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INTRODUCTION AND OVERVIEW

LEARNING OBJECTIVES

After reading this chapter, you will be able to

1. Define the concept of *research*.
2. Define and explain different types of *scientific evidence*.
3. Define and understand *empirical research*.
4. Understand why scientific literacy is important.
5. Describe different types of research paradigms.

If you're interested in learning more about how to read, evaluate, and use research, for graduate school or your professional practice, then you've picked up the right book. Our goal is to help you become a more knowledgeable reader and evaluator of research. In other words, as a professional who will rely on research evidence as part of your development and practice, becoming more informed in this area is important. But it is also important because we live in a society overloaded with information. We all have an obligation to consume this information with a discerning eye to be able to assess what is legitimate, trustworthy, and accurate from what is not. Thus, a dive into the world of reading research methods helps us not just in our professional lives, but also our daily lives and interactions.

Suppose you're having coffee with a friend, and they ask if you've seen the latest news story that cautions readers that drinking too much coffee slows down your metabolism. Would you (a) tell your friend they're full of it and order a second cup of coffee, (b) immediately stop drinking your coffee and order a tea, (c) do neither and vow to look up the evidence later. Although often our instinct is to believe such anecdotal information (especially if it seems to confirm a belief we already have), this book is about encouraging you to develop skills, motivation, and inclination to choose "C".

We are constantly immersed in information proclaiming all kinds of cause-and-effect scenarios. Sometimes they're true (smoking can lead to cancer), and sometimes they're quite misleading or false (vaccines cause autism). In most cases, these misleading or erroneous nuggets are believable. After all, how would you really know? Well,

you're taking an important step by educating yourself and by reading this book, you can come away with some skills and knowledge that will help you to become a savvy consumer of information in general and of research evidence specifically.

Although the knowledge presented here can help with day-to-day information, the other and more important benefit will be to help you become a more knowledgeable and critical thinker of information in your chosen profession. After all, one of the reasons scholars engage in research is to study problems in search of solutions that can help practitioners and policymakers make sound decisions. Thus, problems like reducing internet bullying, improving third grade mathematics instruction, or decreasing recidivism in chemical dependency treatment centers are all potential problems that could be investigated using the methods we discuss in this book. Because researchers who conduct research and publish their findings generally write for other researchers, as a consumer of that research you will need to develop your **scientific literacy**—*the motivation and skills for seeking out, understanding, and evaluating scientific evidence*.

According to the National Academy of Sciences, “scientific literacy is the knowledge and understanding of scientific concepts and processes required for personal decision making, participation in civic and cultural affairs and economic productivity” (National Research Council [NRC], 1996, p. 22). Pertinent to the goals of this book is the idea that a scientifically literate person can

- Read articles with understanding of science in the popular press and engage in social conversation about the validity of conclusions
- Identify scientific issues underlying national and local decisions and express positions that are scientifically and technologically informed
- Evaluate the quality of scientific information on the basis of its source and the methods used to generate it
- Pose and evaluate arguments based on evidence and to apply conclusions from such arguments appropriately. (p. 22)

The first two bullet points have to do with being able to converse about topics in a meaningful and critical way. The second two bullet points have to do with using science to become a more informed professional. We hope that in learning from this book, you adopt both the skills and knowledge about how to read and evaluate research (Bullets 3 and 4), but also the motivation and inclination to want to use research for being able to “engage in social conversation” about a variety of topics (Bullets 1 and 2).

In this chapter, we start things off with an introduction of basic terms and ideas associated with the knowledge required to understand the scientific evidence and help you to begin to think about what constitutes scientific inquiry. We then describe different types of publications that fall within the realm of scientific inquiry. Next, we describe the nature and utility of data-driven research underscoring the range of goals

and purposes of different types of research strategies and methods. We end with a brief introduction to the main types of methods covered in this book.

ORGANIZING TERMS AND CONCEPTS

It is important to clarify some basic terms used in this book. We start with a discussion of the term *research* that can be carried out as an action (to do research) or be understood as a thing or outcome (to read research). Let's start by thinking about research as an action. When someone asks you to research something, what does that mean to you? Does it mean turning to social media or news outlets for information about a topic? Does it mean going to the library to track down information on the topic? Does it mean collecting data and performing some kind of analysis on that data? Importantly, all three of these examples reflect the act of "doing research."

