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Understanding and Doing Research in Education & the Social Sciences

UNDERSTANDING AND DOING RESEARCH IN EDUCATION & THE SOCIAL SCIENCES

Phillip Olt; Yaprak Dalat Ward; Elliot Isom; Kevin Splichal; and Reade Dowda

Hays, Kansas

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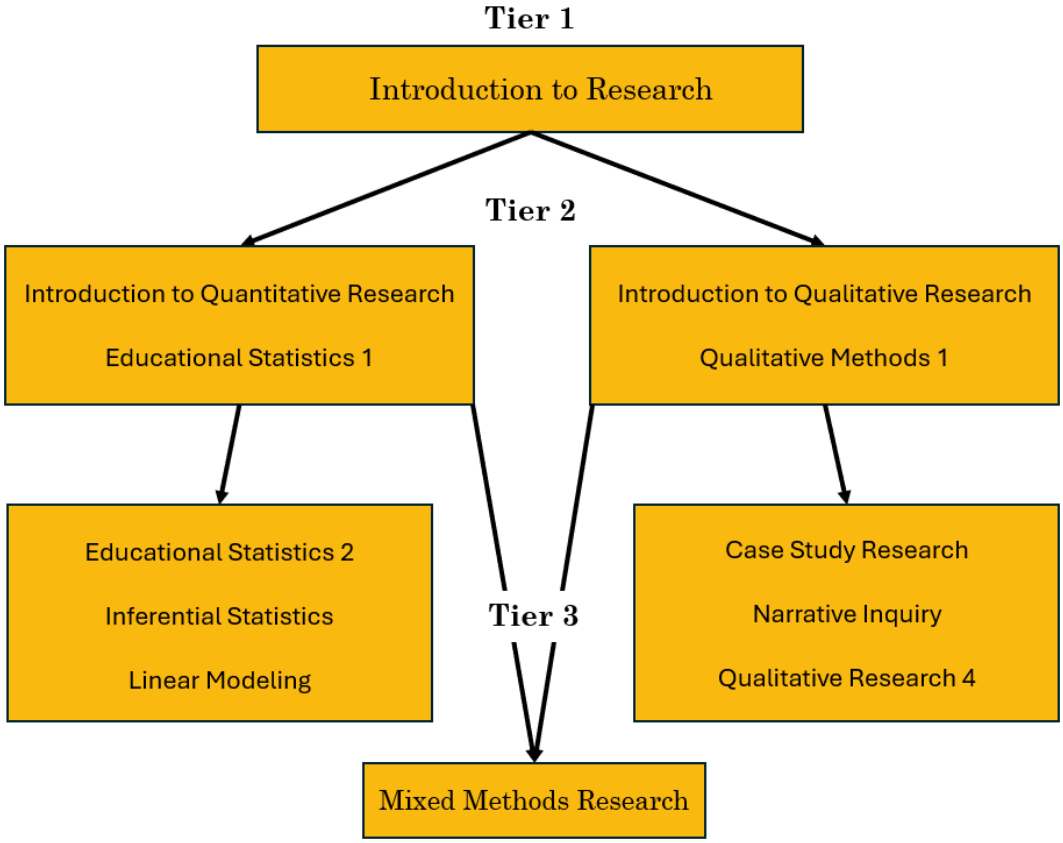
INTRODUCTION

Phillip Olt

The purpose of this book is the provide an open-access, free textbook for initial learning about research for students in the social sciences and related professional fields (such as education, social work, business, or nursing).

Where does that fit into curricula? Below are examples of course titles that may be used reflecting the progression of research training, with the lines between courses being prerequisite courses to proceed with the next level. Typically, the course texts used at each tier will get increasingly more specific with the associated course content.



Tier 1: Introduction to Research Tier 2: Quantitative Research, Educational Statistics 1; Introduction to Qualitative Research; Qualitative Methods 1 Tier 3: (Quantitative) Educational Statistics 2, Inferential Statistics; Linear Modeling; (Qualitative) Case Study Research, Narrative Inquiry, Qualitative Research 4; (Both) Mixed Methods Research

In fields where the entry-level professional credential is most commonly the bachelor's degree (such as education or social work), Tier 1 tends to fall at the master's level with Tiers 2&3 at the doctoral level. Of course, that does not preclude the inclusion of some research content in such areas sprinkled into undergraduate curricula, but that tends not to be a dedicated immersion into research for the sake of understanding research itself. In fields with non-defined professional entry credentials or where professional credentialing normally first occurs at the master's level, Tier 1 is more often at the upper-division undergraduate level, with Tier 2 at the master's level and Tier 3 at the doctoral level. However, there are variations within those. This textbook is intended for a Tier 1 course where the focus is on research literacy and a first attempt at thinking about conducting one's own research. It is not intended as a final authority for the content in such courses; rather, it is a springboard for teaching and a foundation for common understandings.

A friend who is a black belt in the martial arts discipline of Taekwondo once explained the belt system to me in this way. The initial belts tend to be filled with those who do not really know what they are doing and thus lack confidence. The middle belts are those who think they know what they are doing and have too much confidence in themselves. They tend to lack control and be the most dangerous. Those at the highest belts have mastered knowledge, confidence, and control. While perhaps not a perfect illustration, I think there is some parallelism with Tiers 1, 2, & 3 of research training outlined above.

This book is not meant to be comprehensive. It is likely that there will be points in this book where advanced researchers find themselves screaming for more about something that could have been included or where something has been oversimplified. That is a limitation of Tier 1 research education; it is the first step into a pool that seems infinitely wide and deep. Instructors may, of course, add supplemental content or clarification for their students; however, students who want to know more should pursue further studies in Tiers 2&3 and explore the "Additional Resources" provided at the end of each chapter.

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FOUNDATIONS

Phillip Olt

Definitions of Key Terms

- Action Research: An iterative approach to applied research, which can use a variety of social science research methods for the purpose of addressing a local problem of practice or continuous improvement.
- Applied Research: The systematic collection and analysis of data to generate new knowledge for a specific applied purpose.
- Axiology: Properly, "the study of worth;" in practice, it is the study of human values and value systems.
- Basic Research: The systematic collection and analysis of data to generate new knowledge for the sake of generating new knowledge, regardless of the current or future utility of that new knowledge.
- Data: A plural term for facts or evidence collected; data may be numerical and/or non-numerical.
- Epistemology: Properly, "the study of knowledge;" in practice, it is the study of knowledge/truth and how we know it, complete with a set of philosophical positions.
- Experiment (true): A quantitative research design to test hypotheses, wherein (1) participants are assigned randomly but representatively to an experimental group and a control group, (2) all variables are tightly controlled, and (3) some treatment/intervention/experimental condition is implemented to compare data before/after.
- Method: A way of doing something; for example, a survey is way of collecting quantitative data, and an interview is a way of collecting qualitative data.
- Methodology: Properly, "the study of methods;" in practice, a methodology is an over-arching approach to research that has coherent purpose, data collection methods, data analysis, and outcomes.
- Ontology: Properly, "the study of being;" in practice, it is the study of what is/is not real and

what the nature of existence is, complete with a set of philosophical positions.
- Quantitative: An approach to social science research that focuses on the collection of numerical data and/or numerical analysis of data to consider relationships among variables. Often, quantitative research has the goal of producing generalizable results by performing statistical analysis of a small representative sample of the population and implying those results upon the full population.
- Qualitative: An approach to social research that focuses on the collection and analysis of non-numerical data about a phenomenon to explore its qualities. Often, qualitative research is used in either an exploratory (*giving preliminary insight to an un-/under-studied phenomenon*) or explanatory (*giving deeper insight to a previously-studied phenomenon*) way.
- Quasi Experiment: Like a true experiment but without full control of the variables, which can limit the power of its findings (*especially in the attempt to show cause-and-effect relationships*).
- Research: A systematic approach to generating new knowledge situated within the body of knowledge for an area of study.
- Social Science Research: A systematic approach to the scientific study of people, from individuals and relationships to society, to generate new knowledge which is situated within the existing body of knowledge; it is contrasted the approaches to studying humanity rooted in the natural sciences, philosophy, or humanities.

Note: This is an introductory chapter, not intended to address topics in their full complexity. If you find that you wish you had more information about a topic or feel something was oversimplified, please continue reading this book.

Why is research important?

Have you ever taken medicine? or used electricity, attended school, toured a museum, read the news, or traveled on a road? By virtue of the fact that you are reading this, we can assume that at least one of those is true, so congratulations—you're the beneficiary of research! Research is the reason we live in the world we live in today. Each generation conducts research—whether formally or informally—and advances the human race. Moving from bronze tools/weapons to iron was a major advancement based on geological and metallurgical research, which catapulted humanity forward. Certainly, the approach to research taken in 500 B.C. would be far less formal than this modern era, but those advancements in research methods are, in fact, a product of research itself.

Within the social sciences, "professionals must be able to read the research literature in the field and apply it in their professional lives" (Cozby, 2007, p. 2). From counselors to social workers to teachers, research should have a close relationship with the professional practices.

Research across the sciences, social sciences, and humanities drives us forward as a species. Those just starting their journey as researchers with this text and, perhaps, an

associated class are joining an esteemed tradition of humanity that creates and curates new knowledge.

What is "research" in the social sciences?

Most research—whether in the natural sciences or social sciences—occurs informally (i.e., individual people making observations and gathering evidence about phenomena they witness). This text is about formal research, which is done systematically, intentionally, deliberately, with a set of recognized methods, and usually to be disseminated to a wider audience. Throughout the rest of this text, all references to "research" are about formal research.

Backing up though, what even are the social sciences? The Academy of Social Sciences (2024) defines them as, "…the study of people: as individuals, communities and societies; their behaviours and interactions with each other and with their built, technological and natural environments" (para. 1).

The social sciences include a variety of core academic disciplines that are focused on the application of a scientific approach to inquiry into human, social topics (exs., economics, sociology, and social psychology). However, the social sciences, broadly, also include professions that are extensions from those core fields, such as the disciplines of business, education, and social work (as well as some disciplines like medicine and nursing that can function as both natural and social sciences). These social science professions and the core disciplines are united in their methods of inquiry (i.e., research) and so they are lumped together in this text.

Social science research generally tries to emulate natural science research. "The" scientific method is nearly ubiquitous in the natural science curriculum en route to a high school diploma: observe, develop a research question and/or hypothesis, design and perform an experiment to test said hypothesis, analyze data, and form tentative conclusions. This process then may repeat indefinitely. (Note: There is no single scientific method, though loosely the steps above are common across scientific research.) Social science, however, is more variable than the natural sciences in not only *how* to do research but also in defining *what* constitutes research.

A Plethora of Definitions

Consider some of the following definitions of social science research (sometimes using "science" as synonymous for "research" and then applying it to the social science context):

- "Research is a process of steps used to collect and analyze information to

increase our understanding of a topic or issue" (Creswell & Guetterman, 2019, p. 3)
- "Research means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge" (Protection of Human Subjects, 2021, § 46.102(l))
    - "*Human subject* means a living individual about whom an investigator (whether professional or student) [is] conducting research" (Protection of Human Subjects, 2021, § 46.102(e)(1))
- "[to] gather information to answer a question that solves a problem" (Booth et al., 2003, p. 10)
- "the methods of scientific research in the behavioral sciences" (Cozby, 2007, p. 2)
- "Science refers to a systematic and organised body of knowledge in any area of inquiry that is acquired using 'the scientific method'… Science can be grouped into two broad categories: natural science and social science… social science is the science of people or collections of people, such as groups, firms, societies, or economies, and their individual or collective behaviours" (Bhattacherjee, 2019, p. 2)
- "Science is an effort to understand (or improve our understanding) of the world, with observable evidence as the basis of that understanding… One of the most important things to keep in mind about social scientific knowledge creation is that social scientists aim to explain patterns in social groups. Most of the time, such a pattern will not explain every single person's experience" (McKee, 2024, Section 1.1, paras. 4-5)
- "Research is the formal, systematic application of the scientific method to the study of problems; educational research is the formal, systematic application of the scientific method to the study of educational problems" (Mills & Gay, 2016, p. 5)

An Operational Definition for This Text

For the purposes of this text, we will use the following definition for research in the context of the social sciences: "Social science research is a systematic approach to the scientific study of people, from individuals and relationships to society, to generate new knowledge which is situated within the existing body of knowledge." The terms "social science research" and "research" will then be used interchangeably throughout. Here is what is meant by some key components in that definition:

- *systematic approach*: Formal research should be intentional, deliberate, and coherent. This is normally done by following methods that have been previously established and published, though that does not always have to be

the case.

- *new knowledge*: Research should result in new knowledge or, in other words, things we had not already identified through evidence before. That does, however, include replication studies, which are attempts to identically repeat a prior study for purposes like verifying or reinterpreting the original results, garner results chronologically later (i.e., 1994 knowledge may no longer be accurate in 2025), and create new knowledge that is intensely specific and/or for only local purposes (ex., a teacher's action research study in their own practice). Also, "knowledge" includes not just the existence of data but also the analysis and interpretation of those data.
- *situated within the existing body of knowledge*: Ideally, research should both originate out of and add to what we already know about a topic. For a study on the patient perceptions of nurse availability in a hospital setting, we might want to put those results in the context of prior research on the same topic/problem, nurse staffing issues, the role of nurses in a hospital, patient perceptions of healthcare generally, etc. Often, this happens through a literature review prior to study, a theoretical or conceptual framework for design and interpretation, and/or a discussion of implications the new knowledge has for practice, future research, and theory development.

Research vs. "Research"

One point of confusion here is that the term "research" gets used a lot in secondary and post-secondary education but in a way that only reflects a small portion of what research really is. As a "research paper" is assigned in, say, a sophomore sociology class, that usually is used to reference a student sifting through lots of other published knowledge and synthesizing that into a coherent paper. That is not really research, in a technical sense, within the social sciences. It certainly is a part of the research process, but it is misleading to simply label that "research." Research is the creation of new knowledge (as opposed to only summarizing/synthesizing others' research). Previous literature helps us avoid unnecessarily repetitive projects to what has been done before, discover what is and is not known about the topic, and then situate new research being conducted into that body of knowledge—but working with previous literature is just part of the start, not the totality or end, of what "research" is.

Types of Research

Research may be broadly categorized into two types: basic and applied. Basic research is the systematic collection and analysis of data to generate new knowledge for the sake of generating new knowledge, regardless of the current or future utility of that new knowledge. Applied research is the systematic collection and analysis of data to

generate new knowledge for a specific applied purpose. Basic research is very common in core natural science disciplines, such as chemistry. It makes sense, because that knowledge may not be useful until later when other knowledge is uncovered to give it purpose or may have important applications in a disconnected field (exs., medicine or astronomy). However, it is much less common in the social sciences, as most social research originates in an observed problem. With most social science fields being application oriented, it is relatively common for disciplinary social science publications to require a discussion of applications. Thus, most (but definitely not all) research in the social sciences is applied rather than basic, and that tendency varies directly with how applied the specific discipline is (ex., education being almost exclusively applied whereas sociology is more varied).

What is "action research"?

Action research is defined relatively coherently across social science disciplines, as illustrated in some examples below:

- "Action research is an approach to educational research that is commonly used by educational practitioners and professionals to examine, and ultimately improve, their pedagogy and practice" (Clark et al., 2020, p. 8)
- "Action research is defined as research that is conducted for the purpose of creating social change. When conducting action research, scholars collaborate with community stakeholders at all stages of the research process with the aim of producing results that will be usable in the community and by scientists" (Mauldin, 2020, p. 369)
- "Any systematic inquiry conducted by teachers, administrators, counselors, or others with a vested interest in the teaching and learning process or environment for the purpose of gathering information about how their particular schools operate, how they teach, and how their students learn" (Mertler, 2024, p. 311)
- "Action research methodology is a systematic research process that can be articulated by the researcher, involving data collection and analysis as well as reflection and discussion with coresearchers or others for the purpose of making change in a situation over time" (Moch et al., 2016, p. 3)

For the purposes of this text, action research is an iterative approach to applied research, which can use a variety of social science research methods for the purpose of addressing a local problem of practice or continuous improvement. Far greater attention will be paid to action research in a later chapter devoted to that topic; however, some degree of explanation is warranted here.

Action research is most often conceptualized in a spiral of some sort, such as Mertler's (2024) organization: Planning, Acting, Developing, Reflecting [repeat indefinitely]. In this simple approach, the Planning Stage is focused on identifying a problem, searching what is known about it from research, and developing a plan to investigate an intervention. The Acting Stage involves implementing the research plan and then gathering and analyzing data. In the Developing Stage, the scholarly practitioner comes up with an action plan based on the data analysis to improve practice, and then the Reflecting Stage is where they reflect on the action research plan and possibly share their results.

