of the researchers. Perhaps a better word than *objectivity* to describe what is going on is *intersubjectivity*, or what Ira Reiss (1993: 6) suggests happens when people with differing perspectives collectively agree on a particular way of seeing reality: "So we can define objectivity in science as those views of the world that come to be agreed upon by the community at any one point in time."

Finding the "truth" about human behavior and social processes is an ongoing goal of the social sciences. Knowledge is achieved and "facts" are built incrementally over time. The information we get at any one point is an approximation of the truth and is constantly being modified, clarified, and expanded with each new study. Scientific ideas are tentative since falsifying evidence could be uncovered with other research designs and samples. This is why it is so important to develop replicable scientific ways of measuring and thinking about patterns of social behavior and attitudes in order to achieve the basic goals of research. As Kolbert (2017: 70) put it,

> One way to look at science is as a system that corrects for people's natural inclinations. In a well-run laboratory, there's no room for myside [confirmation] bias; the results have to be reproducible in other laboratories, by researchers who have no motive to confirm them.

THE PURPOSES OF SCIENTIFIC RESEARCH

Research on human social behavior and attitudes is conducted for many reasons, including to explore, describe, explain, and evaluate for the purpose of understanding an issue in depth, arriving at decisions, and making predictions.

Exploratory Research

Sometimes research is conducted for exploratory reasons, that is, to get a rough sense of what is happening on a particular topic for which we don't yet have enough information. People use *exploratory research* to assess the opportunities for undertaking a study, to try out various methods for collecting information for a proposed larger study later on, or to learn the language and concepts used by those who will be studied. Exploratory research also has been designed to ascertain the needs and goals of a particular organization (often called *needs assessment research*) in preparation for a study or evaluation. *Focus groups*—a collection of respondents organized in a group discussion format to present their ideas about a subject—are frequently designed to achieve many of these exploratory objectives.

Let's say we are interested in understanding more regarding what concerns students about their educational institution that may cause them to drop out or stay in school. Although we should review the many studies that have been done already on dropouts, we have reason to believe that the unique dimensions of this school are particularly important to consider. So we design a study to explore what is going on at this school by developing a series of focus group discussions with students to learn their language, or jargon, uncover relevant topics, and understand different ways of viewing the institution in order to construct a better questionnaire for a later research project.

Descriptive Research

A typical goal of exploratory and almost all kinds of research is to provide basic information describing the topic and respondents involved. *Descriptive research* is often the first step in most research projects and the primary objective for some, like the U.S. Census or the General Social Survey (GSS) and similar large surveys designed for gathering information. If we are interested, for example, in understanding the relationship between the number of hours spent studying and grades earned, we need to get descriptive information about the characteristics of the students (gender, ethnicity, major, etc.), what their grades are, how many hours a week they study, how many years of education they already have, and how many hours a week they work or participate in sports or other activities. The goal of such a survey would simply be to present basic information profiling the respondents (referred to as the *demographics*) and describing the issues under study.

Explanatory Research

Once we have some descriptive information, we might then want to uncover the reasons why a relationship between grades and hours spent studying differs for the students we sample. We do this kind of research in order to *explain* relationships, to

uncover the reasons "why" or "how" some social phenomena occur among respondents. *Explanatory research* is designed to answer the "why" question: why there is a range of behaviors or opinions held among people surveyed. Why don't people all have the same attitudes toward capital punishment or vote in the same way? Ideally, we want to be able to explain or perhaps predict these opinions and behaviors with efficient, less complex reasons or causes.

Remember when a romantic relationship ended and we wanted *the* explanation or single cause for its not working out? We'd all like to have just one simple reason (such as "it was the other person's fault"), but we know down deep that there are many reasons, since most complex behaviors and attitudes require more than one cause. However, the "law of parsimony" suggests that we should look for the fewest number of reasons (causes, explanations) to account for most of the differences (variation) that exist among our respondents in the behaviors or attitudes we are attempting to study.

Evaluation Research

We are typically interested in understanding the causes of human social behavior and people's opinions about a variety of issues. Sometimes, however, research is conducted to evaluate specific outcomes and to provide the explanations for why and how a particular result occurred. Applied or *evaluation research*, as it is called, focuses on problem solving and measuring the results and specified outcomes of the implementation of various social programs and policies (the "causes"). Many educational institutions also develop evaluation tools to assess students' achievement of the schools' intended objectives and goals.

For example, a university wants to know whether its study abroad program results in students achieving an intercultural and international understanding of people and issues. It creates a new type of program designed to produce such understanding. Evaluation research would focus on the objectives of the program and assess whether the new study abroad experience directly resulted in any change in students' behavior and attitudes.

Decide and Predict

With information collected systematically, those responsible for a program or policy can make informed decisions about what dimensions need to be changed, enhanced, or removed. Using research to *decide* and *predict* outcomes is a central goal of much research, especially evaluation and explanatory research. By figuring out the causes of behavior or opinion, we use this information to make informed decisions about future events. One goal of research is to estimate what might happen after the

research is completed, that is, to make forecasts about a company's future earnings, or to estimate the impact certain social policies will have or to guide us in making *decisions*. Wouldn't it be great if teachers could present information to their students demonstrating that there would be a high likelihood of success in school if they put more hours into their studying? Wouldn't it be a worthwhile goal of research to be able to understand the causes of earthquakes or tornadoes and use this knowledge to *predict* their occurrences and make decisions about building codes and other modes of disaster preparation?

Cause and Effect

However, to determine causation, it is essential to (1) establish that a relationship (or correlation) exists between the alleged cause and the observed outcome or effect; (2) determine the timeline of occurring events, that is, the cause must precede the behavior or opinion in time; and (3) eliminate other plausible explanations or alternative causes. If we can show that (1) there is a connection between hours of studying and grades; (2) the grades come after the amount of study hours claimed (it is possible that someone with low grades could increase the number of hours studied as a result of the grades); and (3) no other possible explanation exists for the grades, such as number of hours working at a job, teaching quality, or time spent at parties, then we can more confidently conclude that how much students study explains a good deal of why they achieve various grades. We usually are not able to explain why one particular person does well or not; instead, we may have found an explanation for variation among a sample of students. Most social science research is focused on understanding differences among aggregate groups of people, not in explaining or predicting one individual's behavior or opinions.

All three of these elements must be present to declare a cause-and-effect relationship. Too often, in everyday thinking, people assume that *correlation* is the same as *causation*. Just because two variables are related does not mean we can conclude that one *caused* the other (see also Nardi 2017).

Many humorous examples of false causation based on correlation have been offered by researchers. A good illustration is a correlation between the number of fire engines at the scene of a fire and the amount of damage done. Although a strong relationship can be demonstrated between more fire engines and worse damage, the fire engines don't cause the damage. Similarly, just because most heroin addicts drank milk as children does not mean that milk is a gateway substance leading to heroin use and causing addiction (see Box 1.2 for another example).

Despite being aware of the clearly faulty reasoning in jumping from correlation to causation, researchers can make this logical error in their interpretation of data because it is often impossible to control for all available alternative explanations.

BOX 1.2
CORRELATION OR CAUSATION?
STORKS, VACCINES, AND CAUSATION

By Peter M. Nardi

Before learning about the "birds and the bees" we may have been told how the stork brought us, as a little baby, to our parents. Even with a minimal interest in the animal kingdom of storks, birds, and bees, we likely started to question this curious story.

That is until we heard this news about Denmark: Post-1960 there was a significant decline in the number of nesting storks in Denmark (Dybbro 1972). Also, beginning in the late 1960s, Denmark started recording its lowest average number of childbirths per woman. In short: fewer storks = fewer babies.

Here rests one of the fundamental errors in debates, research, and uncritical thinking: confusing correlation with causation. So powerful are spurious relationships that they can sometimes have significant public policy implications. Consider the story of autism and vaccines.

In 1998, *The Lancet*, a respected medical journal, published Dr. Andrew Wakefield's research claiming a link between autism and the MMR (measles, mumps, rubella) vaccine. Ever since, people in the autism community have raised concerns about live-virus vaccines and their children's health. Fueled by the popular media, in particular the Internet, Dr. Wakefield's research has resulted in a decline in vaccinations and, some say, a resulting increase in childhood diseases like measles.

However, on January 28, 2010, Britain's General Medical Council concluded that Dr. Wakefield acted dishonestly, unethically, and irresponsibly when carrying out his research. And on February 2, *The Lancet* said, "we fully retract this paper from the published record" (Park 2010).

Although it's reasonable to have some concerns about the many ingredients that go into vaccines and other medications, it's still important to look more closely at the specific issues raised by the MMR vaccine and autism research, and use our critical thinking skills in understanding what is going on. When assessing research, it's important to evaluate several elements: the sample, the quality of the data collection process (such as survey item wording or interview style), and how the data are analyzed (appropriate statistics and charts).

Let's begin with the sample: The original Wakefield study took blood samples from only 12 English children who were attending his son's birthday party. They were each paid the equivalent of around $8. Already, we begin to question the quality of the research when such a small sample is used. It's also important at this point to consider any ethical questions about paying the children studied and how they may have been affected by having invasive blood samples taken.