At the most basic level, we all do "research" whenever we scour the internet or media for information on a topic. For example, when you're at that coffee shop and someone wants to know the effects of caffeine on metabolism, anyone can research this by turning to the internet or popular social media sources and reading whatever comes up. But, how do you know what to believe? How do you know whether the information is grounded in evidence and trustworthy, or whether it is biased or just plain wrong? If the answer is "It doesn't matter" (i.e., the stakes of being wrong are inconsequential), then the internet or your favorite social media outlet may be adequate in that moment. However, if the accuracy and usefulness of the information you glean has consequences (for people, your professional practice, for school, or personal health), then you might need to "do research" a little differently. If you want information that is more credible and meaningful, then you must employ your scientific literacy skills to seek out, evaluate, and utilize the **scientific evidence**—*the collection of scholarly work that reflects a systemic investigation of the question/topic at hand and has typically gone through a peer-review process*. Rather than relying on anecdotes, or stories you might read in the news and social media, this type of research involves going deeper into the scientific evidence in order to get more credible information on any given topic.

For example, one might hear on the news that the rate of bullying in schools has risen over time. Someone interested in the accuracy of that claim, or the underlying reasons for the reported trend, would consult sources that report on the theorizing and study of bullying—they would consult the scientific evidence. In contrast to the casual observer who might be compelled to look up bullying on the internet and follow the breadcrumbs of information that are rarely vetted and often represent anecdotal or fictional accounts, a more serious observer (you!) would consult the "scientific evidence" on bullying to evaluate for themselves whether this news statement accurately reflects scholars' current understanding of the nature of bullying. You would read first-hand accounts of studies conducted on the topic as well as essays theorizing on the causes and outcomes of the topic. The goal of this book is to help you to become one of those

more serious observers so that you not only understand but also so that you evaluate the adequacy of the information you read. In short, by learning what we present in this book, you will be able to evaluate the nature of a problem and possible solutions through analysis and critical examination of the scientific evidence.

Another type of research we “do” is in the form of a study where data are collected and analyzed in the service of answering specific questions related to social problems. Most professionals, especially those in the service sector (e.g., counselors, nurses, social workers, teachers), generally don’t engage in this type of research. Practitioners rarely conduct a research study as part of their professional lives. Typically, this is reserved for those who pursue doctoral-level degrees or who go into a research-oriented profession. Instead, for practitioners what is critical is that we are able to read, understand, and evaluate whether the research we read is carried out in a meaningful way and therefore able to provide us with meaningful and useful answers.

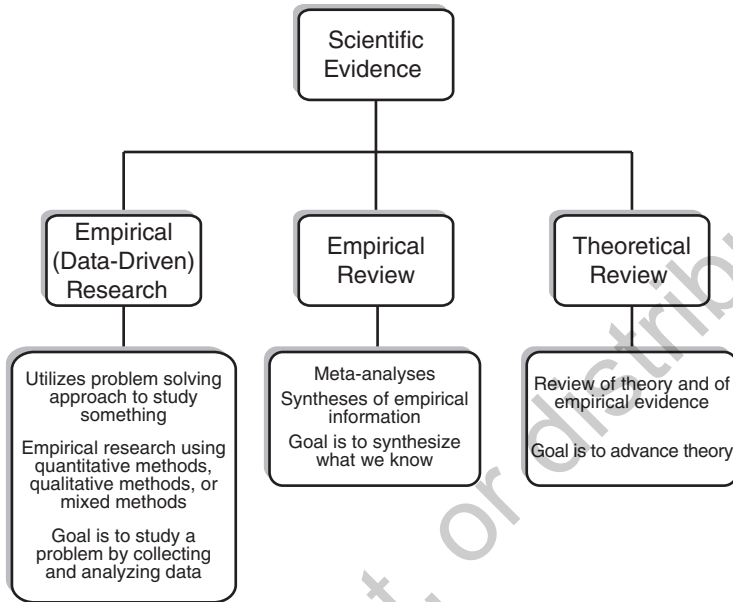
Another important point to make is just because a study is published, it does not guarantee that it is useful or that the steps the researcher carried out are well done or that the answers are justified. Therefore, as readers, we need to be able to read the scientific evidence and not just understand it, but also have a way to evaluate it. A nurse may need to understand what research has been conducted to study the impact of insulin on weight gain, or a social worker, the impact of poverty on child development milestones. Although we are not trained to conduct studies, we need to be prepared to read them, understand them, and make sense of them as a collective. We need to be able to understand the scientific evidence available on topics related to our profession.