Consider the following as an example of action research. An elementary special education resource teacher has a new student at the school whose disability is one they have not encountered before, and they are unsure how to best serve that student. That teacher might start with a review of recent research on that disability and its support services within an educational setting. They then determine an appropriate intervention to try, which is then implemented. They collect qualitative data in the forms of their own observations, conversations with the student, and conversations with the student's parents to evaluate the intervention. Finally, they analyze those qualitative data to determine whether that intervention was effective and the develop an action plan for further improvement (which would then itself be re-evaluated in the next round of action research). This cycle could then repeat indefinitely, as the special education resource teacher attempts to refine and optimize their service model for that student and others like them.

Philosophical Commitments

Likely more so than other content in this book, this section is quite superficial. Most people, when considering doing their own research for the first time, just want to go straight into research design and data collection. "I've got this question I want answered, so let's go get the answer!" And, frankly, in a lot of applied research—both formal and informal, there is nothing wrong with that.

However, the reality is that much more is going on. Everyone comes at everything with certain presuppositions. A baby reaching for its bottle believes that reality exists and that the bottle is real; this is an extraordinarily basic illustration of ontological commitments. How does that baby know the bottle is real? Usually, that's through trial-and-error of perceiving a visual stimulus, touching it with their hand, and interpreting the touch stimuli of grabbing the bottle; that—again in the most basic sense—is epistemological. Then, as the baby pulls the bottle to its lips and takes a sip, they make a value judgment—is this liquid "good" and/or worth drinking? That is axiological.

Now, there are three forms of, perhaps, unfamiliar words in the paragraph above—epistemology, ontology, and axiology. Though most every society has these same concepts, these terms and their formal philosophical systems are most often tied to Greece (though these specific terms were developed by philosophers many centuries after the Ancient Greek civilization was gone). Outside of dissertations or expositions specifically on one of these topics, these three concepts are usually not named in published social science research studies, though they are sometimes represented with a single word for a specific type. However, to conclude that this means they are unimportant to research is wrong. They drive what is researched, how it is researched, why it is researched, and analyzing/interpreting meaning from data.

Because these are incredibly deep pools of possible beliefs and approaches, in each section, I will simply define the three terms and give an excerpt from my dissertation as an example of my own approach to each. Those wishing to learn more are encouraged to start with the *Stanford Encyclopedia of Philosophy* sections linked in the "Additional Open Resources" at the end of this chapter.

Epistemology

Properly and etymologically, epistemology is the study of knowledge. In practice, it is the study of knowledge/truth and how we know it. On the grand scale, the question of whether objective truth exists or not is, perhaps, the most well-known epistemological question.

In the excerpt below from my dissertation on epistemology, "constructivism" is the epistemological approach. Often in published research, that might (or might not even be) the only epistemological piece mentioned, like, "Coming from a constructivist approach, we designed this study to…"

> Constructivism provides the epistemological underpinning of the qualitative case study methodology (Stake, 1995; Yin, 2014). Constructivism is the belief that knowledge is constructed by people rather than being discovered (Stake, 1995), and both society and individuals engage in this construction of knowledge (Baxter & Jack, 2008). I have taken a particular constructivist perspective, described by Stake (1995) as acknowledging that an objective external reality exists but knowledge of it only exists after reality is interpreted by people and then integrated with the knowledge of others. The case study method itself serves as a practical outworking of constructivism as multiple data sources are gathered to construct the best understanding of the bounded case (Stake, 1995; Yin, 2014). (Olt, 2018, p. 62)

Ontology

Ontology is the study of being. More specifically and in practice, it is the commonly seen

as the study of what is or is not real and what the nature of existence is. For example, consider the proposition, often put forward in spirituality but also more broadly, that there is a human soul (i.e., that there is more to a human that the sum of their physical parts, with some essence existing at a higher level); that is an ontological debate.

Here is my dissertation excerpt on ontology:

> The philosophical branch of ontology questions what exists or is real (Creswell, 2013; Jacquette, 2002). However, for there to be a purpose to research, one must logically acknowledge the existence of conceptual reality. This basic confession of reality is the primary tenet of applied scientific ontology (Jacquette, 2002). In this study, I operated from this premise of applied scientific ontology as a foundation for Stake's (1995) constructivist approach to the case study method of qualitative research. (Olt, 2018, p. 62)

Axiology

Axiology is the study of worth, which in practice is the study of human values and value systems. Though tied in with other branches of philosophy, like ethics, this classic thinking prompt is heavily axiological: "If there is a train about to run over five elderly people on the main track but you can divert it to an alternate track where it would kill one infant, what should you do?" In this case, there is a value judgement—is the life of one very young person worth more than the lives of five very old people?

And so finally, here is my dissertation excerpt on axiology:

> Hiles (2008) noted that all research is infiltrated by the values of the researchers. This value perspective allows me to logically study the varying perceptions of people as their constructed knowledge and seek to interpret their collection of knowledge in a way that best represents their constructed social reality. I acknowledged my participants' values as subjects of study and valid within their own spheres of constructed knowledge. I was able to then engage with the participants in cooperative inquiry to best construct and report the reality of their situation (Hiles, 2008). (Olt, 2018, pp. 62-63)

How do we conduct social science research?

Social science research often struggles to live up to the ideal of the scientific method, like how the tight controls needed for an experimental design are often unattainable or even unethical for many or maybe even most social science topics. For example, let's consider a robust experiment on whether online or face-to-face instruction is better at producing learning gains among college students in College Algebra. There are a great many design considerations here that make this study challenging; however, this

topic would be seeking to evaluate within a semester-long course. How will students be assigned to online versus face-to-face class sections? To meet the standards of a true experimental design, we would have to have a large pool of students who are *randomly-but-representatively* assigned to the experimental (online) and control (face-to-face) groups. Unlike the Petri dish or test tube, social science research inherently involves people—living, breathing, sentient people. So, perhaps a student objects to this example experiment, saying, "But, I hate online learning! I don't want to waste a semester of my life doing something I'm going to fail at." To really retain our experimental design, we need that student and others like them to remain in (and potentially fail) the online format for College Algebra. However, even if we waive all financial costs for those involved in the experiment and agree to expunge final grades from transcripts at the participant's request, that student would still spend a full semester of wasted time, could lose motivation to continue their higher education, or might even face long-term psychological consequences like depression. Thus, many "experiments" in the social sciences often default to being quasi-experiments rather than a true experimental design, which could provide more conclusive results and potentially address cause-and-effect relationships among the variables.

Now we are left with the question posed in the section heading—how do we conduct social science research? That's a simple question with a complicated answer, and there are varying perspectives on the issue. For example, two of the largest approaches to social science research are quantitative and qualitative. While both seek to create new knowledge, they are different in almost every meaningful way. There are also different disciplinary perspectives; for example, the psychology field *does* tend to rely heavily on experimental research whereas the education field does *not*, and even inside of a specific methodology or method, the social work discipline may have a distinctive way of doing that thing as compared to the leadership studies discipline. Even some of the most fundamental positions—such as "a researcher should remain objective"—are hotly contested across ideological lines (ex., Matias, 2025). To the question of how one conducts research then, we might conclude that there are (1) some definitely right ways of doing things, (2) some definitely wrong ways of doing things, and (3) the other 98% of ways of doing things.

In this textbook, we endeavor to present a basic, balanced approach to research, and the primary focus at this level of text is on research literacy. However, we acknowledge that the personal backgrounds, education, and disciplines of the authors certainly affect how we present this information. What is presented in this text ought not be used to say "Oh, that other way is wrong!" but rather as the start of one's journey into social science research.

Key Takeaways

1. Social science research is about generating new social knowledge across a variety of disciplines.
2. There are a great many "good" approaches to doing social science research.
3. This is only the first chapter; keep reading!

Additional Open Resources

"Axiology / Value Theory" in the Stanford Encyclopedia of Philosophy (https://plato.stanford.edu/entries/value-theory/)

"Epistemology" in the Stanford Encyclopedia of Philosophy (https://plato.stanford.edu/entries/epistemology/)

"Ontology" in the Stanford Encyclopedia of Philosophy (https://plato.stanford.edu/entries/logic-ontology/#Onto)

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2

VALUES & ETHICS OF SOCIAL RESEARCH

Kevin Splichal

Definitions of Key Terms

- Academic Integrity: The commitment to and demonstration of honest and moral behavior in an academic setting
- Artificial Intelligence (AI): The theory and development of computer systems able to perform tasks that normally require human intelligence
- Beneficence: The quality or state of doing or producing good
- Ethics: Moral principles that govern a person's behavior or the conducting of an activity
- Institutional Review Board (IRB): An administrative body established to protect the rights and welfare of human research subjects recruited to participate in research activities conducted under the auspices of the institution with which it is affiliated
- Justice: A concept that includes "fairness in distribution" among participants / population groups and those receiving "what is deserved" (OHRP, 2022, p. 5)
- Respect of Persons: The concept that all people deserve the right to fully exercise their autonomy
- Transparency: The quality of being easy to perceive or detect
- Values: The regard that something is believed to deserve; the importance, worth, or usefulness of something

Ethics

The validity and credibility of social research hinges on the values, ethics, and care of the

researcher. Your position as a practitioner in a social science field and/or as a researcher depend upon maintaining honest and ethical practices. Haneef and Agrawal (2024) stated, "there are numerous ethical issues which are threats to the quality, originality, novelty, and integrity of educational research. These issues should be kept in view before conducting the research" (p. 30). As an ethical researcher, it is your responsibility to exhibit care and transparency with all aspects of the research process from literature review, methodology, selection of participants, internal review, data collection, analysis of results, and recommendations. This chapter highlights the values and ethics of social research by prioritizing key considerations, beginning with the Belmont Report.

The Belmont Report

Ethical considerations for human research have evolved since the Nuremberg Code of 1947 to encompass a wider range of protections for human subjects, specifically from the publication of the Belmont Report by the National Commission for the Protection of Human subjects of Biomedical and Behavioral Research in 1979. The guiding principles of the Belmont Report (1979) include respect for persons, beneficence, and justice but expanded in 1981 and 1991 to clearly define protocols for internal review boards and extend protections for human subjects such as with pregnant women, fetuses, neonates, children, and prisoners (Miracle, 2016). Institutions that host students or employees conducting research will generally have an Institutional Review Board (IRB) to ensure proposed studies are ethical. Further, any changes to the study's plan brought about by unanticipated problems or events, related to the participants or methods, should be reported to the IRB, allowing for complete transparency during the research process (Smith, 2024). Institutional review is required in organizations that receive federal funds, but it is normal even outside such settings. Most institutions will typically provide and require students to receive training on research ethics, most commonly through Collaborative Institutional Training Initiative (CITI), but this should not be the only safeguard to consider. As Serpico (2024) stated, "matters of ethical sense-making and problem-solving are unequivocally dependent on context and cultural responsiveness" (p. 567) and "protecting the rights and welfare of research participants we will never meet is an enormous responsibility" (p. 569).

Respect for Persons

The Belmont Report (OHRP, 2022) identified two ethical considerations for human research related to the respect for persons. First, human beings are autonomous. Individuals have the right to decide for themselves whether they would like to participate or not based on individual judgements which are suitable to their considered opinions and choices. Secondly, not all individuals are capable of self-determination. Illness, mental disability, age, or circumstances may severely restrict an individual's

liberty to decide for themselves. Differing situations or experiences could affect the voluntary nature of the research and the autonomy of participants. It is extremely important to provide all information to participants and reevaluate self-determination principles prior to the research of human subjects.

Beneficence

Beneficence is the ethical and moral obligation to protect participants from harm and secure their well-being. The Belmont Report (OHRP, 2022) offered two general rules in this regard: 1) do not harm, and 2) maximize possible benefits / minimize possible harms. Regardless of the benefit to the researcher or organization, protecting the individual(s) should be the guiding principle regarding human subjects. The researcher should clearly define and explain possible harms to participants, even when benefits may exist. For example, it is not uncommon for researchers to offer participants some sort of incentive for participating in a study but the incentive should never be significant enough to cloud the participant's understanding of possible harms to self or others. Ultimately, the responsibility for ensuring the beneficence of participants falls on the researcher(s), and so careful attention must be given by researchers to ensure the best possible outcomes for their research participants.

Justice

Researchers have an ethical obligation to be impartial with all human subjects involved in the research. Essentially, this is fair selection of participants (i.e., not taking advantage of disadvantaged groups, ensuring representative samples of the population being studied, etc.) and equally sharing the risks/rewards among participants. The Belmont Report defines how these burdens and benefits should be distributed: 1) to each person an equal share, 2) to each person according to individual need, 3) to each person according to individual effort, 4) to each person according to societal contribution, and 5) to each person according to merit (OHRP, 2022). An injustice occurs when some benefit to which a person is entitled is denied without good reason, or when some burden is imposed unduly.

Values

Values are the principles and beliefs that guide an individual's behavior and decisions. They reflect what is considered important, meaningful, and worthwhile. This includes how individuals conduct research. Every step and every process involved in the research helps shape our actions, relationships, and choices. Individual values serve as a foundation for how we interact with others and make sense of the world, influencing

both moral judgments and priorities. As a credible researcher, your actions should mirror the ethics of care by being transparent, objective, honest, and professional.

We recognize that there are many different values about research held by different researchers, and some areas can be quite controversial depending on one's views and philosophical commitments. The content in this section represents some of the most commonly held positions on values related to research and those put forward here as my positions to consider.

Transparency

By practicing transparency and honesty, researchers promote trustworthiness in their work and contribute to the integrity of the scientific community, both in the research processes and the research findings (Haneef & Agrawal, 2024). Researchers should never intentionally fabricate or falsify any segment of the research. This applies to the participants, findings, data, procedures, and policies. For example, Muthanna et al. (2024) stated that publishing multiple papers from a single study does not contribute to the value of existing literature and raises ethical questions about transparency and the integrity of the research process. Further, the deliberate omission or addition of data, simply to produce favorable results, is unethical and questions the entire research process. An ethical researcher discloses all relevant information to participants, thus ensuring that the study is conducted in a transparent manner (Um, 2024). A transparent researcher conducts research in a way that is open, honest, and clear, ensuring that all methods, analyses, and findings are accessible to others (and often, raw data as well). This allows the scholarly community to evaluate, challenge, and build upon the research. Transparent researchers have nothing to hide and produce nothing which may cause questions of integrity to emerge.

Objectivity

Awareness of one's biases is an integral component of being an objective researcher. Haneef and Agrawal (2024) stated, "by practicing objectivity, researchers can ensure the credibility and integrity of their findings and conclusions" (p. 32). Personal beliefs and biases should not interfere with the analysis of research data, especially when the findings do not align with the researcher's personal values or convictions. Peer and/or blind reviews can help to minimize personal biases. Every effort should be made to maximize the credibility and validity of the data. Further, omitting certain pieces of data because they do not align with the researcher's perceived values or beliefs changes the outcome and is an example of falsifying the results (Muthanna et al., 2024). The researcher should "aim for neutrality in all aspects of research, avoiding prejudice in planning, execution, and interpretation of experiments as well as in hiring choices and

funding applications" (Pirani, 2024, p. 98). Objectivity in research means remaining neutral by setting aside personal preferences or preconceived notions when gathering data, analyzing results, and drawing conclusions. This approach helps ensure that the research is credible, reliable, and can be trusted by others.

Pure objectivity is not possible for humans. It is an ideal we strive for in research and should hold high, but it is never something we'll perfectly achieve. Aristotle (350BC/1985) stated, "do not look for the same degree of exactness in all areas, but the degree that fits the subject matter in each area and is proper to the investigation" (p. 18). In other words, objectivity is never finalized. It is never complete. Objective researchers should strive for completeness while acknowledging that it is an ever-changing and evolving phenomenon when conducting human research.

Academic Honesty and Integrity

Integrity is about being honest and adhering to one's moral principles by avoiding plagiarism and the misrepresentation of academic work. Muthanna et al. (2024) stated, "while research ethics are principles and regulations for researchers to follow in conducting scientific research, research integrity is the practice of these codes" (p. 1). Um (2024) clarified, "honesty's moral ground is the respect for the 'right not to be deceived' (RND). Thus, an honest researcher would respect the subject's RND at least to the extent that circumstances allow" (p. 3).