For research to carry any weight, replication is essential, and studies with larger and better samples have not demonstrated a correlation between vaccines and autism. Furthermore, before cause and effect can actually be declared from a correlation, a timeline must demonstrate that the cause came before the effect. For example, students who study more tend to have higher grades. But does studying lead to higher grades, or do those students who have higher grades (maybe who are smarter to begin with) tend to study more to ensure continuation of a high GPA?

BOX 1.2 CONTINUED

When reviewing how researchers collected the data, assessing which data occurred when is important. In many cases, it turns out that autism appeared before the vaccinations were administered.

In analyzing the data collected, in order to claim a cause and effect, review how the research eliminated alternative explanations. Do changes in industrialization and urbanization in Denmark (to go back for a moment to the stork story) connect to a decline in the stork population as well as to changes in family life and fertility? Spurious correlations are easily addressed by searching for a third explanation. The appearance of autism tends to occur between the ages of 2 and 5, the same period when vaccines are administered.

Just because there is a societal increase in autism rates coinciding with an increase in the distribution of vaccines, it does not indicate a cause and effect relationship. Increases in autism rates could be due to other explanations such as changing definitions of autism and better diagnosing techniques, thus illustrating how other variables can create the illusion of a correlation between immunizations and autism. Other studies also indicate that boys are about four times as likely to have autism despite similar rates of vaccination between boys and girls.

Finally, a major study of almost half a million Danish children found no difference in immunization records between those children with and without autism. To date, there is no scientific evidence in the published literature of a causal connection between immunization vaccines and autism. And thanks to Denmark we have the research on this spurious relationship between autism and the MMR vaccine—and, of course, on storks and childbirth.

Reprinted from *Pacific Standard* online magazine, March 1, 2010, https://psmag.com/storks-vaccines-and-causation-56430e4f2b97#.vwx4elql1.

Many studies, for example, show a relationship between high-fiber, low-fat diets and lowered risk of heart disease. Does this mean that eating such foods causes lower rates, or could some other explanations be involved? Some researchers have found that the type of people who eat healthy foods also tend to smoke less, exercise more, and experience less stress. Could these behaviors, instead of diet, be the more direct cause of healthier hearts? Only with replication of studies demonstrating continuing strong correlations, controlling for these other plausible explanatory variables, and clearly delineating the timeline of which behaviors come before others can researchers conclude with confidence that certain foods lead to better health.

Concluding Thoughts on Scientific Methods

For us to describe, explain, and predict with any accuracy, it is necessary that we develop a research design of scientific procedures and avoid the kinds of everyday thinking that could lead to incomplete data and erroneous conclusions. While it is often tempting to make decisions, explain causation, and predict the future on the basis of psychic powers, intuition, and "gut feelings," these are not particularly useful skills for convincing funding agencies, public policy makers, or research methods professors that what we have uncovered is accurate and unbiased.

This is not to say that scientific procedures are always ideal and free of problems. There are many behaviors and opinions that elude the methods of science. How well can we really measure and explain the process of falling in love, predict who will successfully be our best friend, or fully understand religious fervor? Many have tried, but sometimes more abstract ideas require other kinds of methods besides quantitative scientific ones—or should be left to the work of poets and artists!

The research problem or the evaluation questions must determine the methods. And for most of the issues social scientists study and the complex behaviors we want to understand, scientific thinking and procedures work well. Yet the method should not precede the problem to be studied. Before we choose a questionnaire survey approach, we should consider the different kinds of methods that can be used to study human social behavior and then select the techniques that best fit the questions we are seeking to answer.

RESEARCH METHODS

Doing survey research is a skill, an art, and an intellectual process involving collaboration, patience, and creativity. As Laumann et al. (1994: 57) claim, "In practice, survey research methods, like many specific scientific laboratory techniques, remain more an art than a science." Survey research is also a choice of one method among many from which to select. As such, choosing to conduct a quantitative approach to understanding the social world can answer only some questions. It is not ideal to begin by saying, "I want to give a questionnaire out, but I am not sure what my topic is yet." Research questions must come first, and then the choice of the relevant method to study them should follow.

There are many different ways of gathering data, depending on the questions we are asking, whom or what we are studying, the financial and time limitations of our project, and the amount of detail we desire. Each method comes not only with strengths and weaknesses that must be evaluated carefully before selecting but also with a set of assumptions about the nature of knowledge, beliefs in the efficacy of science, and other philosophical questions about how we can make sense of the world in which we live. Most methods can be combined to study a topic (often termed *triangulation* or *mixed-methods research* when two or more measures or methods are used), and several of them share similar procedures, sampling strategies, and ethical considerations. Larger research textbooks (such as Babbie 2016) provide more details about the different methods and the scientific assumptions that go with them. Because the focus of this book is on quantitative survey methods, here is a brief overview of other research methods, with key points to consider when evaluating whether questionnaire survey methods are best suited for a particular study (see Box 1.3 for the advantages and disadvantages of each major type of research methodology).

BOX 1.3
COMPARING METHODS

Each method for collecting data has advantages and disadvantages that should be evaluated before you decide which ones are most suitable for a particular research topic. Table 1.1 shows some points to consider for collecting data with surveys, interviews, focus groups, qualitative methods, and experiments.

Table 1.1   Comparison Points for Data Collection Methods

METHOD	ADVANTAGES	DISADVANTAGES
Quantitative: Surveys	• Less costly to reach larger samples • Standardized questions • Ideal for asking about opinions and attitudes • Less labor intensive to collect data or train researchers • Can guarantee anonymity • Suitable for probability sampling and more accurate generalizability • Easier to code closed-ended items • Respondents can answer at own pace • Better for sensitive and personal topics • Easier to replicate a study • Can address multiple topics in one survey • Ideal for computer-based and online surveys • Easier to compare with other studies using similar questions	• Self-report requires reading ability in the language (age, eyesight limitations, education) • Possible gap between what people report they do and what they actually do • Return rate can be low for mailed and computer-based surveys, thus limiting generalizability • Closed-ended questions can be restrictive and culturally sensitive or dependent • Difficult to explain meaning of items and probe answers • Depend on asking about recollected behavior • More difficult to code open-ended responses • Can't guarantee respondent answering it was the person intended to answer it • Requires skill in questionnaire design • Long and complicated surveys can be tiring to complete and lead to errors • Easy to overlook, skip around, and misunderstand questions • More difficult to generate reliability and validity for one-time-use questionnaires
Interviews: Structured face-to-face or telephone	• Standardized questions for structured interviews • Can explore and probe for additional information • Can clarify meaning of questions • Telephone interviews are less costly and can reach larger samples • Less likely to have skipped or missed questions • Unanticipated answers can occur, thus leading to new, unexpected findings	• Limited to smaller samples • Face-to-face interviews can be time consuming • Training required for interviewers • More difficult to code open-ended responses and unstructured interviews • Interviewer characteristics (race, sex, age) and style could bias responses • Some respondents reluctant to give information over the telephone • Not as ideal for collecting sensitive or personal information • More difficult to replicate • Face-to-face interviews are not anonymous • Telephone surveys are not ideal for complicated closed-ended items or choices • Face-to-face interviews may require payment for participants

BOX 1.3 CONTINUED

METHOD	ADVANTAGES	DISADVANTAGES
Interviews: Focus groups	• Ideal for exploratory research • Better for insights about complex issues and topics • Suitable for studying opinions and attitudes • Group interaction generates new ideas as respondents build on others' comments • Can probe for additional information • Best for small groups (six to 12 range)	• Not as ideal for collecting sensitive or personal information in some cultures • A few people can dominate the discussions • Responses easily affected by what others say • Minority views often not disclosed • Not as suitable for studying behavior • Time intensive to run • Requires expert skills in leading groups • Small sample sizes in one geographic area • May require payment for participants • Limited to a few topics at a time • More difficult to code responses
Experiments	• Ideal for studying cause-and-effect explanations • Better control of variables • Easier to replicate • Suitable for collecting quantitative data and doing statistical analyses • Better for achieving internal and external validity • Good for A/B marketing designs	• Ideal for smaller samples but limited generalizability • Experimental laboratory situations are artificial • Narrow range of behavior is measured • Respondents may act in a way because they know they are being studied (demand characteristics of experiments) • Can take much time to run experiments • Equipment costs • May require payment for participants • Ethical concerns about informed consent and harm
Qualitative: Observations and field methods	• Ideal for studying behavior in actual sites • Unanticipated and unexpected findings can be collected • Not limited to structured items on a survey • Allows for respondents' views and perspectives • Behavior and situational factors observed in context and real time • Nonverbal data can be observed and analyzed • Ideal for studying interactions among people • Content analysis can be performed on documents and other written or visual records and artifacts	• Limited to smaller samples • Time consuming • More difficult to code observations and responses • Reliability of coding of observations or other content analyses needs to be established • Observer bias can affect what is being observed and how • Respondents' behavior can be affected by being observed • More difficult to assess opinions and attitudes • Field notes take more time to write and analyze • More difficult to replicate • Ethical concerns about informed consent, role of the participant observer, and potential harm • Not ideal for some quantitative statistical analyses

Experimental Designs

When interested in understanding how the manipulation of a variable can explain specific outcomes on another variable, some researchers find it useful to conduct experiments. A classic *experimental* research design typically involves comparing two groups, one called the experimental group, the other the control group, to both

of which respondents have been randomly assigned. In the experimental group, the researcher conducts some treatment on the subjects and measures its effects in comparison to another group that does not receive the treatment or to a group receiving a different kind of treatment.