The scientific evidence on a given topic or problem area generally consists of three types of writing that are published in various formats (e.g., journals, books): (a) empirical (data-driven) research, (b) empirical review articles (empirical syntheses or meta-analyses), and (c) theoretical review articles. This book is primarily about understanding how to read, and understand empirical research; however, it is important to know there are other types of scientific evidence available. We briefly describe each next.

Empirical (Data-Driven) Research

The term *empirical* is defined as *originating in or based on observation or experience*.¹ When researchers carry out a research study, they engage in a process of asking questions and collecting empirical evidence used to help answer their question(s). That is, they collect real-world observations or experiences that are used to address the question at hand. Empirical evidence therefore, is another way of talking about **data**, or *real-world observations or experiences*, that are collected in the service of answering a question or series of questions and for our purposes, primarily come in the form of

¹ <https://www.merriam-webster.com/dictionary/empirical>

FIGURE 1.1 ■ Types of Scientific Evidence

numbers (quantitative), words (qualitative) or a combination of both (mixed).² A more detailed discussion of different types of data is presented in Chapters 4, 5, and 6. For now, understand that data³ is a general term to refer to information that is collected from individuals, documents, and contexts that are in the form of words (qualitative information), numbers (quantitative information) or both (some combination of quantitative and qualitative information; Figure 1.1).

There are different types of empirical (data-driven) studies. In the quantitative tradition, there are generally two categories of research. One is descriptive research—research that has a goal of describing trends or patterns in the data. The second is inferential research—where researchers have the goal of generalizing beyond the data they collected (see Chapter 4 for details). In the inferential category, researchers may pursue one of three types of research questions. One type has to do with questions about relationships (also referred to as correlations). For example, a researcher might

² There are other types of data specific to specialized fields that are not words or numbers and can include visual and sound as data. For example, “Using visual data in qualitative research,” in Uwe Flick (Ed.), *The Sage Qualitative Research Kit* (2nd ed.), 2018, SAGE; *Qualitative Researching With Text, Image and Sound: A Practical Handbook*, by Martin W. Bauer and George Gaskell (Eds.), 2000, SAGE.

³ Importantly, there exist inconsistencies throughout the literature regarding whether to use data as singular or as plural noun. Based on its Latin roots, data is plural and should be used to indicate “data are” and not “data is.” However, not everyone agrees to this convention. In this book, we treat the word data by its Latin origins as a plural noun. For more information, see: <https://grammarist.com/usage/data/> or <https://www.quickanddirtytips.com/education/grammar/is-data-singular-or-plural?page=1>

ask questions such as, do stronger people have more muscle mass? Do students with higher motivation have higher GPAs? Is there a relationship between number of times we wake up at night and the amount of coffee we drink during the day? Another type of question is also about relationships but is framed as questions about predictions (otherwise known as regression). A researcher pursuing a regression-like questions would ask things like, does GPA predict college success? Does a Keto diet predict weight loss? Does an increase in the number of books in the home predict higher reading success in school? A third type of question is about making comparisons, or whether groups are different from one another. Researchers in this category ask questions such as, Does a hospital patient who receives Drug X recover quicker from surgery than those who receive Drug Y? Do people with healthy diets weigh less than people with unhealthy diets? Is there a difference in student reading comprehension test results depending on teaching method “A” versus teaching method “B”? We elaborate on these approaches and the relevant statistical strategies that accompany them in Chapter 4. For now, it is useful to understand that in general, researchers who pursue questions that are basically yes/no in orientation are engaging in a type of research strategy that typically employs quantitative methods (e.g., testing theory or hypothesis).

A second type of data-driven research is rooted in the qualitative tradition and is more often guided by the goals of discovering new ideas, questions, or implications not thought of yet. In contrast to quantitative approaches, researchers guided by these goals engage in tactics of exploring, describing, or categorizing phenomena or experiences (e.g., generating theory). They employ questions that tend to be more open ended by nature. For example, researchers might want to know *how* teachers talk about their emotions while teaching, *how* nurses manage the stressors of their work, or *how* counselors describe the challenges of treating clients diagnosed with borderline personality. In this approach, researchers make different sets of choices about the collection, management, and analysis of their data (see Chapter 5).