An honest researcher adheres to the truth by being transparent and not deceiving others. The researcher should be straightforward and authentic through sincerity of words and actions. Aristotle (350BC/1985) spoke to being an honest and ethical individual by encompassing the moral capacity for being virtuous "at the right times, about the right things, towards the right people, for the right end, and in the right way" (p. 44). Being an honest person with integrity means being consistently truthful, transparent, and ethical. This means avoiding unethical practices such as plagiarism or misrepresentation of data, especially in social research. Marco and Larkin (2008) clarified numerous examples of unethical practices:

- Inaccurate reporting of missing data points
- Not reporting all pertinent data
- Failing to report the number of eligible participants
- Failing to report negative findings
- Being influenced by researched sponsors
- Inappropriately labeling graphs to magnify minor differences
- Reporting percentages rather than actual numbers with the intent to deceive
- Inappropriately apply gin statistical tests and reporting only the favorable results

- Reporting differences, although no statistical difference has been found
- Splitting data into multiple reports merely for the sake of increasing publications
- Using terminology without providing concise definitions, such as "rarely" or "commonly"
- Reporting conclusions that are not supported by data
- Exaggerating research results for publicity
- Ignoring previous work that challenges the conclusions

These examples are dishonest representations of social research and should be avoided. Honest researchers consistently practice an ethos of care for self and others by being responsible for their own work and the work of others. As a researcher, it is your responsibility to understand the importance of applying proper credit where credit is due. One of the most common unethical practices in social research is plagiarism. Even paraphrasing, often called "mosaic writing" becomes a problem when the intent is to deceive. Mosaic writing is the practice of changing certain words or phrases from a referenced work and weaving them into another author's words (Muthanna et al., 2024). Paraphrasing or summarizing another author's content into your own words is permitted if the researcher acknowledges the author and source. Again, transparency is key.

Dorbin (2023) found that students typically plagiarize for two reasons. One, students are disinterested in the topic or task, which results in a lack of commitment to academic integrity. Two, students plagiarize, because they do not understand what plagiarism is or what the policies of their institution are. To avoid plagiarism, it is essential to properly credit the original sources of ideas or data. Always cite references accurately according to the required citation style. Avoid copying and pasting directly from sources without proper attribution. Additionally, keep track of your sources throughout the research process to ensure you can attribute them correctly. By being diligent about citations and giving credit where it is due, you can help keep your work original and ethically sound.

Artificial Intelligence (AI)

The use of Artificial Intelligence (AI) in education is sparking controversy, yet in business and private sectors it is seen as a useful tool. Why? There are numerous institutional policies about plagiarism, and there are countless references to a "code of ethics" at local, state, and national levels. A course syllabus explains the importance of Academic Honesty/Integrity by clarifying academic consequences for unethical practices.

As social researchers, our concern is with an honest and ethical process utilized in the creation of any product. It should be based on knowledge and skill obtained through

research, instruction, and application, which are connected to relevant and meaningful educational settings for the good of our constituents. There is a measure of accountability for all stakeholders as a result.

Aristotle (350BC/1985) stated, "intelligence is a state grasping truth, involving reason, concerned with action about what is good or bad for a human being. Intelligence is concerned with action, not with production. For production has its end beyond it; but action does not, since its end is doing well itself, and doing well is the concern of intelligence" (p. 154). For example, writing a credible research paper that utilizes scholarly sources results in an "end" product. The product has its end beyond it since the process defines the intellect. The "action" or "process" is the measure of intelligence. Did the researcher seek truth in the "action" of developing the final product—the paper? This is key.

The use of AI can be a double-edged sword. With a basic skill-set, the use of AI can increase productivity and enhance the processes involved with scholarly writing. Alternatively, AI can pose risks for the researcher without proper guidance and understanding of their actions (Radday & Mervis, 2024). "Across disciplines, researchers face challenges in navigating ethical issues regarding emerging technologies and changing societal context. The dual challenge is that existing strategies for applying an ethical approach to achieving positive impact in research may not align well with emerging topics, and that there may not be clear consensus or established cross-disciplinary resources to support understanding and navigating the ethical dimensions of such work" (Knight et al., 2024, p. 2).

As AI becomes more and more robust, so does the likelihood that researchers will use artificial intelligence to enhance their research and scholarly writing (Gray, 2024). In fact, the more AI is utilized, the more "intelligent" the software becomes. More publications equal more enhancement for AI, building a more comprehensive database. The more we use this software; the more AI compensates. Bowen and Watson (2024) stated, "does it make sense to teach students that the use of AI is wrong if that moral stance will change the minute they graduate? All students will need training in thinking with AI and an understanding of how AI can be used – in any situation – with integrity" (pp. 132-133). Kahn (2024), emphasized, "What's more, used creatively, generative AI will be a boon to education, making it possible for every student to have a personalized tutor (Aristotle in your pocket), tailoring lessons to their individual pace and learning style" (p. 122). For example, students could use AI to find suitable sources for a research topic but should utilize their own intelligence and ability to synthesize the content to bring these materials together. The ethical use of AI will create a culture of honesty for the betterment of society (Doenyas, 2024).

Does this answer the question about what technological "tools" a person can or should

utilize, when showcasing intellect and creating some "product?" Autocorrect in word documents and emails has been around for quite a long time. Technology that corrects grammatical errors works automatically. More recently, AI can summarize entire works and write in styles that the author specifies.

Yes, you can use AI. Yes, you can use Autocorrect. Yes, you can use Grammarly to help with grammar, though caution is advised against allowing Grammarly to re-write content. (Of course, all as allowed by your course instructor and any other policies/ethical requirements to your setting.) These are tools that can help us learn, ultimately improving our skill. Credit must be given, however. Again, refer to Aristotle's definition of intelligence (Aristotle, 350BC/1985). The product is not independent of the action used in the creation of the product. Are you seeking truth through proper reasoning? In what way do you hope to benefit, and for what reason? Are you plagiarizing and using AI for a grade, promotion, publication, recognition, or acknowledgement? Or, are you building your intelligence by using the resources available AND being honest throughout the process?

[Editor's Note: Because of how rapidly AI is evolving, this section may be regularly updated without a new edition of the book in order to keep it current and accurate.]

Conclusion

Values and ethics in social research refer to the principles and moral guidelines that researchers follow when conducting studies involving people, communities, or societies. Values influence the goals and direction of research, reflecting the importance of integrity, respect, and fairness. Ethical considerations ensure that researchers prioritize the well-being and rights of participants, maintain confidentiality, and avoid harm. This includes institutional review, informed consent, transparency with research methods, and avoiding manipulation or bias. Upholding these ethical standards in social research fosters trust, enhances the credibility of the findings, and promotes responsible and humane practices in the research process.

Key Takeaways

1. Ethical research insists on the due diligence of the researcher, paying particular attention to the processes and procedures for conducting, analyzing, and reporting research. Respect for persons, beneficence, and justice constitute the ethical framework for social research, emphasizing care for all persons directly and indirectly affected in the research
2. Credible, noteworthy research adheres to trusted moral standards. Transparency, objectivity, and honesty are the researcher's most valuable ethical considerations and are the foundation

for ethical social research

Additional Resources

Collaborative Institutional Training Initiative (CITI)

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3

THE USE OF LITERATURE IN CONDUCTING SOCIAL RESEARCH

Reade Dowda

Definitions of Key Terms

- Continuing Education Units (CEUs): Education that adds to the skills or knowledge of a professional, but is likely not college credit
- Imposter Syndrome: A psychological phenomenon where a person feels inadequate and often doubts their abilities even though they have the education or experience and achieve well. May have trouble taking credit for their own accomplishments
- Literature Map: A visual representation of the resources included in a literature review
- Literature Review: An in-depth summary of existing research on a particular topic
- Research Design: A strategy to conduct research, including collecting and analyzing data
- Seminal: Research which strongly influenced later development

The use of literature is of paramount importance when conducting research projects. Reviewing existing literature is a common and simple way to become knowledgeable about a topic. Researchers in the social sciences build their cases for their projects by examining existing literature. The existing literature can answer many questions. For example, how will their new research project add to the existing literature? What have other researchers concluded about a particular topic? Has their research already been conducted and published? You will understand the value of conducting a review of the

literature for your chosen project, how a literature review can aid in your professional growth, and basic steps to perform a literature review after reading this chapter.

Why Do I Need to Conduct a Literature Review?

Reading the previous chapters is likely to have you thinking about a research project. Jumping right into your research project may seem like the best and most exciting way to move forward. However, reviewing what has been written previously will be remarkably beneficial to your future research. Researchers may define a literature review differently, but many researchers see the value of revisiting past work and posit the literature review dictates the direction of the current research (Creswell, 2012; Hays & Singh; 2012; Maxwell, 2005; Onwuegbuzie & Weinbaum, 2017). The literature review helps describe how your research fits into previous research, how it adds to the literature, and what theoretical framework guides your research (Maxwell, 2005). Hays and Singh (2012) asserted "a review of the literature sets the proposed research in context, frames it within what has already been done, and provides a rationale for the current investigation (p. 115). The literature review may help define the research problem or what Creswell (2013) called the "need for the study." The literature review answers the "so what" question about your research; just because it can be conducted does not mean it should be conducted.

Does My Research Need to Be Conducted?

Conducting a literature review will expand your knowledge on the topic you wish to research. For example, you can identify seminal publications that have influenced research on your chosen topic. Citing these seminal sources within your research project accomplishes two important aspects of research. First, citing major contributions adds to the legitimacy of your research. Second, citing previous research acknowledges the hard work of past researchers. As a community of scholars, we learn that adding to existing literature through original research takes time and can be challenging, therefore, citing past literature recognizes the accomplishments of previous researchers.

Diving into previous literature can guide your research study by identifying important contributions and authors related to your study. For example, identifying one major author can lead to other contributions from that author and aid in building your literature review. Your review initially starts out wide like the top of a funnel, but the more you expand your knowledge, the better able you are to narrow the information down like the tip of a funnel.

Literature is used differently for those conducting action research, program evaluation,

and certain other applied research approaches. In those cases, the need for the study is determined locally, rather than from the existing research literature. That existing research literature is rather used to contextualize the problem, identify what is known about the phenomenon and/or intervention, and explore similar settings to what is to be studied locally.

Where Do I Find Literature to Use?

Published literature is readily available as scholarly articles and books in libraries and online. For example, students at a university have much access to research sources from their institution. These resources may include government documents or handbooks and encyclopedias. Many institutions also have a writing center which will have many resources to help your research.

Once you find an article that relates to your topic, the references of that article may lead you to additional resources and authors. Remember that professors, librarians, and others in your field are here to help you as you navigate your research project. These people with more research experience are great resources to discuss your project with and aid in finding relevant literature. There are also search engines aimed at research, such as Google Scholar, which allow you to search for scholarly work for free. Furthermore, Howland et al. (2009) claimed using Google Scholar may provide more resources than merely using traditional searches. Using multiple ways of searching for resources is especially important if finding information related to your research topic is challenging.

The Use of Artificial Intelligence (AI) in Reviewing the Literature

Employing AI to aid in conducting research is becoming more popular, and perhaps the most useful place to use AI is in the literature review. Using AI in conducting a literature review can identify potential sources and provide preliminary summaries. The use of AI may help a researcher sift through large numbers of sources in a small amount of time. AI is advancing quickly and may be a useful tool in reducing some of the more time-consuming steps of reviewing literature. However, make sure to check assignment guidelines, publication venue expectations, and/or institutional policies prior to conducting a review of the literature to make sure the use of AI is acceptable.

The Use of Literature & Best Practices

Performing a literature review can identify credible sources such as peer-reviewed journals, books, encyclopedias, and government documents instead of non-peer

reviewed sources such as blogs or websites. Conducting a literature review may also show a gap in the literature. A gap in the literature means something is missing and further research needs to be conducted (Aveyard, 2023; Lunenburg & Irby, 2008). Identifying a gap in the literature can help narrow your research project. For example, maybe research has been conducted with a particular population, but needs to be conducted with a different population.

To illustrate, reviewing literature could be beneficial for mental health professionals who are new to the field or working with an unfamiliar diagnosis. If they were treating a person with depression, performing a review of literature regarding techniques or interventions that have been empirically validated related to treating depression can be greatly beneficial to the client. Implementing empirically validated theories and interventions may also be required when billing insurance companies.

The Use of Literature & Self-Care

Not only can research a particular area of concern produce helpful outcomes by those being served in a social science profession, it can also contribute to the wellness of practitioners. Reducing anxiety and being prepared for those you serve can be part of a beneficial self-care routine. For example, reviewing literature can ameliorate the anxiety of a mental health professional who is working with a new diagnosis or someone who is new to the field in a number of ways. Competence and effectiveness have been identified as the top two worries of counselors-in-training (Jordan & Kelly, 2004). Reviewing the literature related to theories and interventions can build confidence and expand the knowledge of mental health practitioners. Learning how to conduct a review of the literature during a graduate program can have benefits that last well into a person's career.

Imposter syndrome often plagues many new graduates. Am I good enough to be teaching this topic? Am I good enough to be working with these clients? New graduates often doubt their abilities. A short review of literature related to the contributions of beginning counselors can demonstrate that those new to the field have the latest education, are up to date on ethical codes, and often start with a positive attitude and motivation which can be contagious to those who have been in the field for decades (Fall et al., 2003). Whether someone new to their field is struggling with imposter syndrome or anxiety, the use of literature is an easy and common way to improve confidence and effectiveness.

The Use of Literature & Publishing

Peer-reviewed journal articles require much smaller literature reviews than a thesis

or dissertation. Literature reviews that merely gather information are not usually publishable; but literature reviews that synthesize the information may be published on their own, because much information is gathered into one resource for others conducting research or practitioners learning more about a particular topic (Watts, 2011).

Reviewing literature is so important to the research study that it is the second chapter of dissertations and often written before the introduction (Lunenburg & Irby, 2008). Why would the second chapter be written before the first? As stated before, existing literature helps define the need for research. Your literature is often revisited at the end of your research project to legitimize the current study (van der Waldt, 2021). For example, your study could confirm the findings of previous research or fill a gap in existing literature. Another reason good literature reviews are important is peer-reviewed articles with poorly conducted literature reviews are less likely to be published (Onwuegbuzie & Daniel, 2005).

If you plan to submit an article for publication, find the journal you would like to submit the article to and look up their submission guidelines. These guidelines will give you much useful information such as page requirements, writing style, and deadlines.

The Use of Literature & Ethics

As previously stated, the use of literature can help enhance self-care. Self-care is directly related to many ethical codes in the social sciences. "Self-care is not a luxury; it is an ethical mandate" (Corey & Corey, 2016, p. 358). Ethically, we must take care of ourselves if we are to take care of others. The best thing we can bring to a practitioner setting is a healthy us.

Reviewing literature also keeps professionals up to date on the most recent ethical codes and concerns. For example, when diagnoses and guidelines are updated, the literature is where we go to understand the new updates. These changes in professions are why most professionals are required to get a certain number of Continuing Education Units (CEUs) before renewing their license. Often, reading existing literature and taking exams will satisfy the CEU requirement.

How to Create an Effective Literature Review

One of the first actions I take in creating a literature review is to dedicate time to reading. If you do not have time to read existing research, then you do not have time to conduct new research. "Your attitude as a researcher is critical. First, you must think of yourself as a researcher and writer, and not just as a graduate or doctoral

student" (Lunenburg & Irby, 2008, p. 28). If you are reading this, you have likely already successfully navigated an undergraduate degree and are enrolled in a graduate program. Lean into your previous success and how the knowledge you have already earned can be applied to research. As previously stated, the best way to expand your knowledge is to read what has already been published.

Narrowing down a list of key words to help you search for resources is an important initial step (Creswell, 2012; Hays & Singh, 2012). After creating a list of key words, decide where to begin your search, such as the university library. Most libraries will have an online search engine. Not all libraries will have every resource available, but you will likely be able to get most resources through interlibrary loan (ILL). Interlibrary loan is a way to request resources from other libraries through the library you have access to which exponentially expands the amount of information available to you. If you use the internet to search for sources, remember to be cautious and double check the credibility of the source.

The amount of information available can be overwhelming at first. Organize your literature review like a funnel where broad information is at the top and more detailed information is at the bottom. Older resources or resources that barely meet your criteria may belong at the top of the funnel and beginning of the literature review, while resources more specific to your research project belong at the bottom of the funnel and later in your review (Lunenburg & Irby, 2008). When organizing your research, you may have to choose articles based on the requirements of the project. For example, many classroom projects only allow using resources that are five to ten years old. This date restriction may not extend to seminal research, which are more historical resources that significantly added to the literature.

Once you collect a few resources related to your study, then you begin to critically analyze them and see how they relate to your proposed study. Those at the top of the funnel will only be discussed briefly while those towards the bottom of the funnel relate more closely to your research and should be discussed in greater detail (Lunenburg & Irby, 2008). Some researchers recommend using a literature map (Hays & Singh, 2012; Lunenburg & Irby, 2008). A literature map visually shows how your study fits into the existing literature and how your resources relate to each other.

After analyzing and organizing your literature, the time has come to write your literature review. You should celebrate this time because you have put much work into reading and choosing resources that relate and possibly validate your research. As previously stated, the closer the resource relates to your study, the more detail you should include. In the beginning of your study, you use literature to prove why your study is important. When you come to the discussion or conclusion of your research paper, revisiting important resources shows how your results fit into existing literature.

For example, your study may confirm past research or provide a new direction based on differing results.