Experiments typically occur in laboratory settings where the researcher can control the environment to prevent other plausible causes from affecting the outcome of the treatment or experiment, thereby ensuring internal validity or accuracy and perhaps allowing for generalizability, or what is sometimes called external validity (see Chapter 3 for a discussion of validity). Experimental designs are also suited for testing specific hypotheses and for doing applied evaluation research, rather than for conducting an exploratory study.

Imagine we are interested in understanding the impact on teenagers of an educational film about prejudice and racism. In the classic experimental design, we would randomly assign the teens to two groups. Each group completes a questionnaire focused on attitudes toward racial minorities and other indicators of prejudice. The experimental group views the film (the treatment) while the control group does not, or perhaps sees a different one if we were interested in comparing films. A few weeks later, a questionnaire on racism is given to the two groups and comparisons are made. Ideally, those who watched the film now have lower prejudice scores than the group who did not see the film; we infer that the film was partly responsible for this change. There are many variations of this classic experimental model, many of which are used in evaluation research and by experimental psychologists and social psychologists (see Campbell and Stanley 1963 for detailed descriptions of various experimental and quasi-experimental designs).

One popular variation, especially among marketing researchers, is called *A/B testing*. Subjects are presented two versions of a website, an advertisement, a text, or a graphic. One randomized group receives version A and another randomized group sees version B in which one thing has been altered (perhaps a different image, headline, or landing page for a website). Responses are monitored (how many click a button or link, reply to an e-mail, or leave the webpage) and analyzed to see which version has been more successful.

Qualitative Methods

If the goal is to understand human behavior in its natural setting and from the viewpoint of those involved, then an appropriate method is often a qualitative one, as opposed to a quantitative method in which predetermined categories and a more structured scientific approach are involved. *Qualitative research* explores new topics by getting into the settings where people carry out their lives. Anthropologists

typically use qualitative methods to understand a culture, and some of the earliest sociologists (often referred to as the Chicago School of sociology) were pioneers in using these methods to study how people lived in small towns and urban centers (Plummer 2001).

Field research, participant observations, ethnographies, case studies, open-ended interviews, and focus groups are some common types of qualitative research methods. At some level, they all involve observing what people do, what they produce, and how they interact verbally and nonverbally. For example, if we wanted to understand how people make decisions about what food to eat in the employee cafeteria, we might do better observing them than to ask such questions days later on a questionnaire. Going to the cafeteria, taking extensive notes about the kinds of people who choose different foods, observing how much they eat, listening to how they interact with other diners, and talking with them about their choices are just some of the methods of a qualitative approach.

Trying to understand with more depth and sensitivity people's subjective understandings while acting in their social situations is the main goal for qualitative research. We typically do not get to study a very large number of people when using qualitative techniques compared with survey research, but we usually get richer details and a stronger sense of the variety of ways people engage with the world around them. It is a technique ideally suited for doing exploratory research as well.

Content Analysis and Archival Research

It is not always necessary to study people and their behaviors and opinions. Occasionally, we might be interested in understanding what they produce and to see how this might change over time. *Content analysis* involves the study of artifacts, usually written (such as diaries, newspapers, blogs, biographies, Twitter messages, Instagram photos, and official documents) but also visual and other forms of communication. It is based on developing a way of coding and classifying the information (the content) in the documents or media being studied. Content analysis is also used in coding answers to open-ended items on questionnaires (see Chapter 6 for a discussion about this). It includes qualitative methods and sometimes the quantification of information. For example, we can study the content of radio talk shows and code the broadcast in terms of how liberal or conservative the views of the host and the callers are, as well as tabulate the percentage of men and women who air their opinions. Or we might be interested in researching the images of gays and lesbians in television shows and do both a quantitative analysis of the number of characters and a content analysis of how they are depicted in these shows: Are they portrayed in stereotypical ways? What are their issues? Are they shown in relationships or isolated?

Let's say we are interested in evaluating online blogs about global climate change. We would develop a sampling scheme, read the postings and construct coding categories, and then evaluate the blogs in terms of those codes, perhaps looking for biases in language when discussing scientific studies and what positions the blog writers take about global warming issues. Sometimes this work involves searching archives and other *historical* documents for information about environmental concerns in newspaper editorials from previous pre-Internet decades, for example. *Comparative research* could also include reviewing blogs and climate change laws in different countries.

Big Data and Meta-Analysis

With the increasing power of large computers, newer kinds of data analysis and research methods have emerged. *Big Data* refers to the collection of huge amounts of information gleaned from social media, business transactions, online searches, and databases now more easily stored in large computer memory banks. Audio, e-mails, videos, purchasing information, and even "likes" you make on Facebook or Instagram, for example, stream into these computers, often in real time, and are instantly analyzed to find connections, patterns, and trends.

Although individual pieces of information might not indicate much, predictions are improved when they are combined with thousands of others. Studying these relationships among large data sets has led to improved business models; epidemiological findings about diseases and treatments; predictive algorithms suggesting the next song, movie, or book you would like; and an understanding of variations in trends among different gender and ethnic groups. Yet working with such large data sets has its limitations since there may not be any control in the methods used to collect the information, small differences in very large samples can artificially seem to be significant, and nonrandom sampling may limit the generalizability of the results to other populations.

Can these large collections of data provide explanatory information, or are they limited to descriptive and exploratory research? Ethical issues of privacy related to the collection and storage of information about you are particularly important to consider when Big Data are accessed. With computers becoming more powerful, would it eventually be possible to drill down through aggregated data and identify individuals and their personal preferences? What if even generalized data, such as differences in ethnicities or sexual orientation, are used to determine eligibility for insurance or a job? As additional data are combined, the accuracy of predictions made and the unethical use of findings can increase. Who will monitor the collection of these data and the distribution of information derived from the analyses?

Because of large computers, *meta-analysis* research is also possible. This method involves statistical analysis of data from multiple studies focused on the same topic. Advanced statistical models are applied to data pooled from a range of studies using systematic review of their methodologies and findings in order to seek patterns and provide more statistical power and precision in interpreting the results. This technique is especially useful in epidemiological research and the testing of medicines and new treatments.

But like Big Data, the quality of the analysis depends on the quality of the research methods used in the original studies that are being combined. Decisions have to be made to determine which studies to include or exclude in the meta-analysis without bias. The criteria for selecting the articles must be explicitly described. While doing Big Data research or meta-analysis is beyond the scope of this introductory textbook, the tools to evaluate the pooled studies and big databases depend on the same methods discussed in the chapters that follow (such as reliability, validity, questionnaire design, sampling, and statistics).

Social Network Analysis

Not all research is focused at the individual level; more and more, researchers are interested in the interactions among people in organizations, communities, and other social groupings. *Social network analysis* (SNA) studies the patterns of connections using mathematical and visual methods, all made possible thanks to powerful computers. It develops graphs and statistical information about which people or groups are central to the communications flow and structure of an organization or community. How are others then linked to these key people or nodes, how many connections do they in turn have, and what is the structure of these relationships? Rather than just looking at individuals and their attributes as survey research tends to do, social network analysis emphasizes the statistical and visual modeling of individuals' ties, thereby developing a complex mapping of relationships making up the social, economic, and political structures of a community, organization, or even a computer network (see Hanneman and Riddle 2005).

Quantitative Survey Methods

Many times, researchers are interested in describing the number of people involved in certain behaviors or holding specific beliefs. Some want to make use of archival data that have been collected by others over the years, such as all the information gathered during a census. Others like to focus on explaining the way people behave or predicting how they might act in the future. Underlying all these is an assumption that social

phenomena can be systematically measured and scientifically assessed. For many of these kinds of questions and assumptions, the use of quantitative methods is most appropriate, as we have been discussing in this book.

Some of the techniques involved in content analysis, experimental designs, archival research, meta-analysis, social network analysis, and in-depth interviewing use quantitative approaches. Structuring questions for an interview, developing categories and variables for coding printed content, and counting responses and observations are just some of these techniques. An easy way to remember the differences between quantitative and qualitative research is to think about how someone reviews a movie. A reviewer who goes into detail about the acting, the camera work, the screenplay and dialogue, and the grand meaning of the story is providing a qualitative content analysis. A reviewer who simply says it's worth three stars or two thumbs up has given a quantitative response with fewer details but a convenient summary evaluation.

Quantitative methods typically involve writing questions for surveys and in-depth interviews, learning to quantify or count responses, and statistically (mathematically) analyzing archival, historical, or our own data. A common form is a self-administered questionnaire. Questionnaires are particularly suited for respondents who can read, for measuring people's attitudes and opinions, and for getting a very large number of respondents too difficult and time consuming to observe with qualitative methods.

Doing survey research well is the theme of the rest of this book. It focuses primarily on questionnaires with samples of people, but many of the techniques described apply to other situations and methods. The chapters of this book are arranged in the order typically used for generating a research design and writing up the results for presentation:

- Find a topic to study.
- Review the previous literature and research.
- Develop research questions and hypotheses.
- Specify how to measure (operationalize) the variables in your hypotheses.
- Design a questionnaire.
- Develop a sample.
- Collect data.
- Prepare a codebook and data file.
- Analyze data statistically.
- Write up and present the results and conclusions.