A third type of data-driven research is rooted in the mixed methods tradition. In this type of data-driven research, researchers adopt mixed methods to understand problems from multiple perspectives and therefore use multiple tools and analytic strategies in a single study (i.e., Mixed Methods, see Chapter 6). Researchers adopting this approach to inquiry typically do so because they want to approach problems from more than one perspective. In other words, they want to ask specific questions as well as engage in exploratory processes and typically relying on different types of data (qualitative and quantitative). Sometimes different forms of data are collected simultaneously, sometimes sequentially, or analyzed sequentially or concurrently. The approach is dictated by the research questions and ultimate goals of the project.

Across all types of data-driven research, the common denominator is the presence of data that again come in the form of words (qualitative data), numbers (quantitative data) or a combination of both (mixed) and the implementation of a particular set of strategies designed to use that data to answer some research question. In this book, we

discuss some of the more common types of data-driven research methods, designs, purposes, and strategies to help you develop the skills, knowledge and hopefully inclination to read and evaluate research in the service of your profession.

Meta-Analysis

Another category of scientific evidence you will encounter is referred to as **meta-analysis** or *an empirical approach used to integrate and describe the results of a large number of studies*. Introduced by Glass (1976), meta-analysis was developed as a way to measure the effects of treatments or interventions by synthesizing what we learn from a collection of individual studies examining that treatment or intervention. As you'll learn throughout this book, any single study can only provide a small glimpse of what we might know about any given topic. Typically, although we may learn in a single study that a certain treatment or intervention has an effect, results from this one study do not tell us with certainty whether the treatment works under all conditions or with all types of persons. Thus, questions remain that limit our ability to come away with strong conclusions about the presence or absence of an effect. That is, if an effect is found, how do we know it will work across different types of populations? How do we know if it works if there are slight modifications? How do we know how it compares with other types of treatments? A single study, even one that is well designed and executed (see Chapters 4, 5, and 6), can only tell us so much about the connections between treatments and outcomes. The meta-analysis approach was developed as a way to combine what we learn from a series of individual studies in a way that yields a statistic (a number or metric) that tells us with more certainty the relative effectiveness of particular treatments. As can be surmised, the greater the number of studies included in the analysis and/or the greater the resultant effect allows us to have relatively higher confidence in our findings—confidence that surpasses the confidence we may have from any single study.

For example, in one of the first uses of meta-analysis techniques, Smith and Glass (1977) wanted to know the overall effectiveness of psychotherapy for treating mental health conditions. Individual studies at the time each came with certain strengths and weaknesses all of which made it difficult to understand fully the overall effectiveness of talk therapy for treating clients. Some studies seemed to detect positive and relatively large effects, whereas others found smaller effects. Similarly, different talk therapy approaches yielded diverse effects with different samples. This landscape of evidence made it difficult to conclude what treatments were effective, with whom or by how much. The conclusions gleaned from a single study or even a selection of studies can only tell us a narrow or particular view of the whole story. However, using meta-analytic techniques and combining data from across nearly 400 different studies, Smith and Glass (1977) found overwhelming evidence that the “typical therapy client is better off than 75% of untreated individuals” (p. 752). They also found that there

was almost no difference in effectiveness between types of therapies (behavioral, psychodynamic, etc.). Collectively, their conclusions could not have been reached on the basis of any single study alone. Meta-analysis helps us understand on a larger scale the relative impact of treatments or interventions on outcomes.

Literature Reviews

A **literature review** is a synthesis of relevant studies related to the research topic at hand. It summarizes what other scholars have found in the area, but also presents a key argument for what has yet to be studied. (see Chapter 3). There are two types of literature reviews you may encounter. One type is the literature review presented at the beginning of a data-driven study. The goal of this type of literature review is specific to the study being reported on and therefore it will contain specific characteristics that you should look for (e.g., Booth et al., 2016; also see Chapters 2 and 3). A second type of literature review refers to stand-alone publications where a scholar organizes and synthesizes the available information on a given topic. This type of publication comes in different forms, assumes different goals, and can be found in different publishing outlets including journals, books, handbooks, and online databases to name a few. Some of the most common goals of these types of reviews are to (1) synthesize the most up-to-date information available at the time of publication (from what has been published in books, handbook, journals, online sources), (2) use recent (or historical) information to make a case or take a stand (reviews in which authors take a stand for or against a particular trend/theory/policy), (3) revisit old arguments with the goal of refining, transforming, or pushing theoretical understandings forward, and (4) present guidelines for practice that are based on the most up to date and rigorous research available (Cooper, 1988; Gough & Thomas, 2016; Gough et al., 2012).