Practical Considerations in Writing a Literature Review

When writing a literature review, you should not summarize source-by-source; rather, your goal should be to write a coherent narrative of what is known about the topic you are researching. Think of the writing style by asking yourself, "If there were no sources cited here to visually clutter this part of my paper, does this explain what I want it to explain to my readers?" Obviously, you must cite sources in the literature review, but this question should help guide your writing style. You should also seek to synthesize ideas from your sources, which Purdue OWL (n.d.) described as when the researcher "collects key sources on a topic and discusses those sources in conversation with each other" (para. 1). That synthesis should be citation-rich and not rely heavily on direct quotes. Consider the following as an exemplar of the writing style in a literature review:

> Mendez, S. L., Tygret, J. A., Bruwer, A., & Haynes, C. (2025). Critical components of successful cross-race mentoring relationships: Perspectives of mentees and mentors. *The Qualitative Report, 30*(1), 3010-3023. https://doi.org/10.46743/2160-3715/2025.7186

There are some differences of opinion in exactly how the literature review should be structured or if it should vary by methodology; however, a general concept is that you will have two to four major topics and then demonstrate the gap in what we know about the topic that your study will help fill. The topics in a literature review should help your readers understand the major sub-topics and any existing knowledge that is closely related to your study. For example, if you were to research the impacts of poverty on early elementary academic achievement in a specific geographic area, you might utilize the following topics in your literature review: (1) poverty in the United States generally, (2) academic development in the early elementary years, and (3) the impacts of poverty on academic achievement generally. Then, you could conclude that literature review section noting that there have been no studies of this specifically on the early elementary years nor in this specific geographic region (ex., Kansas City, Missouri). Your study will help fill those gaps.

Finally, the question arises as to how comprehensive a literature review should be. Expectations scale widely based on the purpose of the project. A thesis or, especially, a dissertation might have a literature review that spans dozens if not a hundred pages. In a journal article-length paper, the literature review might be only 700 words. Before beginning your literature review process, consult instructions from your institution or intended publication outlet.

Conclusion

Whether you are writing a small research paper for a class or a large dissertation for a doctoral program, the use of literature is beneficial from the beginning to the end of your research project. A literature review at the beginning of a research project guides your topic and research problem. Literature is used at the end of a research project to validate findings.

Key Takeaways

1. A literature review is often required in academic writing.
2. The use of literature builds a foundation for understanding the research problem.
3. Existing literature guides your current research.
4. Using literature in social research is a common way to expand knowledge about a research topic.

Additional Open Resources

Purdue Online Writing Lab (OWL). (n.d.). *Writing a literature review.* https://owl.purdue.edu/owl/research_and_citation/conducting_research/writing_a_literature_review.html

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4

THE ROLE OF THEORY IN SOCIAL RESEARCH

Phillip Olt

Definitions of Key Terms

- Action Research: An iterative approach to applied research, which can use a variety of social science research methods for the purpose of addressing a local problem of practice or continuous improvement.
- Basic Research: The systematic collection and analysis of data to generate new knowledge for the sake of generating new knowledge, regardless of the current or future utility of that new knowledge.
- Conceptual Framework: A framework based on something other than a social theory that is used to guide research design, interpret findings, and suggest future applications or extensions of the research.
- Descriptive: A social science theory that explains a social phenomenon solely by using data and analysis.
- Normative: A social science theory that explains a social phenomenon through the lens of a value judgement about how things *ought* to be.
- Occam's Razor: The simplest explanation is usually the best explanation (aka, the Parsimony Principle).
- Scientific Theory: A coherent and consistent explanation for a phenomenon that is derived from repeated hypothesis testing through scientific methods, and it is a concise, coherent, and general statement of the conclusion. However, theories are always tentative and subject to revision or complete rejection, should the above-mentioned processes later generate results that lead to such conclusions.
- Social Science Theory: An explanation for a social phenomenon, which can be used in two

ways: descriptive (*based solely on data to explain the phenomenon*) and normative (*introducing value judgments about how things ought to be*). Unlike scientific theories that should have no or almost no exceptions, social science theories typically describe patterns but embrace the commonality of exceptions.

- Theoretical Framework: A framework based on a social theory that is used to guide research design, interpret findings, and suggest future applications or extensions of the research.

What is a "theory"?

> Coworker A: *Again?! That's the third time this week someone's eaten my sandwich! They need to padlock this stupid shared refrigerator for the office.*
>
> Coworker B: *Any idea who's taking your food?*
>
> Coworker A: *Well, I can't be sure, but I have a theory about that...*

The term "theory" is fraught with misuses, variable meanings in different settings, and even petty academic disciplinary disputes. As in the vignette above, "theory" is often used in society and pop culture as anything from a gut feeling to an educated guess. Ask a physicist, and they will have a *very* rigid definition of "theory" held tightly by the natural sciences. Ask a social scientist, and you will likely get a much less rigid answer than the physicist gave but still one that is veiled in scholarly language. Then go back and ask the physicist what they think of the social scientist's definition of "theory," and you might just end up with a fist fight on your hands…

So, perhaps a prerequisite to defining "theory" is establishing *who* gets to define it. As this is a text on social science research, deference will be given to the social science definition. However, as social science is an approximation of the natural sciences and their methods, it is relevant to consider that definition as well.

Natural Science Definition of "Theory"

As with "the" scientific method, there is no single, all-encompassing definition of theory in the natural sciences. As this is a social science text, this concise explanation of the term "theory" in the natural sciences from the University of California Berkeley Museum of Paleontology will suffice:

> The process of science works in much the same way whether embodied by an individual scientist tackling a specific problem, question, or hypothesis over the course of a few months or years, or by a community of scientists coming to agree on broad ideas over the course of decades and hundreds of individual experiments and studies. (2024a, para. 1)

> In science, a [theory is a] broad, natural explanation for a wide range of phenomena. Theories are concise, coherent, systematic, predictive, and broadly applicable, often integrating and generalizing many hypotheses. Theories accepted by the scientific community are generally strongly supported by many different lines of evidence-but even theories may be modified or overturned if warranted by new evidence and perspectives. (2024b, para. 1)

More succinctly, a theory within the realm of natural sciences is derived from repeated hypothesis testing through scientific methods, and it is a concise, coherent, and general statement of the conclusion. However, theories are always tentative and subject to revision or complete rejection, should the above-mentioned processes later generate results that lead to such conclusions.

Social Science Definitions of "Theory"

In the social sciences, the term "theory" is commonly used in two ways: descriptive and normative. The primary distinction between these two uses is that normative social science theories introduce value judgments (i.e., how things *ought* to be). Both commonly utilize inductive and/or deductive reasoning. One way to think about the two is that descriptive social science theories are social but with an emphasis on science, whereas normative social science theories are social but with heavy influence from philosophy and/or the humanities.

Unlike scientific theories that should have no or almost no exceptions, social science theories typically describe patterns but embrace the commonality of exceptions. Humans are fickle creatures!

Descriptive Social Science Theory

A descriptive social science theory is simply an attempt to explain ways that social things generally happen. These should be consistent, tightly bounded for variables and settings, and clear. For example, one might utilize the qualitative methodology of grounded theory to create a model of how cisgendered female high school seniors identify their future collegiate major. There are no ideological commitments (in the politicized sense) and no judgments about how they *should* select a major. Such theories are purely concerned with how something happens and, normally, the prediction of future happenings.

Normative Social Science Theory: Two Approaches

Normative social science theories really fall into two categories.

First, there is the descriptive-plus-value approach. Extending the illustration from the

previous paragraph, the theory would become normative when it goes beyond just describing how those students select their majors and also infuses it with perceptions about causes and/or prescriptions about what *ought* to be. A critical theorist might look at the results of that grounded theory and perceive how societally-imposed gender norms have a significant—and perhaps preeminent—impact on those decisions (critical theory being, perhaps, the most impactful normative social science theory in the 2010s-2020s). It is unlikely that high school students would understand their major choice in light of broad and vague societal impacts, thus the critical theorist might see the descriptive theory as woefully inadequate. They might then infuse that "empirical investigation" with "utopian speculation" (Brookfield, 2005, p. 27), suggesting that societal gender norms more accurately or completely describe *how* cisgendered female high school seniors select their future college major than what the participants themselves described. Thus, the grounded theory becomes not just about the participants' perceptions and feelings but also an infusion of the researcher's contextualization and interpretation.

Second, there are normative social science theories that either start or perpetually remain only normative, *prescribing* what *ought* to be. Now, that is not to say that such normative theories do not have research done that supports them; however, that occurs more indirectly than either being done foundationally to establish the theory in the first place or to extend it. Most religions contain this type of normative social theory (ex., Judeo-Christian morality); there are right and wrong ways of doing society and human behavior, but those are not derived from research but rather sources like divine revelation or human spiritual intermediaries. As mentioned in the previous paragraph, critical theory is probably the most impactful normative social science theory, and it falls into this second category. There absolutely are extensive research studies done on topics and aligned in support of critical theory's tenets; however, as Brookfield (2005) observed, "verification of the theory [critical theory] is impossible until the social vision it inspires is realized" (p. 29). It is not so much about testing and/or refining critical theory as it is about implementing a grand vision of how society ought to be.

How is theory actually used in social science research?

At the most basic level, social science research uses theories to advance knowledge at a larger scale than would naturally happen with isolated studies. Theory helps coalesce knowledge to explain specific phenomena, which in the social sciences is often explaining how or why something social happens.

Descriptive theories often prompt further research and guide practice. Such theories should be relatively consistent across time and place, thus practitioners should be able to apply descriptive theories into their related practice without much difficulty. Research

studies using descriptive theories typically generate more data across time, place, and demographics that support the theory.

In normative theories, those extensions might come from conceptual applications to a new population or setting as well as aggregating existing research to demonstrate alignment. For example, Phillips and Lincoln (2017) extended critical theory to apply to military veterans. While that theory originated with socioeconomic classes and then later included race/ethnicity and sex/gender, veterans were a more specific and smaller population subset that was not tied in until decades later. They argued that veterans were an historically marginalized population (a conceptual extension of the original theory), which they supported with the existing knowledge base (demonstrating "veterans" as a marginalized group to align with the original theory).

Theoretical (and Conceptual) Frameworks

While the specifics of how research frameworks are used and discussed will vary by the type of research being conducted and the nature of the publication, having a theoretical or conceptual framework is a normal—but not mandatory or universal—part of a social research project. For example, a practical action research study would likely not use one. The two are closely related concepts, with a framework being theoretical because it uses something formally classified as a theory, while a framework is conceptual if it is using something *not* formally classified as a theory. However, both theoretical and conceptual frameworks are used similarly in research studies.

Theoretical/conceptual frameworks are used to guide research design, interpret findings, and suggest future applications or extensions of the research. In research design, theoretical/conceptual frameworks are often used to develop questions or define variables based on previous research associated with the theory. So, for example, if a theory suggested that you should find A, B, and C; then in your research design, you would ask questions to find if A, B, and C were present. Then in analysis and/or interpretation, one would specifically look for A, B, and C. If this were a qualitative study, the coding, categorizing, and themeing would be defined by A, B, and C (though that does not preclude the possibility that those items are not found in the new data set). Finally in suggesting future applications or extensions, it is common that the researchers propose ways in which the theoretical/conceptual frameworks might be taken one step further than the present study. Continuing our example, that might be that future studies should look for A, B, and C among some different demographic group.

Theory-less Research?

However, not all research *has to* create, expand, align to, or interpret data with a social

science theory. Such research that does not use theory tends to be at two ends of the research spectrum. On the one side, some basic research (but definitely not all) does not use theory, as it is simply collecting and analyzing data for the sake of knowledge. However, it is then common for secondary research to occur as others use that data and interpret it with social theories. On the other side, many types of applied research (especially, practical action research) do not need theory to accomplish their purposes; they are being done solely to solve a local problem. Once the problem is understood, a solution is tested, and tentative conclusions are made, there is no need for greater context or tying to a grand scheme of explaining human behavior. Additionally, some research is meant to be purely based on participant views without adulteration (such as qualitative description and much phenomenology, described in a later chapter on the types of qualitative research).

Occam's Razor

In its most basic form, Occam's Razor, sometimes called the Parsimony Principle, suggests that the simplest explanation is usually the best explanation (originally, "plurality should not be posited without necessity" (Duignan, 2024, para. 1)). The reasoning is that each assumption that is introduced is possibly incorrect. The more assumptions there are in an explanation, then the more probable that there is an error. However, that also does not mean the simplest explanation is always right.

This system of interpretating of data and analysis makes sense in the far more predictable natural sciences. If the temperature of water in a container rises as it sits atop an active heating element, the most reasonable conclusion is that the heat is being transferred from the heating element to the water. Of course, that is not always the case. The room temperature could be rising and be contributing to the rise in water temperature. A malicious lab assistant seeking to skew the experiment could have poured some super heated metal into the water container moments before measurement. We could continue to list reasons why the water temperature is rising apart from the simple explanation of the heating element transferring heat to the water; however, the simplest and most likely explanation for this rising water temperature is that the burner beneath it is on.

The social sciences are not as predictable as the natural sciences, at least in the sense of consistently following laws. If that were the case, we would have little need for courts and lawyers! While Occam's Razor may be best for evaluating individual circumstances, it does little to tie those together for generalized or broad explanations of social phenomena. Thus, social science research has increasingly skewed toward favoring (or demanding) theoretical tie-ins to almost all published research, and so it is easy to assume that social research *must* have theory. That is not the case, and in much applied

research, Occam's Razor applied by expert knowledge is sufficient (or even best). But, if you seek to publish in scholarly outlets or work in academia, you may find theory to be less optional.

Key Takeaways

1. Social science theories are far less concrete and consistent than those in the natural sciences.
2. Social science theories can be either/both descriptive or/and normative.
3. Social science theory is commonly used in research to guide research design, interpret findings, and suggest future applications or extensions of the research.
4. Though it is normally used, not all social science research (ex., practical action research) needs theory.

Additional Open Resources

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Phillips, G. A., & Lincoln, Y. S. (2017). Introducing veteran critical theory. *International Journal of Qualitative Studies in Education, 30*(7), 656-668. https://doi.org/10.1080/09518398.2017.1309586

UC Museum of Paleontology. (2024a). *How science works: Science at multiple levels.* https://undsci.berkeley.edu/understanding-science-101/how-science-works/science-at-multiple-levels/

UC Museum of Paleontology. (2024b). *Glossary: Theory.* https://undsci.berkeley.edu/glossary/theory/

5

THE RESEARCH PROCESS

Phillip Olt

Definitions of Key Terms

- Applied Research: The systematic collection and analysis of data to generate new knowledge for a specific applied purpose.
- Basic Research: The systematic collection and analysis of data to generate new knowledge for the sake of generating new knowledge, regardless of the current or future utility of that new knowledge.
- Delimitation: Factors that define the limits of your study, which is inherent to the design and scope of the study.
- Hypothesis: An assumption to be tested that attempts to explain the relationship between certain variables.
- Limitation: A factor that limits your study, usually arising during the study and outside of researcher control.
- Positivism: The belief that objective truth exists and is knowable through (and only through) scientific methods.
- Post-Positivism: An extension of Positivism, holding that objective truth exists but is only knowable by humans in part and contingently.
- Problem Statement: The explanation of a current human/social problem to be addressed through applied social research
- Purpose Statement: The statement by a researcher how the purpose of their research study, usually articulating how they hope to help address the problem in the problem statement
- Research Question: A clear and precise question about a singular item to be measured through the research study

Getting Started with Getting Started

As a way of illustration, let me share about my work in writing this textbook. I served as the editor, as well as authoring the front matter, back matter, and eight of the chapters. For some reason, this chapter was a mental block for me. Every time I went to work on it, I found an excuse not to, whether that was writing another chapter or doing something altogether different. And so, this chapter sat completely not worked on for half a year. I would scroll past it only to feel anxiety and embarrassment for not doing anything with it. It is important to note here too that no one else could even see what I had or had not worked on throughout the process; that was all in my own head, heart, and soul. Eventually, I became self-aware of how much anxiety I was having about writing this chapter, and great irony dawned on me—I was struggling greatly to get started writing a chapter about helping people to get started writing. Thankfully, this realization also proved to be the spark I needed to get in here and write this very chapter.

I share this here for a couple of reasons. First, *everyone* (perhaps an over-generalization) struggles with scholarly writing. Whether we call that writer's block, anxiety, or whatever, it is not just you. Second, the most important thing to getting started with research and/or writing is to start researching and/or writing.

So, whatever is holding you back from getting started, follow the Nike slogan—Just Do It! I do, however, recognize that is rarely easy, even evidenced here by my own struggle of postponing work on this chapter. However, I felt significantly better once I started working on this, and it is very likely you will feel that way too after you take the first steps on whatever it is you are not making progress on.

Preliminary Refinements

The process of getting started on a new research project is best seen as refinement from broad → specific, with the preliminary steps going from: Research Topic, Research Problem, Purpose Statement, to Research Question(s). This process is generally described in a similar fashion across social research methodologists and textbooks (for example, see Creswell & Guetterman, 2019).