The first stop on the research journey is learning to create good research questions and generate problems to evaluate. In the next chapter, we look at ways to find ideas for using the scientific methods of quantitative inquiry.

REVIEW: WHAT DO THESE KEY TERMS MEAN?

A/B testing
Biased questions
Big Data
Causation versus correlation
Comparative research
Confirmation bias
Content analysis
Describe, explain, explore, evaluate, and predict

Empiricism
Experiments
Focus groups
Generalizations
Limited sampling
Meta-analysis
Needs assessment research
Objectivity and intersubjectivity
Pseudoscience

Qualitative research
Replicable procedures
Research design
Selective attention, perception, and retention
Social network analysis
Systematic methods
Triangulation or mixed-methods research

TEST YOURSELF

(Answers for "Test Yourself" Exercises in Each Chapter are in the Appendix)

1. What three things must be decided before you can conclude that there is a cause-and-effect relationship?
2. Using these three factors, what kinds of questions would you ask about autism or, for that matter, about storks and birthrates, as described in Box 1.2?
3. What other elements of everyday thinking are evident, and what scientific thinking is needed to look at the relationships described in Box 1.2?

INTERPRET: WHAT DO THESE REAL EXAMPLES TELL US?

1. What are the errors in everyday thinking in the following comments posted on an online blog focused on educational issues?
   a. "As a parent, I am glad that private and parochial school teachers are not required to go through the training given to public school teachers. If they did, those schools would have the same problems and bad education public school kids face."
   b. "National standardized testing will lead teachers to teach only what is necessary to pass the test. This isn't what teaching is all about."

2. For each of the following academic studies, on the basis of just what is stated here, say whether the main goal of the research is to describe, explain, and/or predict:

   a. Poirier et al. (2016) investigated the social contagion effect of anxiety symptoms among Canadian children's friendships: Does having anxious friends lead to anxiety in these elementary school kids, independent of any genetic contributions?

   b. Pew Research Center (2017b) conducted a national survey of 1,040 adults to examine their cybersecurity habits and attitudes. This survey found that a majority of Americans have directly experienced some form of data theft or fraud and that a sizeable share of the public thinks that their personal data have become less secure in recent years.

   c. Milosavljevic (2017) was interested in the perception of well-being and happiness among Serbian gay men which originates from their online communication on gay dating sites and social networks. The study looked at the connection between online identity and health disclosure and how participating in online communication contributes to a sense of belonging to a community and related well-being.

CONSULT: WHAT COULD BE DONE?

One of your friends tells you that she heard from a friend that students living in Gryffindor Hall have the highest grades on campus and suggests that you should move there next semester. When you do so, your grades will go up, she says.

1. How would you respond to this statement?
2. Is this an example of everyday thinking or of scientific thinking? In what ways? What would be the purpose of doing some research on this?
3. How would you respond to the cause-and-effect statement your friend is making?

DECIDE: WHAT DO YOU DO NEXT?

This exercise continues in each chapter throughout the book and builds on the answers you provide at the end of the chapters. Taken together, your responses will form a complete research design and can serve as a model of how to develop a research proposal. If you have a different topic you want to research for a project, simply replace the sentences about a friendship study with your focus. The questions asked in each chapter apply to most research topics.

   You are invited to conduct a study on how people develop and maintain diverse friendships. With the widespread influence of Facebook, Twitter, and Instagram,

what does it even mean to say you have friends or that you "friended" someone? The goal is to understand similarities and differences among different people. For example, do men and women have the same values about the meaning of friendship? How do people of various ethnicities and cultures maintain their friendships? Is age an important component of friendship?

1. Give examples from *everyday thinking* that you have heard about friendship formation. What are some errors in making conclusions on the basis of these everyday examples?
2. Provide examples of studies you could do whose purpose is to (a) *explore* friendship formation and maintenance, (b) *describe* the relationships between friendship and people's characteristics (gender, age, etc.), and (c) *explain* the relationships. What kinds of questions would you ask and how would they differ for each type of study?
3. Determine what more you would need to know to declare there is a *cause-and-effect* relationship between friendship formation and specific characteristics (demographics).

For additional examples, resources, and "test yourself" questions, go to http://doingsurveyresearch.wordpress.com/

2

FINDING IDEAS
TO RESEARCH

Imagination is more important than knowledge. For while knowledge defines all we currently know and understand, imagination points to all we might yet discover and create.

—*Albert Einstein, physicist*

LEARNING GOALS

Discovering topics to study by searching for research ideas and finding existing studies is one of the goals of this chapter. Learning to write a good literature review is discussed, especially in the context of using theory to guide your research. The chapter also raises the ethical issues involved in doing research. By the end of the chapter, you should be able to search for topics in the library and in computer databases, write a coherent and focused review of the research literature, and note the ethical concerns various kinds of research topics might raise.

You've just been handed an assignment by your boss to gather data for a work-related project about customer satisfaction using a self-administered questionnaire. Or maybe a professor is asking you to develop a research topic for your education major honors thesis. Now what do you do? Where do you even start? You're probably thinking: I wish I had written down all those ideas I've had over the years because now I can't think of anything to study! Figuring out what to research or how to begin an assigned project can be a daunting task for many people. For some, curiosity generates too many broad questions. Others begin with too narrow an idea that goes nowhere beyond a simple query. What follows are some strategies that can be used to develop a research agenda that is meaningful and focused and that can help in creating a successful research design.

GENERATING TOPICS

Ideas come from many sources, and part of any research design is translating those ideas into reliable and valid ways of measuring them. Developing an idea that is carried out to completion in a scientific research program is a powerful and creative process. To experience taking a topic, constructing research questions, and collecting evidence to support or refute your ideas can be exhilarating. And the first step—generating researchable topics that are unique ideas—is often one of the most innovative parts.

Curiosity and Experience

Where do we get ideas and topics for research? One way is with our own curiosity. Look around. Listen attentively to what people are asking, and see what they are doing. Be conscious and questioning of your own experiences and focus carefully on what you read about or hear in everyday encounters. Do these lead you to wonder about something in particular? For example, you learn in a linguistics class that women's body language when listening to others speak appears to be different from men's body language. Are women nodding frequently, providing more verbal signals, and smiling more than men? Or perhaps you notice that voting patterns vary among people from different social classes and ethnicities. Maybe you overhear students complaining about the amount of time they spend posting photos on Instagram. Or you might just simply wonder if studying so much really makes a difference in the grades you get.

One of the first ways, then, of generating a research topic is to use your own curiosity and experiences as a source for further inquiry. But be careful: Personal experiences can result in either a topic so broad that it would be impossible to study ("are men really different from women?") or so narrow that it would be difficult to go beyond a very limited set of questions resulting in the most specific and trivial of findings ("which is the favorite Beatle of my friends' parents?").

Assignments, Theses, and Grants

Of course, another way to find a topic is to be assigned one by a teacher, a supervisor, or some agency offering research grants. Perhaps you get a notice (called a request for proposal or application, or RFP or RFA) stating that funding is available for research on alcohol use among the elderly. This sparks your interest, and you begin to develop some questions that you feel need answering in this area.

Similarly, you might be asked to do a thesis for completion of a degree in political science, for example. Reflect on the courses you have taken and see if the books you

have read or the lectures you remember raise questions that need some systematic analysis. You know that the topic has to be in the area of political issues, so you decide that voting behavior among "millennials" is something that interests you. Studying voting behavior is quite general and not focused yet, but it is a good start.

Consider a situation where you are an employee at a social service agency that specializes in working with the homeless. The agency is required to file a report at year's end about the services it provided, the kinds of people who have been assisted, and the strengths and weaknesses of the program. Your supervisor assigns you to develop a questionnaire that can be used to assess these outcomes. You may not have a choice in the topic, but you do need to make some important and creative decisions about the research design and the kinds of issues to be covered. Again, you start out with a general idea or topic, and you now need to begin focusing more specifically on its multiple dimensions.

Other Research

By reading published academic research, you learn what has been done already and what needs to be accomplished. An *academic article* is a paper that has been reviewed by peers and published in a journal read primarily by researchers and scholars. Normally, these are original reports of research. Such publications as the *Huffington Post* online newspaper, *The New York Times*, or *The Economist* may be sources for original information, but they often summarize and report on research published elsewhere. In such cases, they are secondary sources, not primary ones like academic journals. Your search for further information about your topic should begin with the primary literature of original research.

Sometimes your goal is to *replicate* studies. In such cases, prior research gives you the questions, methods, and information you need to redo the study with a similar or perhaps different sample. An important aspect of science is the ability to repeat results under similar conditions or with different respondents.

Another goal might be to fill a gap in the research by focusing on what hasn't been done. Most published articles conclude with what the researchers couldn't do and with suggestions for additional studies. Sometimes they even suggest particular lines of research that their project has generated and that need further analysis (see Box 2.1). Not only are academic articles a good source for a topic, but they also give you direction once your topic has already been selected. Reviewing the published literature continues even after you design your study; it helps immensely when analyzing data, interpreting the outcomes, and writing up the final report.