For practitioners, literature reviews are vital sources of information because they can provide “a trustworthy answer to a specific review question” (Booth et al., 2016, p. 11). For example, say you want to know whether a certain type of behavior intervention is effective for reducing misbehavior among third graders. A literature review publication (that could be found in books, journals, or online resources) could offer an authoritative review of the relevant data-driven research available and report on what all the findings may represent. In fact, as Booth et al. (2016) point out, literature reviews can provide “knowledge support” or “decision support.” Reviews aimed at knowledge support summarize and synthesize what the research evidence says about any given topic. By contrast, decision support reviews focus more specifically on particular decision-making issues (i.e., evidence on the efficacy of treatments, interventions). For consumers, these types of publications can be quite valuable for underscoring the range of issues, problems, and treatments associated with any given topic. In Chapter 2, we provide some strategies for how to search out and identify this information.

WHY SCIENTIFIC LITERACY IS IMPORTANT

As a future professional, it is important that you are up to date on the best available evidence in your field. We would suggest that anyone pursuing a professional degree and occupation should understand the role, value, and quality of research in their area. For practitioner-oriented professions this is incredibly important. Practitioners (e.g., teachers, nurses, social workers, counselors, school psychologists) are in the business of working with others and have to make ongoing decisions related to best practices for the people they serve. Importantly, as decision-making professions, it is critical these service providers stay abreast of the most up-to-date evidence in their field.

Practitioners across disciplines are encouraged to engage in evidence-based practice (Spencer et al., 2012). In psychology, the American Psychological Association (2005) defines evidence-based practice as “the integration of the best available research with clinical expertise in the context of patient characteristics, culture, and preferences.” In education, it is defined as “the integration of professional wisdom with the best available empirical evidence in making decisions about how to deliver instruction” (Whitehurst, 2002). In the medical profession, evidence-based practice is based on three sources of influence: “(1) the best available evidence, (2) clinical expertise, and (3) client values” (Institute of Medicine, 2001). Synthesizing across these and other definitions, we underscore Spencer et al.’s (2012) definition that **evidence-based practice** is a “decision-making process that integrates (1) the best available evidence, (2) professional judgment, and (3) client values and context” (p. 129).

The term *practice* in evidence-based practice (EBP) refers to two types of professional decision-making—one specific and one more general. Across most areas (e.g., medicine, education, counseling) evidence-based practice refers to practices associated with a specific technique, method, or intervention. For example, in education EBP tends to refer to a specific program or intervention that has been found to have the support of research evidence, such as interventions that increase motivation, or reading skills. In counseling, it could refer to a specific therapy or therapeutic approach with a strong research base, as such as specific therapies to treat posttraumatic stress disorder (PTSD). Or, in medicine EBP could be a case in which a specific treatment has research support for treating a particular ailment, as in the case of the research on the effectiveness of vaccines. Evidence-based practice referring to these types of practices are associated with specific forms of empirical evidence, for example, studies that employ experimental design.

Importantly, references to evidence-based practice also refer to a more general idea of professional practices and includes all the decisions relevant to any given profession. A teacher for example, makes all kinds of decisions throughout a given day, not just what specific technique or approach to use for a given lesson. Every decision from how to manage classroom activities, what feedback to give, how to assess learning, how to engage students are part of an educators’ daily practice. Thus, evidence-based practices have to do with not just a given treatment or technique for a given person in a specific

situation, but the compilation of a host of decisions professionals must make. In your future profession, you'll likely engage in both forms of evidence-based practice and therefore will need to be able to read, understand, and evaluate the many forms of empirical research in your discipline to inform your decision-making.