Preliminary Step 1: Selecting a Research Topic

The broadest of the four steps, a researcher must first select their topic. Now, "broadest" should not be interpreted to the extreme, such as, "my topic is 'humans;'" however, it is somewhat squishy to define in an absolute sense. So, here are some examples of topics for social research:

- Microeconomics of family budgeting
- Poverty in America
- Science education

Exactly where one draws the line on what is technically a "topic" really does not matter much in practice though, as the research problem (see below) is really the broadest/highest level that one sees articulated with focus in a research study. Even when a research problem is included in the write-up of a study, it is rarely labeled that way but rather implied through the Introduction and/or Literature Review sections.

That, however, still leaves the question of how one selects a topic. Cozby (2007) proposed five sources of ideas: common sense, observation of the world around us, theories, past research, and practical problems. Mills and Gay (2016) listed four sources: theories, personal experiences, previous studies, and library searches. I believe, however, that this is best distilled down to two categorizations.

1. Sometimes ideas come from existing research, whether that is from reading published literature or attending an academic conference or extending a descriptive theory or even a dissertation supervisor compelling a topic closely related to their expertise and existing research.
2. Often, however, it comes from personal experience. That might look like, "I was a high school social studies teacher, so now I'm interested in researching that." Or, it might be researching a demographic group of which you are/were a member (ex., "I am a Native American, and now I am interested in researching the lived experiences of Native Americans on reservations").

Some scholars, however, look down upon people researching things related to their own experience, pejoratively called "me-search" as a play on words. It can be cast as inferior, because the researcher is then not bringing an unbiased perspective. However, as social research increasingly skews away from positivism and post-positivism (which will be discussed more in subsequent chapters), me-search has become far more accepted as just "research" and maybe even the norm.

Example Research Topic

Here, and in the subsequent sections on the other preliminary steps of the research process, I will again utilize my dissertation to illustrate (Olt, 2018). Often, in journal article-length manuscripts (which is most published social science research), the topic and research problem are implied rather than stated as such with dedicated content. In that study, my research topic was:

> regulatory compliance in higher education

Preliminary Step 2: Articulating a Research Problem

Applied research is far more common than basic research in the social sciences, and applied research must have a problem to address. Chappell and Voykhanksy (2022) described such problems as, "specific challenges… needing systematic and objective investigation to find a solution, test a theory, determine cause and effect, or find effective strategies that address the issue" (p. 26). Defining a research problem is, in applied research, the first step of refinement below the topic, and as such, it narrows the focus from "all of <the thing>" to "a specific facet of <the thing>." Here again, what problem to research inside of a topic is determined by the researcher using the existing research and/or the researcher's interests or experiences. The research problem (or "problem statement") is often implied in journal articles, rather than written explicitly, somewhere in the Introduction and/or Literature Review sections; however, it will likely have its own dedicated section in a thesis or dissertation.

The content of a problem statement will vary. However, it should lay the groundwork for why the study is needed. That commonly means explaining what the problem is and how it is *not* addressed adequately in this existing research.

Example Research Problem

Below is the paragraph-length problem statement from my dissertation:

> At a small liberal arts college (SLAC), faculty and staff members are often stretched to meet the same compliance requirements as an institution classified as R1–Highest Research Activity by the Carnegie Classification of Institutions of Higher Education

> (2017), although their funding and staffing may be far less. The R1 institution may be burdened, but it is large enough to benefit from the size of its staff and has a flow of research grants and state funding. A SLAC, especially if private, is structured and funded quite differently. Bok (2013) juxtaposed multibillion dollar endowments at an R1 against the struggle for survival at many SLACs. Commonly, a collegial institution as described by Birnbaum (1998), a SLAC is generally centered on teaching and close relationships with students, without the research emphasis present at other types of institutions (Oakley, 2005). However, as that SLAC would have a science lab in some form for teaching scientific reasoning in the general education curriculum and supporting majors in the sciences, it will have to comply with most of the same regulations as any collegiate lab, albeit at a smaller scale than the R1 university. Rather than having a staff of faculty members, scientists, post-doctoral researchers, graduate assistants, and undergraduate students on which to apportion compliance activities, such a lab may be staffed by a part-time employee and the teaching-focused professors who float through. (Olt, 2018, pp. 1-2)

After this, I elaborated on how this fell into a gap in the existing research literature and thus would have a positive benefit on the problem to be studied.

Preliminary Step 3: Purpose Statement

The purpose statement of a study is usually a single sentence that articulates why this study is being conducted, usually to address the research problem. It is generally expected to include the word "purpose," like, "The purpose of this study is to…" This is the first point in the four preliminary steps of the research process that the researcher actually becomes an active part of things. The previous two steps explain what has been and is; now, the researcher explains how they will help address the problem. The purpose statement may or may not be explicitly stated in a journal article-length manuscript, as it is often implied by the research question(s) or hypothesis(es). However, sometimes it is provided there in lieu of research question(s) or hypothesis(es).

Example Purpose Statement

I phrased the purpose of my dissertation study in this way:

> The purpose of this case study was to understand how regulatory compliance generated implicit costs of labor at a SLAC in the Midwest. (Olt, 2018, p. 3)

Preliminary Step 4: Research Question(s) & Hypotheses

Now at the most-specific preliminary step of this process, the topic has been refined to a problem statement, and that problem statement has then been refined to a purpose

statement. Now, specific research question(s) or hypthesis(es) are proposed, which are what this study will answer.

Research questions must be *carefully* worded. Of course, every word of scholarly writing must be precise, but research questions are held to an even higher standard. Differences between wording like using "what" or "why" will not only guide the substance of your research but also your methods/methodology.

Some important characteristics of a research question are that it is clear, precise, and only includes one item to be measured.

- *clear*. A reader of your research question should come away with no ambiguity about what you are researching. It should be succinct, which is a key component of clarity. Related to the next bullet point here, define any key words in the research question.
- *precise*. Every word is important. Consider the meaning of every word in the research question and make sure that is exactly what you are wanting to convey. If you are really trying to understand "why" something happens, do not casually use another adverb to introduce your question.
- *only includes one item to be measured*. Here is a non-example: "How does administrator feedback affect the emotional well-being and teaching performance of first-year teachers?" This is really asking about two different things (well-being and teaching performance), which should either be worded as two different research questions, whether done in tandem in one study or explored in two completely different studies.

Make sure to very explicitly define any key terms in your research question. For the words that are the substance of what is being measured, that definition needs to be very narrow and written in a way that it is measurable. For example, consider the following research question: "How do storylines [a pedagogical tool] affect the learning gains of secondary science students?" You would want to define the terms "storylines" (*probably immediately adjacent to your research question, as well as in a literature review section that includes a definition as well as the research that has been done this far on the tool*), "learning gains" (*likely both near your research question and then in the methodology, emphasizing the substance of what is being measured such as pre-/post-tests after a storylined unit as the experimental group*), and "secondary science students" (*probably briefly near your research question and then thoroughly in your methods section where you describe the participants by demographics including grade level and subject area*).

In certain quantitative methods (ex., experimental), it is common to either have (1) *both* research questions and hypotheses or (2) *just* hypotheses. An experimental study, for example, would normally have one more hypotheses, though it could also have research

questions. In studies where both research questions and hypotheses are present, an hypothesis is normally a statement of the expected findings of the research question, and often a null hypothesis is also stated (and is what will actually be tested). See the simplified illustration below.

- Research Question: Does Intervention A correlate to productivity?
- Hypothesis: Intervention A will positively correlate to productivity.
- Null Hypothesis: There is no correlation between Intervention A and productivity.

How many research questions does my study need?

It is common to wonder how many research questions one needs. The answer to the question is found in the question itself. How many research questions are *needed* to provide a coherent investigation the generates new knowledge about your topic? You should have exactly that many—no more, no less. Note that this is a subjective answer with no absolute number that is correct or not. For larger, generalizable quantitative studies, it is not uncommon to see anywhere from one to eight research questions. In a qualitative study, one research question is probably most common, but anywhere from one to three is not unexpected. A mixed methods study must have at least three research questions. And finally, action research most commonly only has one research question considered at a time (noting that that process is iterative and thus will consider other questions in later iterations researching the topic).

Example Research Question

The primary/central research question in my dissertation study (which was qualitative) was:

> How does regulatory compliance affect labor at a small liberal arts college? (Olt, 2018, p. 4)

Deciding How to Research Your Question(s)/Hypothesis(es)

Once a topic has been refined down to research questions and/or hypotheses, one must decide how they will answer them. The answer on *how* to research your topic is inside your research question. At the first level, you'll have to decide upon an over-arching approach to research. For examples:

- If you ask an historical research question, you would use historical methods, though those are humanistic rather than social science (ex., "How did John Dewey's conception of 'critical thinking' affect general education curricula in American higher education from 1900 – Present?").
- If you ask a research question about what an experience is like, you would likely engage in qualitative research, specifically phenomenology in this

example (ex., "What is it like for a member of Gen Z to get their first full-time job after college?").
- If you asked a research question about the effectiveness of an intervention, you would probably then conduct a quantitative study (ex., "How do storylines [a pedagogical tool] affect the learning gains of secondary science students?").
- If you asked three or more research questions, wherein at least one is qualitative, one quantitative, and one about the interplay between the two, you would conduct a mixed methods study. (ex., "To what extent does a nursing shortage exist in Iowa? How do members of the Iowa General Assembly perceive their role in addressing the nursing shortage in Iowa? How does funding from the Iowa General Assembly contribute to the nursing shortage in Iowa?")

The items above are, again, just examples, with many more options for each of the major approaches to social research. However, the "how" should really be derived from "what" exactly you are trying to ascertain. Often, the research questions can only lead to one approach, though that is not absolute.

Getting Approvals

In the United States (and almost every other country), organizations that conduct social science research are required to have an Institutional Review Board (IRB) or equivalent that evaluates the ethical implications of a proposed study. While only organizations receiving federal funding are technically required to have an IRB in the United States, it is a standard matter of practice wherever natural or social science research is conducted. Organizational/institutional IRBs will have different procedures for the application, and so researchers should consult their local IRB for appropriate procedures. Researchers should be aware that they may need *multiple* IRB approvals if they work at one organization with an IRB but conduct their research at others (or are a graduate student at one institution while working in another organization and researching there).

As part of the IRB approval process, social science researchers will commonly need to include a granting of general permission to conduct research at any sites (ex., a study about College X will need a general permission from an appropriate administrator at College X before proceeding) as well how individual consent/assent will be gained and documented.

Understanding Your Study's Limitations & Delimitations

One of the most confused aspects of study design, proposal, and write-up is that of limitations/delimitations. It is normal for a study to include a section or sections about

limitations/delimitations both in the initial proposal and in the Discussion or Conclusion section of the final write-up.

Limitations are factors that limit your study, *usually arising during the study and outside of researcher control*. In contrast, delimitations are factors that define the limits of your study, *which are inherent to the design and scope of the study.*

So, for example, consider the following statement:

> In this study, I gathered data in states in the southeastern United States.

That statement is a *delimitation*. It defines the boundary of your study, in this case geographically. That does not inherently mean the findings would have not applicability in, say, Vermont; however, they would not truly generalize there unless Vermont was included representatively in the population and sample of the study. There could be adequate cultural or structural differences between the southeast and northeast regions that the findings would not be reliable across both. However, delimitations in the final write-up of a journal article-type publication are relatively uncommon compared to the discussion of limitations, as researchers and editors often assume readers will just know delimitations as inherent characteristics of different methods/methodologies. Perhaps that is inadvisable and should be changed—especially in practitioner fields, but it is simply a reality at this point.

Now, consider another statement:

> While we had planned to get a profile of survey respondents that mirrored the school population, actual survey respondents were skewed with over-representation among white (race) and female (sex) students. Despite efforts to reach out to students from minority racial groups and males, we were unable to achieve representativeness.

That statement is an example of an actual *limitation*. Now, like the previous example, the researchers should not feel shame or failure. It is simply a statement of reality. They tried to get a representative population, but that simply did not happen. The researcher cannot ultimately control who participates, especially in a survey sent to an entire school's population. There could, however, be more added after this statement explaining that this lack of representativeness could skew the results and interpretation.

Key Takeaways

1. The most important facet of getting started is to get started. Whatever that means for your specific project—reading other papers, getting word vomit on the page (writing), etc.; make the conscious decision to take the first step.

2. From broad-to-specific, your preliminary steps of the research process should proceed as follows: topic → research problem → purpose statement → research question(s) / hypotheses.

Additional Open Resources

Chappell, K., & Voykhanksy, G. (2022). *Graduate research in education: Learning the research story through the story of a slow cat*. FHSU Digital Press. https://doi.org/10.58809/TUZF3819

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6

PRELIMINARY CONSIDERATIONS FOR QUANTITATIVE SOCIAL RESEARCH

Phillip Olt and Yaprak Dalat Ward

Definitions of Key Terms

- Causation: A relationship between variables, wherein one causes a change in another.
- Constructivism: The commitment that, whether objective truth exists or does not, it is only understood by humans as we construct it, which is driven by prior knowledge and social discourse.
- Correlation: A statistical relationship between variables, wherein they vary positively (*when one goes up, the other also goes up; or when one goes down, the other also goes town*) or negatively (*when one goes up, the other instead goes down; or when one goes down, the other goes up*).
- Experiment (true): A quantitative research design to test hypotheses, wherein (1) participants are assigned randomly but representatively to an experimental group and a control group, (2) all variables are tightly controlled, and (3) some treatment/intervention/experimental condition is implemented to compare data before/after.
- Hypothesis: An assumption to be tested that attempts to explain the relationship between certain variables.
- Null Hypothesis: An inverse of the hypothesis of a study wherein it is put forward that there is *no* relationship between the variables you are testing.
- Observational Study: A research design wherein the researchers do not manipulate or control

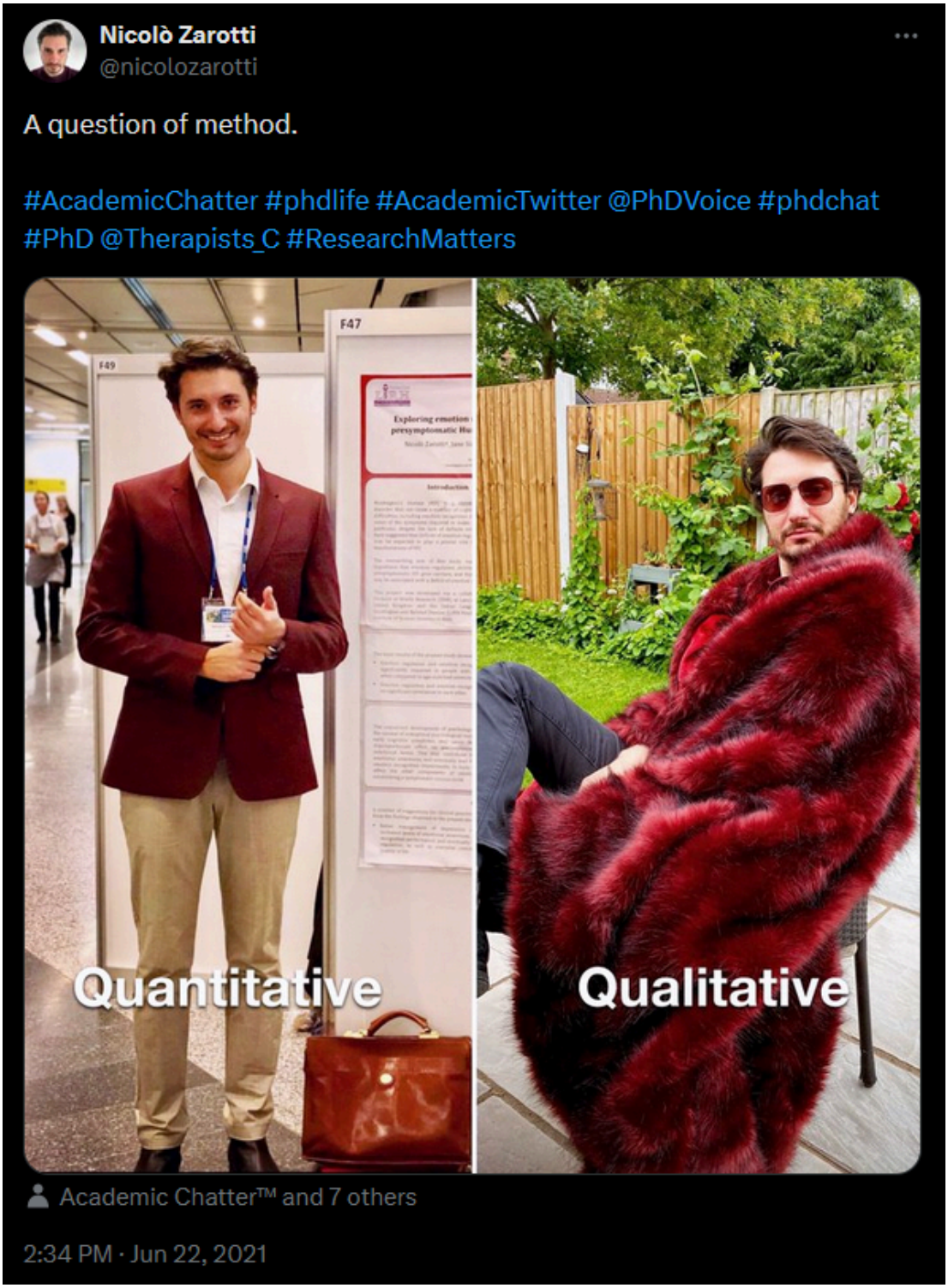
variables; rather, data is collected based on naturalistic observations of researchers and/or participants. One example of an observational study design is the survey.
- *p*-value: A measure of the statistical significance of findings, wherein it is the likelihood that the null hypothesis is correct and the actual hypothesis should be rejected.
- Population: Everyone within the group being studied.
- Positivism: The belief that objective truth exists and is knowable through (and only through) scientific methods.
- Post-Positivism: An extension of Positivism, holding that objective truth exists but is only knowable by humans in part and contingently.
- Quantitative: An approach to social science research that focuses on the collection of numerical data and/or numerical analysis of data to consider relationships among variables. Often, quantitative research has the goal of producing generalizable results by performing statistical analysis of a small representative sample of the population and implying those results upon the full population.
- Quasi Experiment: Like a true experiment but without full control of the variables, which can limit the power of its findings (*especially in the attempt to show cause-and-effect relationships*).
- Sample: A sub-set of the population that is used to study and then generalize those results onto the population.
- Spurious Correlation: This occurs when a statistical correlation is found, but no actual correlation exists.