Another way of finding research ideas is to make use of *secondary* data sources, such as census data, political polls, or the General Social Survey, some of which are

BOX 2.1
USING RESEARCH TO GENERATE IDEAS

Studying how official sources and dramatic events can influence framing of political issues by news media, Speer (2017) analyzed *The New York Times*' coverage of the Iraq War. His data demonstrated that journalists' portrayal and framing of the war shifted after a dramatic bombing event and moved away from the White House's views. Like most peer-reviewed publications, Speer includes a detailed literature review which could provide references of articles and research related to your topic. Always check the bibliographies in academic journals to uncover key articles and important books you'll need for your own work.

Another good way of generating ideas for a study is to review the suggestions for future research and limitations that are usually presented in scholarly publications by the authors. For example, Speer (2017) notes that his analysis was limited to *The New York Times* over a six-month period, suggesting that others might review other news media and for an extended time period. He also reinforces the importance when doing communications and media research on the framing of political coverage to distinguish statements made among outside sources, journalists, and officials. In addition, Speer (2017: 299) adds "my study indicates that future communications research would benefit from comparing coverage before and after dramatic events as a way of assessing the influence of events on news coverage."

By carefully reading research studies and their literature reviews, limitations, and suggestions for further research, you should be able to develop some important ideas, concepts, variables, and hypotheses for your own studies, dissertations, and reports.

available without a fee through the Internet. These sources are called secondary because you are not the primary or first person designing the study or collecting the data. By reviewing the variables and questionnaires from available data sets, you might be able to create your own research project or develop a new way of interpreting earlier findings.

The best data sets have the advantages of probability random sampling (discussed in Chapter 5); larger comparison groups across various ethnicities, regions of the country, international locations, and other characteristics; and reliable and valid questionnaires that have been tested and professionally developed. Yet the questions might not be as directly relevant as you would construct for your project, and the data sets might not have enough questions for your particular research goals. Furthermore, the subsamples sometimes aren't large enough for your purposes. But reviewing the methodology and questions used in the collection of publicly available data is a good way of finding research topics and developing hypotheses to study.

Serendipity

An idea can also derive from the research we are already doing. It is not unusual to discover a finding that was totally unexpected; this is what is often called *serendipity*. By accident, a result that wasn't anticipated jumps out, and we become intrigued to figure out why this occurred. This leads to a new line of research in an attempt to study this serendipitous finding in more depth. For example, a study is designed to assess the relationship between dropping out of college and grades. Several items of information are gathered during the study, including sex, ethnicity/race, social class, outside work commitments, course load, and major. In the process of reviewing the data, a researcher notices that other items such as whether a student was on academic probation, received low grade warnings, and had meetings with advisors might be interesting to analyze.

Unexpectedly, after further data analysis is completed, it's discovered that some students who received low grade notices tended to drop out rather than get their act together and study harder. Low-income students were more likely to see these warnings as statements verifying that they were not "college material" and could not make it at the university, as they had secretly feared all along. They tended to leave college more than the middle-class students who received the notices and used them as a "kick in the butt" to work harder. Because studying low grade notices wasn't the main focus of the research, it is not possible to go beyond this anomalous finding, but these results can lead to the development of another research project on how probation and low grade notices affect various ethnic/racial, social class, and gender groups differently.

Whether from astute observations of the world around you, an assignment at work or school, serendipitous findings in another study, or incentives from a funding agency, a topic is generated and the process of refining it to a more manageable project starts. At this point, the primary task is to carve out something that is focused, informative, unique, and fun to do. After all, if you don't enjoy the topic, you are not going to be motivated to do a thorough job!

SEARCHING FOR RESEARCH

A good way of figuring out if an idea or research topic is still too general or too specific is to type some key words into a computer search of resources. You can always use one of the Internet *search engines* (such as Google), but this will turn up lots of information (some of dubious quality) that is not likely to serve the needs of scholarly research. Imagine, for example, how many millions of responses you'll get if you search for "alcohol and elderly" (I actually got almost 60 million!) (see Box 2.2 for more tips and resources to aid your online search).

BOX 2.2
LIBRARY DATABASES

There are many resources in the library to guide us in searching for books and articles on specific topics. They are typically available through computer databases, which are lists or collections of information about books and articles organized by such various fields as name of authors, title, year of publication, and key words about the topic. Most of these resources rely on a system using Boolean logic to search for information. *Boolean logic* is based on dichotomous, or two-category, questions: Is it true or false? Is it an odd-numbered playing card and a red one? Is it a heart or a diamond? The logical operators "or," "and," "and/or," "less than or equal to," among others, form the basis for the search.

For example, in its simplest form, if we are interested in finding an article about attitudes toward capital punishment among teenagers, then we would search for "capital punishment AND teenagers." Both pieces of information need to be present in an article for it to be selected by the search engine. If we inadvertently typed "capital punishment OR teenagers" then we would get every article written about teenagers and every article written about capital punishment. Research about elderly people's attitudes toward capital punishment would appear, as well as articles about teenagers and movie attendance, for example. Checking the "Advanced Search" help feature often provides better searching options.

In addition to using something like Google Scholar, there are numerous databases available specific to various disciplines. They include *PsycINFO* to search the major psychology journals, *Education Resources Information Center* (*ERIC*) for articles about education topics, *Sociological Abstracts* for sociology, *Worldwide Political Science Abstracts* and *Public Affairs Information Service* (*PAIS*) for government and political science areas, *EconLit* for economics, *Anthropology Plus* and *Human Relations Area Files* (*HRAF*) for anthropology, and *MEDLINE* for medical research. LexisNexis is a great reference for finding newspaper, magazine, and trade publication articles. More comprehensive databases like JSTOR search hundreds of journals in different fields simultaneously.

Your goal at this point in the research journey is to search for published academic studies on your topic. Using library *databases* and entering the relevant information generates lists of academic articles and studies on your subject. Still, you must narrow your focus. Even when I limited the search of "alcohol and elderly" to published articles using Google Scholar, I was able to narrow the results down to a still-unmanageable two million. But also be careful not to select too specific a topic such that prior research cannot be found or the outcomes will not be interesting beyond one specific answer (e.g., "Did women in Florida under the age of 25 vote in the last election?"). Perhaps uncovering just a few key articles or books on the topic will assist you in narrowing your search.

You also have to begin focusing on what you really want to know; don't ask questions for which you already have the answer. For example, what is it that you actually

want to learn about voting behavior and millennials? How frequently they vote, for whom they vote, ethnic/racial and sex differences in party registration? Once you decide on some other categories of interest, search again using several additional key words, for example, "voting behavior," "youth," "gender," and "political party," and see what happens now. Ideally, a more reasonable number of articles show up, and you can begin the next phase of reading and analyzing the studies.

Once you have found some well-designed research and academic articles on your topic, a review can provide additional concepts and ideas for further focusing your study. The articles also list other publications to find. Look at the bibliographies and references in these journals and see if there are some articles or books regularly cited. These might indicate a classic study in the field that is important to read, or it may simply provide a new set of articles you hadn't discovered in the database searches.

Searching the academic databases can be followed up with a search of more popular newspapers and magazines, the Internet, and other media to help you understand the popular culture's take on the subject and to suggest other avenues of research. But be careful: A lot of what is in the nonacademic literature may represent inaccurate reporting of results, personal opinion, anecdotal data, poor sampling strategies, pseudoscience, and the other pitfalls of nonscientific reasoning discussed in Chapter 1. You need to develop critical thinking tools in order to discover the quality material when searching in this era of information overload (Nardi 2017). Journalism sometimes sounds like social science, but it rarely does more than provide information. Analysis, theoretical interpretation, and systematic evaluation are what make social scientific approaches different from popular culture writing.

LITERATURE REVIEWS

At this point, you should have narrowed your focus and found many articles and books on the subject you are studying. This doesn't mean you have arrived yet at a final topic or set of questions. Evaluating the previous research is an important step in developing a high-quality study. Not only does this provide further ideas, but it also generates a set of questions, concepts, and methods relevant to researching your topic.

When reviewing the literature, it is essential to develop a detailed database, using index cards, computer note-taking programs, or simply sheets of paper in a notebook. Plan ahead and prepare a list of information you need about each publication reviewed. The complete title of an academic article or book, its authors, the publication date, page numbers, and the volume and issue numbers are just some of the items required when writing up a bibliography or list of references in a final report (See Box 2.3). Review the "References" section of this book to see one example of the format and items needed for a literature review bibliography.

BOX 2.3
CREATING A DATABASE OF REFERENCES

1. As you search for and read relevant books and articles, keep track of these important elements that go into your bibliography, footnotes or endnotes, and references:
   a. Title of article or book
   b. Author(s)
   c. (For an article) Journal name, volume, issue, page numbers, date
   d. (For a book) Publisher, city, date
   e. (For a document or article on the Internet) In addition to the title, author(s), and name of the online publication, be sure to copy the URL (the http:// website address), date written, date when the item was retrieved.
2. While reading an article or book:
   a. Summarize key points (such as who or what was sampled, methods used, major variables, questionnaire items, and main findings).
   b. Write down exact quotations with page numbers or paraphrase relevant information and findings you need to support your research.
   c. Record your own opinion about the quality of the research, how well the article or book is written, and the importance of the results or theoretical positions.
3. Once you have put together a list of references you reviewed for your project, check with the style format used in different fields and publications (such as MLA, Chicago, or APA styles). For example, look at the "References" at the end of this book for a format used by many sociology publications.