NATURE OF DATA-DRIVEN RESEARCH: INTRODUCTION TO RESEARCH METHODS

The whole point of data-driven research is to investigate questions or problems researchers identify as important. The way in which researchers go about understanding any problem begins and ends with what the researchers deem to be the overarching goals of the project. Is the goal to find out whether a certain reading intervention is effective? Is it to understand how teachers create emotions while teaching? Is it to gauge how clients respond to various therapeutic techniques? All decisions about how a researcher might go about understanding a problem start with defining the goals of the study. Once the goals are identified, researchers go about deciding what techniques they will employ to study the problem at hand. Most of the time, these techniques, or approaches flow from some of the general assumptions that researchers make about the nature of the problems they are studying. We organize this discussion by describing some of the more common research paradigms that organize these assumptions and which guide methods of social science research.

Research paradigms, defined by Kuhn (1996, p. 45) as “the set of common beliefs and agreements shared between scientists about how problems should be understood and addressed,” serve as a helpful guiding framework for the **research methods**, or *the procedures or steps researchers use to carry out a study*. Here, we describe five common paradigms: positivism/postpositivism, constructivism/interpretivism, pragmatism, critical theory, and transformative-participatory. We describe how each paradigm approaches the task of science by exploring their ontological, epistemological, and methodological differences. These philosophical distinctions are key to understanding how paradigms relate to research methods.

Ontology refers to the question of “What is reality?” Research paradigms vary in terms of the researcher’s assumptions regarding the nature of reality. **Epistemology** refers to the question of “How do we know reality?” Here, paradigms vary by way of assumptions researchers make regarding the nature of knowing. Lastly, **methodology** refers to *the general strategies for how we approach research*. Methodology differs from the term *methods* in that methodology has to do with general strategy or rationale that outlines how the research should be undertaken (e.g., Quantitative? Qualitative?), whereas research methods refer to the specific steps undertaken to collect and analyze data (sampling decisions, whether to use surveys or interviews, how to analyze the data, etc.).

Research informed by a **positivistic paradigm** proceeds according to the ontological and epistemological assumptions that *reality is* “concrete, separate from the

researcher, and understandable through the accurate use of ‘objective’ methods of data collection” (Prasad, 2018, p. 2). Whether or not that truth is obvious, visible, or able to be understood with research methods available to us is irrelevant since this research paradigm is simply about the assumption that the nature of reality is objectively available for discovery. Researchers guided by this world view tend to employ quantitative methodologies that allow for “reality”-testing protocols. The logic that follows from this world view tends to be the following: There is a certain reality in the world that exists; I have some hypothesis about what that reality is; I engage in a set of well-defined, well-controlled steps that I create, manage, and employ to test for that reality; and my conclusions either affirm or not affirm what I think is reality. Another important feature of this world view is the importance of perceived objectivity. Researchers guided by this world view believe not only in a particular version of truth (ontology), but that it can only be discovered through methods that render the researcher a wholly “unbiased” observer of that truth (epistemology) (Ayer, 1959).

Researchers guided by a positivistic paradigm tend to employ quantitative methodologies that include the use of the scientific method to study and analyze questions. Here, the **scientific method** refers to *a series of proscribed steps designed and implemented to detect the presence of some hypothesized reality in the world*. For example, I may believe that a diet without carbohydrates will cause weight loss. I design a study that employs a set of steps to help me find out if I am correct. The whole point of research from this approach is to design a set of steps that will help me with a relatively high degree of certainty detect whether I am right in my assertion of what is reality (or my hypothesis). As another example, I might believe that spanking causes children to become aggressive. Again, this is my hypothesis or statement of reality I believe in. I would employ methodologies and methods consistent with the ontological and epistemological view that reality exists and that it is knowable through objective data collection and analysis methods.

A **postpositivistic paradigm** is viewed as an amendment to the more stricter positivist philosophical paradigm and is a position in which reality and objectivity are the goal but practically understood to be illogical and difficult to achieve. This is true when it comes to social sciences and efforts to understand the complexity of human behavior. As many have argued, achieving such objectivity as dictated by the positivistic paradigm is largely impossible when studying social science questions that involve culture, relationships, and the complex nature of humans. Thus, postpositivism was adopted as a more “liberal” brand of positivism that allows for research in which ontological and epistemological assumptions are less “pure” (Panhwar et al., 2017) That is, research grounded in postpositivist paradigm seeks to *understand the nature of an “objective reality” without the expectation that answers are absolute* (Lincoln & Guba, 2000).