What is "quantitative" research?

Quantitative social research is an approach to social science that focuses on the collection of numerical data and/or numerical analysis of data to consider relationships among variables. Types of quantitative social research include experimental, quasi-experimental, and observational studies (as well as secondary analysis of data from previous such studies). Each of those types of quantitative social research will be considered in a subsequent chapter. Ultimately, quantitative social research seeks to generalize findings from a sample onto a population.

Distinguishing Quantitative from Qualitative Social Research

As the saying goes, a picture is worth a thousand words. Indeed, Zarotti (2021) perhaps most effectively illustrated the difference between quantitative and qualitative research in the Tweet pictured below. On the left side, he is dressed sharply in a suit at an academic conference with the label "Quantitative;" on the right, he is dressed extravagantly in a maroon-dyed fur coat with designer sunglasses and labeled "Qualitative." The point being made there, somewhat cheekily, is that quantitative research has the reputation of classical academia—formalistic, clean, and respectable; meanwhile, qualitative research is the cooler and more fun uncle, perhaps looked down upon by their formalistic counterpart as not quite being good enough.



https://x.com/nicolozarotti/status/1407421760249765892

Presuppositions and Philosophical Commitments

The content of this section could—and maybe *should*—have been put in first chapter, as it is associated with the discussions on epistemology and ontology there. However, it is rather situated in the parallel introductory chapters to quantitative and qualitative research, as it is most applicable to understanding those methodological choices. Further, this content is severely over-simplified, and there are other approaches to these intellectual commitments that are not represented in this text; however, a certain level of detail that is both just enough and not-too-much is warranted in this level of text.

There are multiple aspects that come into play here, but there are really two and a half questions at the core:

1. Does objective truth exist? If so, is it knowable?
2. How do we know truth?

I often distinguish here between Truth ("big 'T' truth") and truth ("little 't' truth"), though that conception has evolved out of years of various readings and people. The first—Truth—considers there to be an objective truth to things, whereas the latter truth may or may not recognize the existence of an objective truth but concludes that truth is constructed by people (rather than existing independently of them). Let's first consider the question, "If a tree falls in the forest but no one was there to hear, did it make a noise?"A Truth person would argue that, yes, a noise (i.e., sound waves) logically would have to have been made, regardless of whether we have evidence of it. A crashing tree makes noises due to the physical interactions that produce them. However, a truth person might rather argue that either we do not know if it made a noise or that it did not produce a noise if no one was there to observe it.

Waning from the philosophical, we will move on to this more practical example:

> *There is an accident as two cars collide at an intersection that is not monitored by video surveillance. A police officer arrives, interviewing both drivers, any passengers, and nearby witnesses. Over the course of those interviews, they get various perspectives on what happened and who was at fault.*

In that example, is there an objective Truth of what happened (ex., that Driver A ran the red light, hitting Driver B's car)? The vast majority of people would agree "yes." Examples of alternatives to that would be (1) that none of that is real, as we live in a simulation, and (2) that one witness believes that Driver B was the one who actually ran the red light, thus having their own truth rather than an objective Truth. Then the question becomes, how would the officer find what that objective Truth is and how it came to be? Most commonly, people would answer that there will never be an *absolute* conclusion about what happened (for example, consider the "beyond a reasonable

doubt" and "preponderance of evidence" standards in the legal system); however, it is possible to come to a sound conclusion through thorough examination of the physical evidence (i.e., natural science) and careful analysis of the various participant/witness testimonies (i.e., social science). These things then might be triangulated and weighted to come to a conclusion of variable strength.

Within this text, we will consider three approaches to truth and if/how we know it: Positivism, Post-Positivism, and Constructivism. While those three are probably the most common in social science research, that is not to suggest their superiority or that there are not others (ex., Subjectivism). Of those, Positivism and Post-Positivism are most relevant to quantitative social research, and so they will be addressed in this chapter. The qualitative chapter will include some further discussion of Post-Positivism relative to that approach, as well as Constructivism.

Positivism

O'Leary (2004) defined positivism within the research context as, "the view that all true knowledge is scientific, and can be pursued by the scientific method" (p. 10). Essentially, objective Truth does exist, and it is knowable through a rigorous application of science. Anything not known through scientific methods is not accepted as Truth (but rather as belief).

Post-Positivism

As the name suggests, post-positivists have moved past some of what construes positivism, and yet it is still a form of positivism. O'Leary (2004) noted that post-positivists "believe that the world may not be 'knowable'. They see the world as infinitely complex and open to interpretation… science may help us to someday explain what we do not know, but there are many things that we have gotten wrong in the past and many things that we may never be able to understand in all their complexity" (p. 6). In practice then, post-positivists will generally recognize that Truth exists. However, knowledge of Truth is limited, and it is unknowable in an absolute sense. They prefer classic scientific methods (though not exclusively) to address social research questions, but they are more open to subjectivity, inductive reasoning, innovations in methodology, and multiple interpretations of reality.

Deductive Reasoning

Quantitative research generally replies upon deductive reasoning, which is often described as going from the large → small in scale. In other words, one starts from a general, accepted principle and draws a specific conclusion. For example:

- All humans need water to survive.
- Phillip is a human.
- Therefore, Phillip needs water to survive.

At some point in human history, a savvy person used this very logic to start selling bottled water. Because, if Phillip needs water to survive, he will likely want to acquire it in a safe and convenient way, which the individual-sized water bottle meets quite well. DeCarlo (n.d.) illustrated how this then translates to social science research, wherein a researcher: starts with a theory, develops an hypothesis, gathers/analyzes data, and then concludes whether or not the hypothesis is supported.

Strengths and Limitations of Quantitative Research

Strengths of Quantitative Research

One of the primary strengths of quantitative research is its reliability which means that by using standardized measurement tools and rigorous statistical analysis, quantitative studies produce consistent and objective data that can be replicated and verified by other researchers. Additionally, quantitative research enables generalizability, allowing researchers to draw broader conclusions and make predictions about populations beyond the sample studied. The reason for this is in quantitative research *large sample sizes* (minimum 30) are used. In fact, it is the large sample size which allows results to be applied to broader populations. Moreover, because statistical methods are used in analyzing data in quantitative research, bias is reduced resulting in objectivity of the findings. Another strength is precision due to using numerical data to provide exact numbers resulting in significant findings. Furthermore, because quantitative method facilitates hypothesis testing, identifies cause-and-effect, determines relationships, it contributes to the advancement of scientific knowledge in various disciplines.

Limitations of Quantitative Research

Despite its strengths, quantitative research also has limitations which researchers must consider. One notable weakness is its potential inability to capture the complexity and nuance of social phenomena as it relies on predetermined measurement tools and statistical procedures which may constrain a researcher's ability to explore unexpected variables or alternative explanations fully. In addition, as opposed to qualitative research, quantitative research in a way is restricted as it uses standardized methods. Therefore, it might not be a compatible tool for gaining a deeper understanding of all social research problems. Moreover, a statistical significance of "yes" or "no" does not always imply real-world importance. Quantitative studies may oversimplify multifaceted issues or overlook contextual factors that influence outcomes.

Furthermore, concerns about researcher bias and the reduction of human experiences to quantifiable data pose ethical and epistemological challenges in quantitative research. Given the aforementioned limitations, if researchers want to explore nuanced experiences, understand emotions, explore individual differences, identify perceptions, they may opt for qualitative research (Creswell & Guetterman, 2019).

Practical Considerations

To mitigate the limitations of quantitative research, researchers must pay careful attention to research design, data collection, and analysis procedures. This includes selecting appropriate variables, sampling methods, and statistical techniques tailored to responding to the research question and objectives. Ensuring the validity and reliability of data through rigorous measurement and statistical analysis is crucial for producing credible findings. Furthermore, as in qualitative research, researchers must adhere to ethical principles (see also Chapter 2), such as obtaining informed consent, protecting participant confidentiality, and transparently reporting research findings to uphold the integrity of quantitative research.

A Healthy Dose of Skepticism

> "There are three kinds of lies: lies, damned lies, and statistics." ~Benjamin Disraeli (alleged) per Mark Twain

In this chapter on quantitative research and then the later parallel chapter on qualitative research, you will find a section encouraging you to be skeptical of published research. This skepticism should extend to multiple and mixed methods, as well as really any other research you read. Skepticism is a foundational principle of science, and so as consumers of social science research, it is essential that we read all of it as a critic and a skeptic.

Specific to quantitative research, here are some of the major concerns:

- Data integrity & authenticity
- *p*-hacking and manipulative analysis
- Reproducibility crisis
- Misunderstanding, misuse, and misinterpretation
    - Confusing correlation and causation
    - Spurious correlations

Data Integrity and Authenticity

Common across all research, there is great and growing concern about whether the data being used are real and/or accurate. There is immense pressure placed upon authors

within academia to publish a *lot and* in top-tier journals (known as "publish or perish"). Thus, academic researchers have significant incentives to do their research quickly and come up with sensational findings that journal editors would be more likely to publish as impactful. One (unethical) way to do that is to utilize fake data. The researcher could do this manually by creating data, whether through repeatedly submitting survey forms themselves or just modifying aggregated results, that conform to accepted theories and will thus be likely published. The researcher also could use an AI bot or exploitative, underpaid labor in "click farms" to rapidly create significant amounts of data.

In the 2020s, there has been a push to increase data transparency by sharing raw data with the subsequent publication; however, that is easily subverted by actually generating the fake data. In cases where aggregated data are tinkered with, it is possible that full data sets could be analyzed by reviewers and/or readers to find those inconsistencies. But in terms of generating totally fake data, there really is no way to check.

Everything could be fake, and there is no way to *know*. Now, it is almost certainly not true that *everything* being published these days is fake, but it is certain (as evidenced by Retraction Watch, 2024: https://retractionwatch.com/) that at least some are. That said, some retractions may well be bogus themselves (ex., Ferguson, 2024).

p-hacking and Manipulative Analysis

p (or, *p*-value) is the statistical probability of the null hypothesis being true. So, if $p = 0.049$ (with 0.05 being the most common standard for significance and thus publication), then we are saying there is 95.1% confidence in there being an actual relationship between the two variables. *p*-hacking then is "a compound of strategies targeted at rendering non-significant hypothesis testing results significant" (Stefan & Schönbrodt, 2023, p. 1). FiveThirtyEight (n.d.) provides an excellent tool to practically understand *p*-hacking: https://projects.fivethirtyeight.com/p-hacking/. By selectively messing with specific variables within a large data set and then making broad inferences, one can come up with highly significant correlations quickly; however, do those correlations actually represent Truth (or even truth)? Likely not, and using the tool is somewhat of a crash course on how to lie with statistics.

Reproducibility Crisis

John Ioannidis, a medical science professor at Stanford University, is perhaps the father of the reproducibility crisis, though in the sense of uncovering it rather than causing it. Ioannidis (2005) published his bombshell paper, "Why Most Published Research Findings are False," which became quite controversial among those who conduct human-subjects research (whether natural or social scientific research). He exposed

how biases in the research community, an over-reliance of quantitative formulae, increasingly niche research and researchers, and similar factors have contributed to the increasing likelihood that most research findings are just confirming what was being sought rather than discovering what was actually True.

The concerns rapidly accelerated to a "crisis." Brian Nosek, a psychology professor at the University of Virginia, then founded the Center for Open Science in 2013. Concerned about whether quantitative psychological studies were truly reliable as they claimed, he embarked on a journey that exposed a key flaw in quantitative social research. Unfortunately, whether a study is published in a top journal, whether the author is a world renowned expert, or most other variables, the Center for Open Science's (2024) Reproducibility Project has yielded extremely disappointing results, specifically in psychology but now many other fields as well. Their work boils down to replicating the methods of published studies and seeing if the results are consistent with the original study's results. While the original studies report being statistically reliable, those statistical projections of reliability have generally not held up. A great number of "reliable" findings subjected to re-testing have turned out to not be reliable. If a study is not reliable, then the findings and conclusions are of little to no use (or at least must be interpreted with the same degree of caution as qualitative studies). Given that all or almost all of our recent generalized knowledge comes from such studies, finding that many (potentially upward of 70%) are meaningless is concerning, at the least. Whether the lack of repeatable results is due to researcher misconduct (i.e., lying), poor methods, the inherent unpredictability of human behavior, or something else, we simply do not know beyond a few of those studies.

The reproducibility crisis, dating to the early-2000s, seems substantive and unlikely to go away soon, bringing into question whether we should trust quantitative social science or really generalize any specific study beyond its original context.

Misunderstanding, Misuse, and Misinterpretation

What do these numbers and symbols even mean?! Many practitioners (and researchers, if we're being honest) crack open a new study that's supposedly groundbreaking, only to be confronted with massive data tables that mean little-to-nothing. What good is social work research if social workers can't read and interpret it? What good is management research if managers can't make sense of what they're reading? This hidden problem is that quantitative research is often so precise and technical that it becomes opaque to the end users of the findings. While there is some value to other researchers or those practitioners who can understand what they are reading, much of the value of research in a practitioner field is lost when practitioners cannot read and interpret it. Providing more interpretive instructions (ex., what each symbol means and then what that actually

represents) might seem irrelevant to researchers who live in the data, but it could have great value to practitioners reading their papers—or even encourage more practitioner reading of and engagement with scholarly research in their area.

Beyond just practitioner engagement, many studies' findings are simply misunderstood. That might mean inferring a cause-effect relationship when only a correlation has been found. That might mean exaggerating statistical findings in the media. But however and wherever it occurs, the misunderstanding, misuse, and misunderstanding of statistical data is very common and problematic.

Confusing Correlation and Causation

Correlation and causation… These two terms are dangerous when conflated, but yet they *are* commonly confused, even among those who know the distinct definitions.

First, let's establish the terms' definitions:

- Correlation: a statistical relationship between variables, wherein they vary positively (*when one goes up, the other also goes up; or when one goes down, the other also goes town*) or negatively (*when one goes up, the other instead goes down; or when one goes down, the other goes up*).
- Causation: a relationship between variables, wherein one causes a change in another.

Second, we also need to establish two important truths:

1. Correlation is not equal to causation.
2. Correlation does not imply causation. (Note: It is very easy to see a relationship demonstrated and infer cause-and-effect without consciously even thinking about it.)

Correlations are usually talked about as either a positive correlation (where two variables behave similarly) or a negative correlation (where two variables behave in opposite fashion). As discussed in the sub-section below on spurious correlations, a *statistical* relationship between variables does not always mean an *actual* relationship between the variables exists. Within a correlation, it is possible that Variable A causes the change in Variable B, Variable B causes the change in Variable A, or that neither variable causes the changes. Statistical correlations are relatively easy to demonstrate, and so they are very common outcomes of quantitative social science research.

However, causation (also known as, cause-and-effect) is a *much* higher bar for the outcome of a quantitative social science research project.