For each academic article or book, attend to the methods used: Who or what is sampled and how many, what questions are asked, what are the variables, how are they measured, what statistics and data analyses are used, are the conclusions linked clearly to the data collected, is there a discussion of the limitations of the study and suggestions for future research? What major findings result from this research? The material in the rest of this book provides information you should use to be a critical evaluator of the methods, sampling, statistics, and overall research design of the studies you read, in addition to teaching you how to do your own survey research.

Once you have assessed the studies, the next task is to decide if you want to replicate any parts of them. If so, you might consider using the same measures (such as questionnaire items with the permission of the authors) or modifying them if you are duplicating the study with a different sample. If you feel something is missing from these studies, pick up on something the authors said they wished they had done, or

see if the results suggest a further line of research to take. Then consider which aspects are worth keeping and which should be changed or expanded. For example, if you believe that studying students in an introductory psychology class was a weakness in an otherwise interesting study, then choose a better sampling strategy. If you feel the questionnaire items written for a study on satisfaction in the workplace did not accurately capture what represents satisfaction in the specific organization you are studying, then modify the questions for your particular sample. Remember, though, that comparisons with other research cannot be exact unless the same measurement tools and methods are used. But this is primarily important only if comparison or replication is your main goal.

A good literature review is necessary to help design the research. There is no need to study something that has been done over and over again unless you have a unique perspective on the subject. A good literature review is also important in assisting you in becoming more knowledgeable about the research subject. Too often, people jump into a topic and fail to understand the range of issues involved, ignore important cross-cultural or subcultural differences that might impact a study, and make the same methodological mistakes others have. Critically evaluating the historic research record contributes to an expertise that becomes relevant when presenting the findings, contextualizing the research, and responding to queries about the work.

There are several ways of reading the existing academic literature and writing up your review of the key research articles and books. When reading the material that will become part of your literature review, remember that not every article you find is relevant. It is not necessary to write a summary for each item you read, especially if it is not primary research. You should not summarize a study that another author has reviewed in her or his research if you haven't yourself read the original study. The author may not be reporting it accurately or may be selectively describing aspects relevant to his or her research and not yours. Try to read primary sources, not only secondary sources.

While reviewing the literature, focus on the elements you are most interested in evaluating. When you are seeking information about how to measure your variables, for example, compare studies that use different scales and questionnaire items and evaluate the differences. For example, one survey might have a question asking how many years of schooling the respondent has, while another study might ask the education question in broader terms like "elementary school only," "high school graduate," "some college," and so on, as explained in Chapter 4. Other studies might be used to assess the strengths and weaknesses of various sampling strategies (like random sampling versus convenience sampling, as Chapter 5 discusses). Every article or book you read may not always provide information for all the elements of your study, so read selectively and critically.

Use your research questions and goals as a guide to which articles or books are most important in providing you with contextualizing information. Remember, the purpose is not to overwhelm the reader with every piece of research ever done on your topic. Rather, the goal is to provide you with guidelines for your research design and to situate your research in a particular theoretical or research context for the reader.

For writing up a literature review, one good organizing structure is to begin with a brief overview summary of your main research goals, focus, and theoretical perspective. Then, using your research questions, develop a set of categories or themes to discuss the prior literature most related to your goals. Reading the literature involves a type of content analysis in which you seek out thematic links among the articles and books and organize the information into those themes. Reflect on the readings and uncover common threads and differences that run through the work. For example, in a review of the academic literature on friendship formation among elementary school children, you could summarize the studies into categories of age, gender, race/ethnicity, and social class. Or you might notice that the best research focuses on parental involvement in friendship development and the emphasis on value congruence among friends, so you organize your literature review according to those topics. Your goal is to analyze the research that has been done, raise questions about what may be missing from the prior research, and make a case that your research will extend, revise, or replicate what has gone before.

Some people prefer to write a literature review by summarizing each key article or book, one after another. These kinds of reviews are like annotated bibliographies that describe the goals, methods, and results of each study as related to the overall topic of your research. However, a literature review should have some analysis of the material and not just be a descriptive listing of research studies with brief summaries of the findings. A review should consider specific themes that emerge from the research that has been done and be organized according to the issues, variables, and theories you are using. How generalizable are the results of the past research? Do the findings apply to the sample your study is using? Are certain variables and measures more valid than others for studying your topic? What theoretical perspectives guide previous studies, and how do they relate to your research goals?

When you are summarizing others' research, it is best not to use lengthy quotations directly from the articles or books. Try to paraphrase the information in your own words; use direct excerpts only when necessary to clarify meanings, provide complex ideas, or display the author's unique phrasing and interesting wording. But be careful in summarizing others' ideas and quoting their findings so as not to engage in *plagiarism*. It is ethically responsible to learn how to properly cite excerpts from someone else's work and not pass them off as your own ideas and words. Look carefully at the research you are reading as a model of how to present quotations and to reference books and articles in various disciplines.

When you report someone else's ideas, words, or research findings, you must tell the reader whose they are by using endnotes or in-text referencing. Otherwise, you are giving the impression (intentional or not) that these ideas, words, or research methods are your own creations—in effect, stealing someone else's work. When you directly quote someone else's words, you must also provide the reader with the page number where the phrase appears. In-text citation style is used throughout this book and is discussed further in Chapter 10, about writing up research reports.

The best way to learn how to do a literature review is to notice carefully how the academic articles you are reading do them. Read other research not just to get ideas directly related to your work, but read the literature also as a guide about how to write up your research reports. Consider this example from a study that seeks to understand the relationship between fear of crime and television viewing. Kort-Butler and Hartshorn (2011) open the literature review by stating the main goals of the research and then move into a review of previous research. In a section labeled "Literature Review," they organize other published research into three categories: (1) "Television Exposure and Fear of Crime," which highlights research findings on fearfulness and types of programs watched; (2) "Crime Programming as Infotainment," which presents articles about this genre of television crime programs; and (3) "Crime Programming as Ideology," which discusses various theories focusing on research about how "the media, television in particular, is a way through which cultural images about crime are disseminated and reinforced and through which criminal justice policy debates are shaped" (2011: 40). Notice that the authors did not simply summarize a set of academic articles in any random order but instead conceptualized and organized past research studies and theories into three meaningful categories that highlight the central themes and issues related to the key variables of their study on the fear of crime and watching crime-type television shows.

THEORY AND REASONING

Theories are an important source of research ideas; they typically underlie high-quality research. A *theory* is a set of statements logically linked to explain some phenomenon in the world around us. If a theory is used to generate research ideas about certain behaviors and attitudes, then we are using *deductive reasoning*. Homophily theory, for example, posits that people tend to form social friendship ties with others who are perceived to be similar to them. On this basis, you want to study whether first-year students at college start to make friends with other students in their residence building who seem similar to them in political and social values. You have deduced a specific research question from a larger theory. On the other hand, if a set of observations or empirical data is used to construct a general system

of linked statements, then we are engaging in *inductive reasoning*. In this case, after many observations of students hanging out in the cafeteria and their seating arrangements, you end up with your theory of "birds of a feather flock together." You have used inductive reasoning by going from the particular to the general. Most research involves both processes: A review of the literature tells us what theories and explanations we can use to deduce specific research questions that are then used to get data that form the basis for inducing or modifying a theoretical perspective to explain what was observed and measured (see Box 2.4 for a classic example of deductive and inductive reasoning).

A major outcome of investigating a topic through a critical literature review is the discovery of theories and the development of a set of concepts and questions that can be used to test those theories or to create new ones. This set of questions or hypotheses forms the framework of a research design. Learning how to write hypotheses and develop good research questions that can be translated into reliable and valid measures is the focus of Chapter 3.

BOX 2.4
DEDUCTIVE AND INDUCTIVE REASONING

Emile Durkheim's *Suicide* (1951 [1897]) is a classic study in which Durkheim *induced* a general theory about social cohesion and how connected people are to communities, based on data collected throughout France in the late nineteenth century. Across different sets of people, those who belonged to more cohesive groups had lower suicide rates, he theorized. Durkheim did not develop a psychological theory about why any one particular individual commits suicide, but rather a sociological one based on specific *aggregated* information (data pooled from a collection of people). He was interested in explaining *patterns* of behavior across groups and the variables that contribute to an understanding of those patterns. By linking these observations logically into a coherent system of explanation, Durkheim induced a theory about various types of suicide, like egoistic suicide, which is related to a lack of social integration.

As others have done for over 120 years, learning about Durkheim's theory can generate new research questions. Perhaps a study on how people who have large friendship networks tend to be healthier in mind and body, or how a lack of community and shared values contributes to increases in alienation and crime, can be derived from Durkheim's ideas. Going from a more general theory of social cohesion and suicide to a specific set of topics and hypotheses for further study on community cohesion and crime illustrates how research ideas can be *deduced* from theory. Durkheim's contribution to the development of sociology was this creative linking of theory and empirical data.