Constructivist/Interpretivist is another research paradigm with a very different view of ontology and epistemology. In this approach, a researcher’s assumption is that *reality (i.e., ontology) is not absolute, but relative, localized, and context bound*. In other words, they believe truth is relative and dependent on persons, places, or events. This

philosophy and its inherent assumptions about the nature of the world requires a different approach to the inquiry of problems. Instead of reliance of some extant truth the researcher may have identified, researchers guided by this paradigm are in the business of trying to *discover* the personal or relative truth of particular people, places, or events. For example, researchers might want to understand the kinds of conditions that help or hinder a carbohydrate-free diet. Or they may want to understand what kinds of activities, relationships, and social interactions unfold in households with different beliefs about spanking. The key to this approach is the researcher is positioned to let the participants/context explain their version of reality.

Pragmatism is an approach to research that is guided by the quest to understand and study problems. Rather than being guided by any single philosophy on the nature of truth, pragmatic scholars identify real world problems and then utilize appropriate methods to help them study the problem. For example, if the problem has to do with whether it is common that high achievers are called on more often than low achievers in English classes, then quantitative methodologies might be more appropriate because the goal is to attempt to generalize to larger populations. But if the goal is to understand how Indigenous students in fifth grade experience English class, then qualitative methods might be more appropriate since the goal is to better understand how local contexts and culture informs the experiences of students. The whole approach of pragmatic scholarship is to first identify a problem or question and then utilize the appropriate methods that match those goals.

Critical theory approaches are characterized as “a set of intellectual positions that examine social arrangements through the lenses of power, domination, and conflict” (Prasad, 2018, p. 125). Like constructivist/interpretivist paradigms in which the assumptions are that reality is socially constructed, critical theory scholars believe that reality is based on how it is interpreted by actors while also accounting for the role of “power relations and conflicting interests in any given society” (p. 125). Researchers guided by a critical theory focus are relatively consistent in focusing on “oppression and exploitation of different groups whether they are women, workers, the poor, or specific ethnic minorities” (p. 126). Some common lenses used in social sciences include critical race theory, Latinx critical race theory, critical gender theory, and feminist theory. Researchers who adopt this paradigm approach social science problems by critiquing social power structures that work to marginalize minoritized populations. In education, for example, critical race theory has been used widely to challenge assumptions regarding educational opportunities for racial minoritized students in schools and the deficit-oriented rhetoric often used to blame minoritized students for lower educational outcomes. Critical race theory researchers works to uncover and critique the systemic and institutionalized racist power structures that contribute to varying outcomes for minoritized students (e.g., Ladson-Billings & Tate, 1995)

Transformative-Participatory approach to research has some similarities with both interpretivist and pragmatic researchers in that they see the local context as important, and they are interested in working to solve problems within that local

context. Sometimes referred to as action research (e.g., Putnam & Rock, 2016), this approach to the study of problems implies that the researcher and potential “subjects” work together to design and carry out the work. For example, a researcher interested in understanding how to increase learning in a math class may partner with Mathematics teachers to co-construct teaching strategies to teach lessons in mathematics and collaboratively identify the appropriate research question(s) to guide the project’s evaluation of those teaching strategies. They would then test those methods, collect data about their effectiveness then, in collaboration between the teachers and the researchers, adjust the teaching strategies in preparation for the next round of implementation. Thus, transformative-participatory research tends to be designed as *an iterative process of collaboration among the researchers and the participants within a particular context (e.g., school, hospital, counseling center) designed with the goal of solving problems within that context.*

A Last Thought on Paradigms

Research paradigms offer a set of assumptions and frameworks to help readers of research to think about the goals of the work they read to understand appropriate methods attached to those goals. However, for many researchers, the overarching goals of their work may be better characterized by their chosen methodology (quantitative, qualitative, or mixed methods) rather than a specific paradigm. That is, there are those who approach research with no intentional regard for the paradigm that may be organizing their work. Instead for many of those scholars, their scholarly identity is defined by the methodology to which they subscribe regardless of their views of reality or the ways it may be measured or represented. For example, qualitative researchers sometimes reject the relevance of paradigms we described here and instead engage in qualitative research rooted in relevant questions around lived experiences. For them, the question of objective/subjective reality isn’t as relevant or important because their approach is rooted in the overarching goals of the project.