In the natural sciences, this would be accomplished through a tightly controlled setting

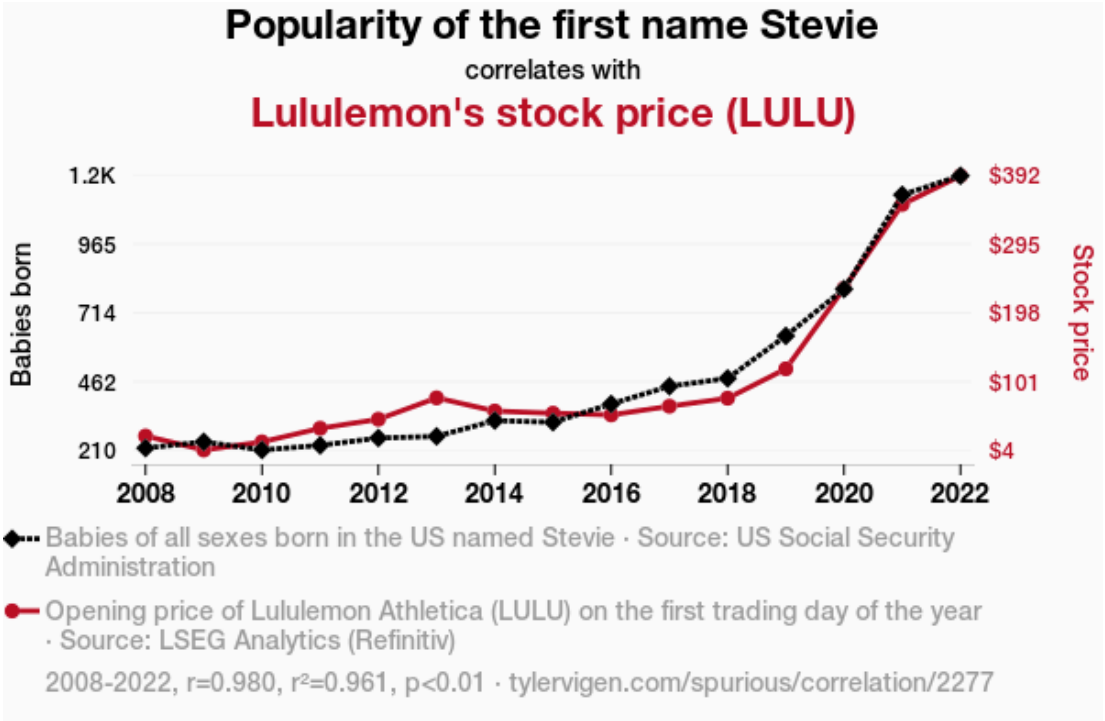
such that *only* one independent variable exists at a time. For example, think of a sealed test tube filled with Liquid A that is blue. The color remains blue inside the sealed tube at room temperature for a full day. Then, it is placed over a lit Bunsen burner, which dramatically increases the temperature of Liquid A. Liquid A immediately goes from blue to clear. We then repeat this experiment identically numerous times, getting the same result. We could then conclude that the temperature increase caused the change in color.

Causation is, however, much harder to identify and prove in social research, as variables are much more difficult to control. The random assignment of participants may be very difficult or even unethical. Other variables might be introduced into the observational study, which affect the outcomes. As such, causation in social research is rarely demonstrated. While causation normally comes from true experiments, there are, however, methods for observational studies to demonstrate causation in social research. That content exceeds the scope of this text. Others have more thorough explanations, which should be consulted as further reading (exs., Mauldin, 2020; Stafford & Mears, 2015).

Spurious Correlations

One specific type of misunderstanding is interpreting an *actual* relationship any time two variables are *statistically* correlated. With most quantitative social science research being correlational in nature, it is easy for a novice researcher to assume that a statistical correlation means that there is, in fact, a relationship between two variables. However, that is misleading. A statistical correlation *suggests* a relationship, but it is up to the researcher's interpretation skills to determine if such a relationship exists. For a supposedly objective process, that can be a quite subjective keystone.

Spurious correlations occur when a statistical correlation is found, but no actual correlation exists. If one compares enough data, a huge number of spurious correlations will inevitably be found. For example, consider the example below (Vigen, 2024):



Used by permission. CC-BY.

Obviously, that is a somewhat ridiculous relationship to infer. However, even when two variables are assumed to be related by a researcher and then a statistical correlation is found, a small portion will be spurious (i.e., a false positive). Given the number of published correlational studies published in a year, however, it is concerning with the number that are actually just reporting spurious correlations that were coincidentally correlated (again, see Retraction Watch, 2024).

Key Takeaways

1. Quantitative research emphasizes the breadth of generalizability rather than the depth of understanding.
2. Quantitative research is done through experimental, quasi-experimental, and observational studies.
3. Quantitative research emphasizes adherence to natural science ideals, objectivity, rigor, and consistency.
4. Neither quantitative research nor its researchers are perfect. It is the responsibility of the readers of quantitative research to carefully evaluate the research and consider its generalizability to their context.

Additional Open Resources

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#AcademicTwitter @PhDVoice #phdchat #PhD @Therapists_C #ResearchMatters [Image attached][Post]. X. https://x.com/nicolozarotti/status/1407421760249765892

7

TYPES OF QUANTITATIVE RESEARCH

Yaprak Dalat Ward

Definitions of Key Terms

- Causation: A relationship between variables, wherein one causes a change in another.
- Correlation: A statistical relationship between variables, wherein they vary positively (when one goes up, the other also goes up; or when one goes down, the other also goes town) or negatively (when one goes up, the other instead goes down; or when one goes down, the other goes up).
- Correlational Design: A quantitative research design that examines relationships between variables but does not imply causation.
- Data: The plural form of the singular "datum;" Leedy and Ormrod (2005) defined data as the manifestations of what reality is. In quantitative research, numerical data are collected, but data can take many other forms.
- Descriptive Design: A quantitative research design that describes trends and characteristics (e.g., surveys, observational studies) in terms of descriptive statistics
- Descriptive Statistics: Simple measures that describe a variable, such as mean, median, mode, standard deviation, variance.
- Experimental Design: A quantitative research design to test hypotheses, wherein (1) participants are assigned randomly but representatively to an experimental group and a control group, (2) all variables are tightly controlled, and (3) some treatment/intervention/experimental condition is implemented to compare data before/after.
- Hypothesis: An assumption to be tested that attempts to explain the relationship between

certain variables.

- Inferential Statistics: Statistical analyses that attempt to demonstrate relationships among variables, such as t-tests, ANOVA, chi-square tests, and regression analysis.
- Instrument(s): Tools which are used to collect data, such as surveys.
- Null Hypothesis: An inverse of the hypothesis of a study wherein it is put forward that there is no relationship between the variables you are testing.
- Pilot: When selecting an instrument, such as a survey, it needs to be tested with a small group to determine its reliability and validity.
- Prediction: Following a correlational research, researchers can make predictions (forecasting) related to the correlational research outcome.
- *p*-value: A measure of the statistical significance of findings, wherein it is the likelihood that the null hypothesis is correct and the actual hypothesis should be rejected.
- Quasi-Experimental Design: Like a true experiment but without full control of the variables, which can limit the power of its findings (*especially in the attempt to show cause-and-effect relationships*).
- Reliability: Ensures consistent results across repeated trials.
- Research: A systematic approach to generating new knowledge situated within the body of knowledge for an area of study.
- Sample: A group that is selected (randomly, purposefully, conveniently, etc.,) from a population. The population is a large group of things that have a common trait (ex., living in the United States), and a sample is a smaller group selected from the population.
- Statistical Significance: When numerical data are analyzed, in general the findings should be indicated as "statistically significant"
- Validity: Ensures the study measures what it intends to
- Variable: A thing which varies and can be measured in quantitative research. Variables can be grouped as 1) an independent variable (which is manipulated) and 2) a dependent variable (which gets measured).

Quantitative research is a systematic investigation that relies on numerical data to understand patterns, relationships, and causes within educational settings. In education and the social sciences, it is commonly used to measure topics spanning from student achievement, management strategies, and evaluation of program effectiveness.

Quantitative research involves the collection and analysis of numerical data to uncover patterns, relationships, and trends. It employs structured methodologies and statistical techniques to quantify observations and test hypotheses. Unlike qualitative research, which focuses on understanding subjective experiences (*verstehen*) and perspectives (Creswell, 2015), quantitative research aims to produce objective, replicable findings based on quantifiable measures. However, to navigate the complexities of quantitative research, a critical and reflective approach is essential for addressing challenges and maximizing the impact of research endeavors. To do so, let us first understand the strengths and weaknesses of quantitative research and incorporate essential considerations into research practices. By doing so, you can conduct rigorous and

meaningful quantitative research that contributes to your scholarly discourse and real-world applications.

Why Use Quantitative Research?

Quantitative research is not only about numbers. It is what these numbers reveal as they help uncover patterns, test theories, and enable to make predictions with precision and objectivity.

First, a powerful characteristic of this method when conducted properly, is its predictive power which helps us forecast trends, such as how student engagement impacts academic performance or how leadership styles influence institutional success. In addition, having entered into a new era, we continue to experience the rise of large-scale quantitative analysis, machine learning, and AI-driven analytics. These challenging and inspirational opportunities make quantitative research even more powerful. Moreover, as discussed in the previous chapter, quantitative research allows for controlled environments (experimental control), enabling us to isolate variables and test causality. Furthermore, one of its greatest power is that well-designed quantitative studies can be repeated and verified, making findings more robust over time.

Given its aforementioned powerful characteristics, you may prefer to use the quantitative method in your research if 1) you need measurable, generalizable insights, that is, if you are looking to understand trends across large populations (e.g., how international students adapt to online learning); 2) you prefer objectivity and comparability – when testing hypotheses with minimal bias, such as evaluating different teaching methods based on student outcomes; 3) your goal is to establish causation by means of experimental and quasi-experimental designs, helping you determine if one variable directly influences another; and 4) you require statistical evidence for prediction and decision-making since policy makers and administrators often rely on quantitative data to guide resource allocation and institutional improvements.

As discussed in Chapter 6, yes, the quantitative method is often viewed as the golden standard for reliability, because it reduces variability (large sample sizes allow broader generalization) and offers data-driven decision making (reduces subjective interpretation). However, it is fundamental to keep in mind that numbers alone may not explain *why* a phenomenon happens. As noted in the upcoming chapter, Chapter 8, poorly designed surveys or biased datasets can distort findings. Furthermore, just because something is *statistically* significant does not mean it has *practical* significance.

In sum, quantitative research is powerful, but it is not a one-size-fits-all solution. This method is most reliable when properly designed and interpreted with context. In a situation when numbers and their interpretations alone do not give us the whole picture

of the phenomenon, we want to dig deeper and explore the why of the phenomenon. That is when we need to complement our research by adding qualitative insights. In this case, the mixed method (blended) research (Tashakkori & Teddlie, 2010) would be our best option, which is fully explained in Chapter 12.

Common Quantitative Research Designs

As in qualitative research, quantitative research method also includes different designs, dependent on the purpose of the research. In this section, we will only cover a few of the common designs to give you an introduction. The goal of these designs is to describe patterns, explain attitudes, determine relationships, and to look into effects. Below are the descriptions of the commonly used designs with examples. The critical aspect of these designs is the language, which is usage certain word choices.

Descriptive Research Design

Descriptive research describes characteristics of a population or phenomenon without manipulating the variables. This design focuses on summarizing data and identifying patterns or trends. In a descriptive study, data can be collected by means of a rating scale (*Likert Scale*) which would yield numerical data. But what is a Likert scale? The scale was developed by Rensis Likert (1932) who was an American social and organizational psychologist, and is considered a rating scale (5-7 point ordinal scale) with range of answers such as "strongly agree," "agree," "neutral," "disagree," and "strongly disagree," allowing respondents to indicate their level of agreement/disagreement regarding statements on attitudes, approaches, trends (Roy, 2020). An example would be to describe the sleeping habits of high school students. Your survey results would yield the description of sleeping habits.

Descriptive Research Design Example

> The purpose of this research is describe the sleeping habits of high school students. First, to measure the sleeping habits, we need to have a sample (large) selected from a population of high school students. Then, we need to develop an instrument to do the measuring—in this case it will be a survey (Likert Scale). The survey would include statements regarding sleeping habits. The responses students would be expected to mark would vary from "strongly agree," "agree," "neutral," "disagree," and "strongly disagree." Important note, if we develop the survey, we would need to first, *pilot* it, that is test it to determine the reliability and validity of the survey on a small group of students. Once we know that the survey questions will inquire what it is supposed to inquire (validity) and our measurement will be consistent over time (reliability—if we give the survey again,

the survey would yield the same numbers), we can go ahead and distribute the survey to collect data. But how do we collect data? First, in this case, we can randomly select a group of 500 students (a large sample) from X High School and distribute the survey. The responses students would mark would vary from "strongly agree," "agree," "neutral," "disagree," to "strongly disagree." With this approach, data analysis will yield percentages, numbers of attitudes on their sleep habits which is what we want.

Correlational Research Design

Correlational research examines the relationship between two or more variables to determine whether changes in one variable are associated with changes in another variable. Correlation does not imply causation but helps identify potential relationships for further investigation. With this design we need to pay attention to two factors: 1) determine the direction of the relationship (positive or a negative), and 2) determine the strength of the relationship (significantly strong or weak). If there is no significant strength (zero), there is no relationship to mention. An example would be quality sleep and academic success. Based on these two variables, our central research question would be: Is there a significant relationship between quality sleep and academic achievement? Here is another aspect regarding our central question—if we are almost 100 percent sure—meaning we have a strong hunch about this relationship, instead of developing a central research question, we can opt for a *hypothesis*, in this case, an *alternative hypothesis*. Another hypothesis to mention is *null hypothesis* but in this situation due to our strong hunch, we select the *Alternative Hypothesis: There is a significant relationship between quality sleep and academic achievement.* If there is no significant strength, there is no relationship to mention. To determine the relationship a statistical test such as *Pearson Product Coefficient* will be used.

Correlational Research Design Example

The purpose of this research is to explain the relationship between academic achievement and quality sleep. Once we define "quality sleep" and "academic achievement," we need to develop or identify an inventory regarding quality sleep. What is "quality sleep" and how many hours is required to get quality sleep? Remember the inventory or test needs to have a high reliability and validity score. If we can identify an inventory which has been successfully used by other researchers, we can easily use that inventory. For the "academic achievement, "we can easily refer to the students' official academic records. In a correlational design, we would need to determine 1) the direction of the relationship and 2) the strength of the relationship. In addition, assuming we find a significant relationship (in this case-positive) between the two variables, we can also use

these findings and make predictions by conducting a *Regression Analysis*. But we will not cover *Regression Analysis* in this course. You just need to know that a significant relationship can help us make predictions. So, based on our findings, we can predict that "a student who gets quality sleep will likely be academically successful."

Experimental Research Design

Experimental research involves manipulating one or more independent variables to observe their effects on the dependent variable(s) while controlling extraneous variables and measuring the outcome. It allows researchers to establish cause-and-effect through random assignment of control groups. According to Creswell (2015), "a 'true' experiment involves random assignment of participants, groups, or units. This form of experiment is the most rigorous" (p. 328). Experimental research design may involve one or more than one group of participants. If multiple, the groups would need to be similar in characteristics or attributes.

Experimental Research Design Example

The purpose of this research is to determine the effect of the "flipped classroom technique" on student learning. You want to know if student learn better under the traditional method or under the new method (flipped classroom technique). You can do this in two ways: 1) First, you can identify a school and matching participants or homogeneous samples and randomly assign them to two groups. One group will be your *control group* and will be taught by the traditional method without any manipulations. You can determine the effect by a test. The second group will be your *experimental group* and will be taught by the new method. What you want to do is determine the effects of this method on their learning by assessment again. Based on the two methods and two assessment outcomes, you can use a statistical test (*t-test*) and reach a decision by answering the following questions: Is there a difference in their learning? Is the difference significant? YUour findings will indicate the difference as a significant yes or a significant no.

You could also do this as a pre-experiment with one group. First, you would measure the effects on learning by assessing the students (pre-) prior to the experiment. Then, you can manipulate the method by using the flipped classroom technique and determine the effects on learning again by assessing the students (post). Once you have two outcomes, by looking into the differences, you can determine the significance of the effect.

Quasi-Experimental Research Design

Quasi-experimental research resembles experimental research but lacks random assignment to treatment conditions. Instead, researchers use pre-existing groups or natural variations to study the effects of interventions or treatments. An example would be studying the impact of a new curriculum in one school while using another as a comparison group. In quasi experimental design, you would be using an existing classroom teaching the traditional method and flipped classroom technique. Because your participants would not be randomly selected, your experiment will become quasi experimental, and you may experience threats to your research such certainty.

Longitudinal Research Design

Longitudinal research follows participants over an extended period to study changes or developments in variables over time. It allows researchers to examine patterns of stability, change, and continuity in individuals or groups.