THE ETHICS OF RESEARCH

When you have selected some specific and manageable topics and ideas to study, the next step is to design a research plan. As you do so, it becomes important to ask whether the topic and the act of gathering information are worth the impact they may have on who or what is being studied. You may have generated a wonderful set of questions and topics, but if they put people in difficult and stressful situations, the research should not go forward. In short, before the study begins, it is crucial to reflect on the ethics of doing research about a chosen topic, with the measures you intend to use, under sponsorship (and restrictions) from the agency providing funds, and with the sample of people or institutions you plan to survey.

Every major academic and professional association engaged in research has developed a *code of ethics* to guide the collection of data. Every institution conducting research also sets up an *institutional review board* (IRB) to evaluate the proposed research using those codes before the studies be funded or can start. When human subjects are involved, the guidelines are especially important.

In brief, codes of ethics state that participants should not intentionally be *physically or mentally harmed* and their *right to privacy* must be respected. Potential for harm and threats to privacy arise in several areas and situations, including in the process of sampling, measuring, and analyzing data; disseminating the findings; and using the data. Consider for a moment what the ethical and privacy implications are when Big Data is collected, analyzed, and distributed. As described in later chapters, it is unethical when researchers deceptively use inappropriate statistics to distort the findings, distribute portions of the study favorable to their beliefs or the sponsoring agency while concealing unfavorable parts that do not support their ideas, use the results in ways for which they were not designed, and reveal information about specific respondents who were assured confidentiality.

Confidentiality needs to be emphasized when information identifying respondents can be linked to their specific answers and is revealed only to the researchers for the main goals of the project. *Anonymity* can be ensured when there is no way of connecting any particular identifying information with the individual person completing the survey. Respondents do not give any names or code numbers linked to their names. Confidentiality is not the same as anonymity: Anonymous information is always confidential since it can never personally be traced back to anyone, but confidential information is never anonymous because the researchers usually know who completed the survey.

Although it is not always clear-cut in advance whether a research topic and the questions asked will invade people's privacy or cause mental or physical danger, it is important to discuss the potential impact the study might have on those involved. This is essential in order to eliminate any situations where intentional harm could

occur and to inform people what is going to happen in the study so that they may determine how much loss of privacy is at stake and decide whether or not to participate. This is what is called *informed consent*. For example, it would be ethical to tell participants that a questionnaire contains items related to alcohol use and family issues and that they are not obliged to complete items that might disturb them. In this way, should those with a painful family history of alcoholism feel uncomfortable about the project or answering certain questions, they would have the chance to *opt-out*. Of course, this might affect the outcome of the study because it alters the nature of the sample responding, but ethical concerns take precedence.

Similarly, volunteers for research must participate of their own free will. Being part of a captive audience—whether in a classroom or a prison—can be a form of coercion unless there are opportunities to decline involvement. For example, the Code of Ethics for the American Sociological Association (ASA) states, "When undertaking research at their own institutions or organizations with research participants who are students or subordinates, sociologists take special care to protect the prospective subjects from adverse consequences of declining or withdrawing from participation" (for a complete copy of the code, go to www.asanet.org/membership/code-ethics). However, *voluntary participation* (an *opt-in* approach) can affect the outcome of a study if the sample ends up composed only of respondents who are willing to get involved. They may be very different kinds of people from those who declined, and depending on the research topic, this can result in distorted findings.

When there is any danger of physical or mental harm, consent must be given, usually in writing, and it must not be obtained through any form of coercion or misinformation about the project. Researchers must balance the amount of information they need to give with the amount necessary for respondents to arrive at a decision. Sometimes disclosing too much about the research can affect the outcomes of the study. Knowing you are part of the group getting a fake (placebo) vitamin, for example, may affect the results. In no case should the researchers *deceive* the participants about the project. Of course, informed consent may not be needed if the questionnaire does not have the potential for harm, or at least no greater harm than what occurs in everyday social interactions, for example, when asking people anonymously about their favorite books, movies, and other hobbies. Occasionally, *debriefing* people (informing them about the complete objectives and methods of the research) after they participate in the study is a good way of providing information that, if given at the beginning, might have led to biasing the results.

For all research, we need to determine ahead of time whether a project has any potential harm, how we will minimize it if there is any, what mechanisms are in place to guarantee the confidentiality of the data gathered, what benefits the research can have, who benefits from the research, and how much we will tell the participants before and

after the study. This is the kind of information typically presented to an institutional review board that determines whether the design of the study (the sample, measurements, outcomes, uses of the data, consent, and privacy concerns) meets the ethical standards of the profession and sponsoring institution.

Other Ethical Considerations

Some institutional review boards hold that learning how to do research by developing questionnaires for *class projects* may not require human subjects' approval when

- the participants are informed that the survey is part of a class assignment and list the course and instructor who will see the data,
- the results are not reported beyond the classroom in any public forum or publication,
- a statement is included to remind the respondents that their participation is voluntary and that they may skip questions or stop at any time,
- no sensitive information is collected that can cause mental harm or discomfort in completing the questionnaire, and
- questionnaires are anonymous.

Publicly available data or data that cannot be linked to subjects' identities are also typically exempt from human subject approval by institutional review boards. Because policies vary and change, before you proceed with any research, inquire about the guidelines and code of ethics in effect at your institution or sponsoring agency.

Specific types of research methods may require raising other ethical questions in addition to the standard guidelines presented earlier. For example, with Internet surveys, ways of contacting potential respondents should reflect both legal and privacy guidelines that restrict sending unsolicited e-mail ("spam") to participate in a survey. Potential respondents should have a reasonable expectation that they might be contacted for surveys, hold the option of declining participation, not be minors who would normally require parental permission to participate, and be able to have their e-mail addresses easily removed from the mailing lists. Organizations or individuals who send e-mail to recruit respondents should provide legitimate return e-mail addresses and information about the sender that can be verified.

Problems in sampling are a major concern with Internet research. Given uneven distribution of computer access based on age, income, and ethnicity/race, researchers must be ethically aware of the potential for making *generalizations* about a population based solely on responses to online surveys. Furthermore, the storage of e-mail responses to surveys and the potential for linking answers or direct quotations to someone through e-mail addresses need to be determined in designing Internet surveys.

Another issue facing Internet research is to consider how public the information people provide in discussion boards, blog comments, Twitter, Facebook, Instagram, and other social media really is. Although most of these sites are publicly accessible, people often participate as if their responses were private to other members. Should the participants writing comments on someone's blog be informed that their words are being monitored and analyzed by a researcher? Should the researcher pose as a member of the Internet community being studied or not even announce a presence as a lurker? How do you get informed consent from people who wish to remain anonymous and who may give false information about their real age, sexual orientation, and ethnicity?

A report on Internet research ethics for the American Association for the Advancement of Science (Frankel and Siang 1999: 9) states,

> Guidelines in the physical world allow for deception in the study of human phenomena, providing that the research has considerable prospective scientific, educational, or applied value, that there are no alternative methods for achieving the expected results, that the risks to subjects are minimal, and that sufficient explanation or a debriefing will be given to participants as soon as possible following the conclusion of the research.

But it goes on to say that for research in the cyberspace world, "Without a clearer understanding of the benefits and risks associated with Internet research, it may be difficult to justify deceptive practices online." Issues related to informed consent, written agreement to participate, privacy and confidentiality of responses, anonymity, and methods of debriefing for Internet research introduce new ethical considerations that have yet to be fully developed or understood. Like all matters dealing with the ethics of research, the benefits to the subjects, to society, and to science and knowledge must outweigh any threats to privacy and confidentiality and to the physical or mental harm of the participants and the communities they represent. The debates and issues unique to research online can be explored further at http://aoir.org/reports/ethics2.pdf.

Quantitative research also introduces ethical considerations uniquely relevant for methods that involve statistical analysis. The American Statistical Association's ethical guidelines for statistical practice (www.amstat.org/ASA/Your-Career/Ethical-Guidelines-for-Statistical-Practice.aspx) state that statisticians should do the following:

- Use only statistical methodologies suitable to the data and to obtaining valid results.
- Remain current in dynamically evolving statistical methodology; yesterday's preferred methods may be barely acceptable today and totally obsolete tomorrow.
- Report statistical and substantive assumptions made in the study.

- When reporting analyses of volunteer data or other data not representative of a defined population, include appropriate disclaimers.
- Report the limits of statistical inference of the study and possible sources of error.
- Account for all data considered in a study and explain the sample(s) actually used.
- Write with consideration of the intended audience. (For the general public, convey the scope, relevance, and conclusions of a study without technical distractions. For the professional literature, strive to answer the questions likely to occur to your peers.)

Autonomy, Beneficence, and Justice

The simplest way of summarizing the key principles of ethical research is to invoke a 1979 document created by the U.S. Department of Health, Education, and Welfare known as "The Belmont Report" or "Ethical Principles and Guidelines for the Protection of Human Subjects of Research" (www.hhs.gov/ohrp/regulations-and-policy/belmont-report/). This report states the three guiding principles that govern research with human subjects and that should be raised whenever any research is proposed and conducted are autonomy, beneficence, and justice.