Further, it is the case that paradigms and methodologies don’t always flow in what might be considered predictable ways. For example, quantitative methodologies tend to be but are not always in line with a positivistic paradigm. That is, if I believe there is an objective reality that can or should be tested, the assumption is I would employ quantitative methodologies which are used in this regard. However, it is also possible that the alignment is not so straightforward (i.e., that researchers sometimes hold different views and assumptions regarding when and how different paradigms ought to be used). For example, there are some who might argue for something referred to as *qualitative positivism*:

In brief, qualitative positivism employs nonquantitative methods of data collection such as interviews and observation within conventional positivist assumptions about the nature of social reality and the production of knowledge. For the most part, qualitative positivism adopts a relatively commonsensical and

realist approach to ontological and epistemological issues. Reality is assumed to be concrete, separate from the researcher, and understandable through the accurate use of “objective” methods of data collection. (Prasad, 2018, p. 2)

Understanding all the possible relationships between paradigms and research methodologies or the range of scholarly identities assumed by social science researchers is beyond the scope of this book. Instead, what we want you to take away is a basic organizing framework that can help you understand why certain methods might be chosen and subsequently, the type of conclusions that may follow. At a very basic level, understanding that positivistic paradigms see reality in a certain way should predispose you to understand the role of the researcher in collecting data and therefore, will help you evaluate how confident you can be in the answers the research provide. What is key to how any empirical research study is carried out is to understand the overarching goals of the project and to be able to evaluate whether the methods chosen to enact that study match those goals. You should ask yourself what is the problem this study is addressing? What is the approach they took to address that problem (quantitative or qualitative methodologies)? And do the findings match the stated goals and methods employed?

CONCLUSION

The goal of this book is to help readers understand how to interpret single studies as well as how to think about how different types of studies might inform any given topic. A single study on any given topic of inquiry can't tell us much that we can take away and use. Each individual study gives us one small piece of the puzzle. Our job as research consumers is (a) to understand what each individual study does and does not offer what we know about any given topic and (b) to know how to read different types of studies and understand how they all go together to tell the story of any given topic. For example, there is a great deal of research that has examined how high-stakes testing—the process of using standardized test scores to hold teachers and students accountable—influences student achievement. Quantitative-oriented studies have largely found that high-stakes testing is associated with decreases in student achievement in certain subjects and grade levels (e.g., Nichols et al., 2006, 2012). Although important, this type of research only tells part of the story of high stakes testing. Looking at high-stakes testing, and student achievement tells us nothing about how teachers teach when it comes to high-stakes testing. It tells us nothing about what students experience or their level of motivation or if students are similar or different in any way when it comes to high-stakes testing. To make use of research, it is important that we read research on the topic from different points of views, and which take different research approaches to the topic to come away with a broader understanding of that topic. The goal of this book is to give you the tools to be able to read research and be

able to come away not only with skills and knowledge on how to read each individual study, but the skills and knowledge to understand what questions to ask to fill any gaps left behind by an individual study.

CHECK YOUR UNDERSTANDING

1. Define ways we might “do” research.
2. What are three main sources or types of scientific evidence?
3. What does *empirical* mean?
4. What is evidenced-based practice? How is it important for your future profession?
5. Compare and contrast positivism and interpretivism.
6. Provide examples of quantitative and qualitative data.

GUIDED APPLICATION

For this guided application exercise find three different types of scientific articles related to your future profession. Try to find one that is a meta-analysis, one that is an empirical (data-driven) study, and one that is a literature review.

1. What are the main goals of each of these publications?
2. What is an example of empirical research in each publication? How do you know? (Justify your selections).
3. How well do the methods outlined in the article match the goals of the article? Discuss and explain.

KEY TERMS

constructivist/interpretivist
 critical theory
 data
 empirical
 epistemology
 evidence-based practice
 literature review
 meta-analysis
 methodology
 ontology

positivistic paradigm
 postpositivistic paradigm
 pragmatism
 research methods
 research paradigms
 scientific evidence
 scientific literacy
 scientific method
 transformative-participatory

SUGGESTED READINGS

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