Autonomy is the principle of respect for individuals as autonomous agents and protection of those with diminished autonomy (such as the incapacitated, mentally ill, or prisoners). Participants in research must voluntarily participate on the basis of adequate information to consent to their involvement in the project.

Beneficence requires researchers to do no harm, to maximize the benefits to knowledge and society, and minimize the risks and potential injuries to the participants.

Justice refers to fairness in distribution so that no particular group of people is systematically denied equal entitlement to a benefit or selected for participation in a research project because of their easy availability and manipulability, especially when unrelated to the purposes of the study.

This statement from the American Sociological Association's Code of Ethics says it succinctly and applies to all fields of study. (Just substitute "psychologists" or "anthropologists" or "political scientists" or any other field for "sociologists.")

> Sociologists respect the rights, dignity, and worth of all people. They strive to eliminate bias in their professional activities, and they do not tolerate any forms of discrimination based on age; gender; race; ethnicity; national origin; religion; sexual orientation; disability; health conditions; or marital, domestic, or parental status. They are sensitive to cultural, individual, and role differences in serving, teaching, and studying groups of people with distinctive characteristics. In all of their work-related activities, sociologists acknowledge the rights of others to hold values, attitudes, and opinions that differ from their own.

REVIEW: WHAT DO THESE KEY TERMS MEAN?

Academic article

Autonomy, beneficence, justice

Boolean logic

Code of ethics

Confidential versus anonymous

Database

Debriefing

Deductive and inductive reasoning

Informed consent

Institutional review board

"Opt-in" versus "opt-out"

Plagiarism

Replicate

Search engines

Secondary sources

Serendipity

Theory

Voluntary participation

TEST YOURSELF

1. Respondents are given a code number on a survey and assured that only the researchers will know which code numbers are assigned to specific people and only the researchers will see the responses. Explain whether this is an example of confidentiality or anonymity.
2. Explain the three guiding principles of doing research ethically with human subjects.
3. Now that you have finished this chapter, what does the Einstein quotation at the beginning mean to you?

INTERPRET: WHAT DO THESE REAL EXAMPLES TELL US?

1. Vendemia et al. (2017: 30) were interested in understanding why some young people "friended" people on social networking sites (SNS) that they didn't really like or found annoying and how this could lead to attachment anxiety feelings in relationships with others. The following are some excerpts from their literature review (Note: citations within the quotation are provided in the original article and not in the References of this book):

> The uses and gratifications perspective suggests that individuals use media to fulfill needs and wants (Rubin 2002). SNSs satisfy a variety of needs, including entertainment, information, surveillance, diversion, and social utility (Urista, Dong, & Day, 2009). Keeping in touch with friends is the most commonly reported motive for using SNSs, followed by social surveillance (Joinson 2008).

Previous work examines two dimensions of attachment: anxiety and avoidance; however, it is the anxiety dimension, which assesses the uncertainty individuals feel in close relationships, that may most effectively explain befriending disliked others and monitoring annoying posts on SNSs. Individuals with anxious attachment tend to be uncomfortable with themselves, which causes them to be consumed by relationships with others (Bartholomew and Horowitz 1991).

a. How is theory being used to generate ideas for a study here?
b. Is this deductive or inductive reasoning?
c. How might these theories relate to the topic of their research?
d. What kinds of research questions could you generate from these very brief descriptions of various theories?
e. What are some of the ethical concerns you would raise about such a study?

2. For a study conducted in India about the relationship between intense use of SNS and social psychological well-being, Dhir et al. (2017: 523) describe their methodology:

> The process of self-selected participant recruitment was as follows: First, a pool of junior and senior high schools were randomly taken and were contacted. The selected schools were clearly informed of the research questions and objectives of this research study and related practicalities. Later, a face-to-face meeting was usually organized (if needed) and all the important information concerning research participation was discussed with the interested schools at length. After receiving formal approval, the proposed study was advertised among the target group of users and they were invited to participate in the survey answering sessions . . . . Before the actual study, the lead author briefed the participants on the research questions, objectives, research process and related practicalities. The researchers ensured that all participating students received an equal chance to participate in this research study. Moreover, the participation was kept voluntary and anonymous.

a. Using the code of ethics, how do you evaluate this method of recruiting participants?
b. What other ethical concerns do you feel need to be addressed?

CONSULT: WHAT COULD BE DONE?

Imagine you have been asked to consult on some research projects. Discuss with the researchers the *ethical* issues involved in the following situations:

1. You collect information from Facebook posts about where people travel on vacations and what their ages, gender, and race/ethnicity are.
2. Prisoners in the state penitentiary can get time off if they agree to try a new kind of medication.

3. Students in an intro psychology class get extra credit for volunteering for an experimental study conducted by the professor.
4. An employer announces to workers that a survey about management issues will be conducted and they can opt-out if they so choose.
5. High school students are invited to complete a questionnaire on drug and alcohol use. Monetary incentives will be offered for completion of the surveys.
6. For a study on nutrition and performance, participants are given high-fat-content meals for several days before being asked to solve some mathematical problems.
7. You are led to believe that you are receiving a new vitamin to help in fighting colds, but later realize you were part of the control group receiving a placebo (a nonvitamin sugar pill).
8. You pose as someone of a different race and gender in an Internet discussion group to collect what people have to say about the meaning of friendship in their lives.

DECIDE: WHAT DO YOU DO NEXT?

For your study on how diverse people develop and maintain friendships, especially on social media, respond to the following items:

1. Determine which databases would be most useful for a study of this kind.
2. Develop some key words that you could use in a search of databases to find academic articles on the topic.
3. Identify the pros and cons of using websites like Facebook, Twitter, and Instagram to collect information about friendships.
4. Make a list of categories and themes you would use to organize the research literature after you have reviewed relevant articles and books.
5. If you are doing such a study, list the databases and the key words you used, create a bibliography of at least five articles and books related to your specific topic, and write up a summary of the readings organized thematically.

DESIGNING RESEARCH

Concepts, Hypotheses, and Measurement

It is a capital mistake to theorize before you have all the evidence. It biases the judgment.

—Sherlock Holmes (by way of Sir Arthur Conan Doyle, writer)

LEARNING GOALS

Central to doing survey research is understanding the idea of operationalization and how to go from ideas to concepts to variables. Learning the various levels of measurement is also essential for analyzing data. This chapter shows how to write hypotheses using independent and dependent variables and how to evaluate the reliability and validity of measures. By the end of the chapter, you should be able to distinguish the different levels of measurement (nominal, ordinal, and interval/ratio), discuss the various kinds of reliability and validity, and create one-directional, two-directional, and null hypotheses.

After we select a topic and review the literature, we are ready to begin constructing a research plan. A research design serves as a blueprint for the project and must be detailed when proposing a topic for a thesis or applying for a grant. A *research design* involves several stages: (1) developing concepts that are derived from ideas, theories, or prior research; (2) taking those concepts and translating them into measurable variables (operationalizing concepts); (3) selecting the most appropriate research method to gather data (surveys, experiments, field methods, content analysis, etc.) on the basis of the goals of the project (to describe, explain, predict, explore, or evaluate); (4) choosing a sampling strategy for deciding whom or what we want to study (*the units of analysis*) and over what period of time (longitudinal across time or a one-time cross-sectional study); (5) planning how to collect the data and who will

do it; (6) deciding on the relevant statistical and analytical tools to make sense of the findings and observations; and (7) describing plans for interpreting and analyzing the results and writing a final report, article, or policy recommendation. A detailed budget should also be included as part of a research design (especially for a grant or funding agency) which specifies everything from the costs of duplicating questionnaires to phone calls, supplies, salaries for researchers and those doing the data collection, computer data entry and software, travel expenses, online hosting fees, and other related items. The remaining chapters of the book explore these steps in the research design process as they apply in particular to survey research methods.

VARIABLES AND HYPOTHESES

Creating a research design or systematic plan is essential for carrying out a scientific study. By carefully specifying the steps necessary for researching a topic, we avoid many of the pitfalls of everyday thinking described in Chapter 1. The first important phase in this process is formulating ways to measure ideas and concepts with accuracy and consistency.

Concepts

Research is guided by a set of questions composed of concepts connected to your topic. These concepts may have been uncovered in a review of previous research and theories or developed from your own intellectual curiosity and knowledge. A *concept* is an idea, a general mental formulation summarizing specific occurrences, such as "gender" representing masculinity and femininity, or "age" summarizing specific instances of the idea of time (youth, middle age, elderly). A concept can be defined with a dictionary to produce a common usage of the word, and a search of scientific publications can result in a more suitable definition for the appropriate field of study. Otherwise, the meanings of concepts can be quite subjective and made more difficult to measure, especially for more abstract ones. Some concepts are specific and concrete, such as "height" or "academic major," while others, sometimes called *constructs*, are more complex, abstract, or difficult to define, such as "happiness" or "anomie." Ask many people to define the concept of "love," and you'll get everything from operas to paintings to poetry to puppies.

Conceptualization must occur for research to begin, and what we mean by the ideas and terms used in our study should be explicitly stated. For example, if you are interested in studying gender differences in phobias, you need to be clear about your conceptualizations. Psychologists define the concept of "phobia" as a persistent illogical fear, while sociologists define "gender" as the prescribed roles that men and