Survey Research Design

Survey research involves collecting data through surveys or interviews (not to be confused with qualitative interviews) to gather numerical data on attitudes, opinions, behaviors, or characteristics of individuals or groups. Selected participants are given a survey based on a scale (Likert scale) to describe their thoughts on trends, etc. The difference between experimental design is that survey design does not involve a treatment (Creswell, 2015). You can use a survey design, for an example, to find out about the trends of social media users among high school students.

Plan to Conduct a Rigorous and Successful Quantitative Study

There are several critical considerations to ensure a rigorous and successful study. Following is a comprehensive list of factors to consider:

1. Significance of our Research Problem (What is a significant problem?)

First, prior to starting our research, we must define a problem which is worth investigating. This is also referred to as the "so what" effect of the research which applies to all research projects. So, how do we identify a research problem? Think about the problems you observe or have to tackle at your schools, classrooms, districts, communities, workplaces! Remember these "problems" need to have to be significant meaning they need to be justified. To justify our research, here is how our thought process works (Mills & Gay, 2019). As short-term thoughts appear and cues bubble up

as research problems, according to Weick (1995): "our sensemaking perspective is in operation" (p. 2). These bubbles help us shape those problems we identify. We think about the factual aspect and significance (Is it worthwhile to research this problem? What makes it significant?). Once we identify a significant problem, we can move forward to reviewing past research.

So here is how it works—we need to ask ourselves why this research problem is worth investigating—hence, the significance of research. For an example, in this example I want to determine if there is a relationship between quality sleep and job performance. My two variables would be *quality sleep* and *job performance*. But which is an independent variable and which is a dependent variable? In terms of identifying independent and dependent variables, we need to determine which variable affects the other variable(s), that is—which is manipulated and which is measured. Since quality sleep differs and can be manipulated, it is my independent variable. Now, we need to study and operationalize them into measurable and observable constructs.

2. Review of Literature (What previous similar research has been conducted?)

Second, once we have a research problem defined, we should not immediately start conducting research. We need to investigate past research to determine if this particular problem had been investigated. Here are some questions to consider: 1) Why is it critical to give past researchers credit by recognizing their work. 2) Do we want to continue in their footsteps? 3) Do we want to branch off and look into another aspect of their research problem? Once we gather publications on our research problem, or any research that is similar to my research question, we need to make notes on the data collections, findings and implications of those research projects. If we are unable to determine any grounded research on this problem, we can conclude that there is a gap in the literature and be the first to look into this particular research problem.

3. Identify Your Purpose with (a) Central Research Question(s) (What is the purpose of your research plan and what do you want to find out?)

Third, once the literature is scanned, past research is recognized, we need to determine how we want to conduct our research. We need to set a goal, which is identify a purpose, meaning what it is that we want to find out. When building a purpose statement, there is a formula, a certain language that we need. We can't just come up and say, I want to find out about this problem x. Here is how it works: In quantitative research we describe patterns, explain relationships, and look into trends. Unlike qualitative research, we do not explore phenomena. When building purpose statements, we use action verbs such as "describe," "explain," "look into," "compare," determine a relationship,"

These action verbs tell us to either test an idea, compare groups, explain the relationship among variables, describe attitudes, opinions, etc. Our samples are large (minimum 30 people—the larger our sample, the more significant our findings are), and we collect numerical data (meaning—numbers using instruments like surveys, etc.). The purpose is to get a significant yes or no.

Once a purpose statement is described, you need (a) central question(s). Examples of research questions start with question words including "how," "what," or "why" because we want to describe, compare, or relate (Creswell and Guetterman, 2019). You can also set up a hypothesis (*null hypothesis* or *alternative hypothesis*) if you have a strong hunch what you expect to find, ensuring it is specific, measurable, and relevant to your field of study (Creighton, 2001; Sheperis, et al., 2010).

4. Research Design (What quantitative design is appropriate for your research plan?)

Once you know the purpose of your research, selecting an appropriate research method and design that aligns with your research question and objectives becomes easier. Since we are tackling quantitative research, while there are many quantitative research designs, common research ones in quantitative research include experimental (such as causal comparative) design, quasi-experimental design, correlational design, survey design, and observational designs.

Example of how to get started:

Let's assume that we want to find out if there is a *significant relationship* between quality sleep and job performance. The two variables to consider include *quality sleep* and *job performance*. How do I go about selecting my quantitative research design? Since I intend to look into relationships, I would select the correlational design. Why? Because correlational design looks into relationships from two aspects, one aspect is the directions of the relationship (positive or negative) and the other aspect is the strength of the relationship (strong or weak). My research questions would be: Is there a significant relationship between quality sleep and job performance? Now if I have a strong hunch that quality sleep affects academic achievement in a positive way, I can set up a hypothesis: There is a significant relationship between quality sleep and job performance. If I am not to sure, I would stick with my initial question: Is there a significant relationship between quality sleep and job performance?

5. Data Collection (Who or what is your population and how will you collect data?)

The most fundamental step in data collection is to get consent from the institution and population you identify. Your data collection method depends on the nature of your purpose, research question and research design. What population are you interested in?

What will your sample size be? Do you need consent/assent letters? How will you collect data? Will you collect data by means of surveys, experiments, observations, or secondary data analysis?

Population/Sample (How many participants do you need?)

Once we know what design, what central question(s), we need to determine our sampling strategy and sample size based on the population of interest, ensuring it is representative and adequately powered to detect the effects of interest. Quantitative sample numbers are large compared to qualitative sample numbers. While in qualitative research, you can select one or two participants, in quantitative research, your sample needs to be large (minimum 30) to be significant. The larger the sample, the more reliable the findings are. But how do you go about selecting your sample from the population of interest? Here are a few common ways to do it: 1) select your sample based on a purpose (purposeful sampling); 2) select your sample based on convenience (convenient sampling); 3) select your sample randomly (randomized sampling). There are many more sampling methods but we just need to know the common ones at this point.

Let us use the variables we used before—we are interested in quality sleep and job performance in a large company. In this particular company, there are 7,342 employees (population). Based on our research plan, we need to do two things: 1) determine our sample size; and 2) method to select (sampling) our participants (sample) whether purposeful, random, or convenience sampling.

Once we collect our data, we need to decipher these data to make sense, which is all about our findings.

Note: Steps 6 (Data Analysis) and 7 (Reporting) to this process of conducting a quantitative research study are located in the next chapter.

Key Takeaways

1. Quantitative approaches to research have the most historical and classical grounding in social/behavioral research.
2. Various quantitative research designs may be used but will give variable levels of confidence in results and ability to infer types of relationships between variables.

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8

QUANTITATIVE DATA ANALYSIS

Yaprak Dalat Ward

Definitions of Key Terms

- Causation: A relationship between variables, wherein one causes a change in another.
- Correlation: A statistical relationship between variables, wherein they vary positively (when one goes up, the other also goes up; or when one goes down, the other also goes town) or negatively (when one goes up, the other instead goes down; or when one goes down, the other goes up).
- Correlational Design: A quantitative research design that examines relationships between variables but does not imply causation.
- Data: The plural form of the singular "datum;" Leedy and Ormrod (2005) defined data as the manifestations of what reality is. In quantitative research, numerical data are collected, but data can take many other forms.
- Descriptive Design: A quantitative research design that describes trends and characteristics (e.g., surveys, observational studies) in terms of descriptive statistics
- Descriptive Statistics: Simple measures that describe a variable, such as mean, median, mode, standard deviation, variance.
- Experimental Design: A quantitative research design to test hypotheses, wherein (1) participants are assigned randomly but representatively to an experimental group and a control group, (2) all variables are tightly controlled, and (3) some treatment/intervention/experimental condition is implemented to compare data before/after.
- Hypothesis: An assumption to be tested that attempts to explain the relationship between certain variables.
- Inferential Statistics: Statistical analyses that attempt to demonstrate relationships among

variables, such as t-tests, ANOVA, chi-square tests, and regression analysis.
- Instrument(s): Tools which are used to collect data, such as surveys.
- Null Hypothesis: An inverse of the hypothesis of a study wherein it is put forward that there is no relationship between the variables you are testing.
- Pilot: When selecting an instrument, such as a survey, it needs to be tested with a small group to determine its reliability and validity.
- Prediction: Following a correlational research, researchers can make predictions (forecasting) related to the correlational research outcome.
- *p*-value: A measure of the statistical significance of findings, wherein it is the likelihood that the null hypothesis is correct and the actual hypothesis should be rejected.
- Quasi-Experimental Design: Like a true experiment but without full control of the variables, which can limit the power of its findings (*especially in the attempt to show cause-and-effect relationships*).
- Reliability: Ensures consistent results across repeated trials.
- Sample: A group that is selected (randomly, purposefully, conveniently, etc.,) from a population. The population is a large group of things that have a common trait (ex., living in the United States), and a sample is a smaller group selected from the population.
- Statistical Significance: When numerical data are analyzed, in general the findings should be indicated as "statistically significant"
- Validity: Ensures the study measures what it intends to
- Variable: A thing which varies and can be measured in quantitative research. Variables can be grouped as 1) an independent variable (which is manipulated) and 2) a dependent variable (which gets measured).

Plan to Conduct a Rigorous and Successful Quantitative Study (continued)

Note: Steps 1-5 are located in the previous chapter.

6. Data Analysis

This step is about developing a comprehensive data analysis plan outlining the statistical techniques and procedures you will use to analyze your data / test your hypotheses. Once we collect our numerical data, here is what we need to do.

- **Data Description:** At a first glance, prior to our analysis, we need to describe and summarize our data. During this stage statistics plays a crucial role. This first form of statistics, descriptive statistics includes measures of central tendency (mean, median, mode) and measures of variability (range, variance, standard deviation), providing researchers with a clear understanding of the characteristics and distribution of their data. By organizing and presenting data effectively, statistics can help researchers identify patterns, trends, and outliers, laying the foundation for further analysis.

- **Data Analysis:** Second, quantitative research often involves analyzing numerical data to test hypotheses, identify relationships, and make predictions. Statistical analysis techniques, such as inferential statistics, enable researchers to draw conclusions about populations based on sample data (Cohen & Swerdlik, 2002). By applying probability theory and hypothesis testing methods, we can determine the likelihood of observed differences (experimental design) or relationships (correlational design) being reflective of true population parameters. Common statistical tests include *t-tests*, *analysis of variance (ANOVA)*, *correlation coefficient*, *regression analysis, and chi-square tests, among others.*

Remember quantitative data analysis will yield a significant "yes" or a significant "no." There is no deeper understanding, like in qualitative research.

Using Software to Analyze Quantitative Data

When we decide which statistical test to use, there are two primary software programs used for calculations: SPSS or R Guide. We can import our numerical data, tell the program what to do (compare, correlate, describe, etc.,) and we will obtain the results in seconds. It is, however, up to us to interpret the findings (depending on the value you get—significant or not).

- **Secondary Data Analysis:** Just a few words on secondary data analysis. What does this entail? Secondary data analysis involves analyzing existing datasets collected by other researchers or organizations for purposes other than the original research question, as opposed to our own collection of new data to analyze. It allows researchers to leverage existing data to address new research questions or replicate previous findings.
    - **Example of Secondary Data Analysis:** A researcher is interested in studying the effects of socioeconomic status on educational attainment. Instead of collecting new data, they decide to use existing survey data from a national education database that includes information on students' socioeconomic backgrounds and academic achievement.
- **Existing Websites for Datasets:**
    - The U.S. Census Bureau: The U.S. Census Bureau provides a wide range of demographic, economic, and social datasets collected through national surveys and censuses. Researchers can access data on population characteristics, household income, education, employment, and more.
    - The World Bank: The World Bank offers datasets on global development indicators, including poverty, health, education, gender

equality, and environmental sustainability. Researchers can access data from various countries and regions to conduct cross-national analyses.
    - The Inter-university Consortium for Political and Social Research (ICPSR): ICPSR is an international consortium that provides access to a vast archive of social science datasets. Researchers can find datasets on topics such as sociology, political science, economics, psychology, and public health.
    - Kaggle Datasets: Kaggle is a platform for data science competitions and collaboration where researchers and data enthusiasts can access and share datasets on a wide range of topics. Users can explore datasets, participate in competitions, and engage with the data science community.
    - Data.gov: Data.gov is the official open data portal of the United States government, providing access to thousands of datasets from federal agencies and departments. Researchers can find datasets on various topics, including agriculture, climate, energy, health, transportation, and more.
    - National Center for Education Statistics (NCES): The NCES collects P-20 educational data across the nation and provides it for researchers.
    - Google Dataset Search: Google Dataset Search is a tool that allows researchers to discover datasets from a wide range of sources across the web. Users can search for datasets by topic, keywords, or specific data attributes.

These are just a few examples of websites where researchers can find datasets for secondary data analysis. Depending on your research topic and discipline there are many other data repositories and sources available for accessing and analyzing existing datasets. The following databases such as Web of Science (WoS) and SCOPUS are two widely used multidisciplinary databases that provide access to scholarly literature, including journal articles, conference proceedings, and other academic publications. While these databases primarily serve as platforms for accessing research articles rather than raw datasets, researchers can still utilize them in several ways for quantitative research.

- **Literature Review and Background Research:** Researchers can use WoS and SCOPUS to conduct comprehensive literature reviews and gather background information on their research topics. By searching for relevant keywords, authors, or topics, researchers can identify existing studies, theories, and methodologies related to their research area, helping to contextualize their

own research within the broader scholarly discourse.

- **Citation Analysis:** WoS and SCOPUS provide citation databases that allow researchers to track citation patterns, identify influential articles, and analyze citation networks within specific fields or research domains. Citation analysis can help researchers identify key publications, researchers, and research trends, providing insights into the impact and dissemination of scholarly work overtime.
- **Bibliometric Analysis:** Researchers interested in bibliometric analysis, scientometrics (patterns and trends in scientific literature), or research evaluation can use WoS and SCOPUS to collect bibliographic data on publications, authors, journals, and institutions. By analyzing publication patterns, citation counts, collaboration networks, and other bibliometric indicators, researchers can assess research productivity, impact, and collaboration patterns within specific disciplines or research communities.
- **Data Mining and Text Analysis:** While WoS and SCOPUS primarily index metadata and abstracts of publications, researchers can still access full-text articles from many journals within these databases. Researchers interested in data mining, text analysis, or natural language processing techniques can extract data from full-text articles to conduct content analysis, sentiment analysis, topic modeling, or other text mining approaches.
- **Quantitative Analysis and Meta-analysis:** Researchers can download metadata or citation data from WoS and SCOPUS to conduct quantitative analysis or meta-analysis studies. By aggregating data from multiple studies or publications, researchers can analyze trends, patterns, or relationships across a larger body of literature, providing empirical evidence to support their research hypotheses or research questions. Overall, while WoS and SCOPUS may not offer raw datasets in the same way as dedicated data repositories, researchers can still leverage these databases to access scholarly literature, conduct bibliometric analyses, track citation patterns, and gather data for quantitative research studies. By combining insights from the literature with other research methods and data sources, researchers can enhance the rigor, validity, and impact of their quantitative research endeavors.

7. Reporting

Once you complete tour research, you may want to share it because reporting is all about sharing your findings and informing stakeholders about your findings depending on the purpose. The researcher who publishes his/her research gets the ownership of that research adding to the field of knowledge. The research which is not published does not have any value. Report writing requires general research language and writing guidelines including the step-by-step plan. In addition, the writing needs to adhere to

a publication style. In educational and social science research, the current edition (7th, currently) of the *Publication Manual of the American Psychological Association* (2020) is the most commonly used style guide.

Furthermore, there are many ways to report findings depending on why research is conducted in the first place and who the audience is. Is this a school report to be shared with a school community? Is this a report to make data driven decisions? Is this a proposal, the first part of a thesis/dissertation which leads to a degree? Is this a journal article to be published in a peer-reviewed journal? Or is this a conference paper to be shared with the conference community?

Let us now look into how we can effectively report our quantitative research to ensure clarity, transparency, and credibility. A well-structured research report typically follows a format which can be abbreviated as **IMRaD**:

- ***I**ntroduction*: Establishes the research problem, significance, objectives, and hypotheses. It provides a theoretical framework and a review of relevant literature.
- ***M**ethodology*: Details the research design, sample selection, data collection procedures, and statistical analysis techniques. This section ensures replicability and justifies methodological choices.
- ***R**esults:* Presents findings using descriptive and inferential statistics, often with tables, graphs, and figures. Data should be reported objectively, avoiding interpretation in this section.
- ***D**iscussion:* Interprets results in relation to the research question, comparing findings with existing literature. Discusses implications, limitations, and potential biases. Additionally, a summary is provided on key findings, highlight of contributions with suggested directions for future research or practical applications.

In sum, in reporting it is fundamental to 1) use clear, concise, and precise language; 2) report statistics correctly; 3) avoid overgeneralization and acknowledge study limitations; and 4) adhere to current APA or other discipline-specific formatting guidelines.

The Role of Statistics in Quantitative Research

As in the previous chapter, unlike qualitative research, which focuses on understanding subjective experiences and perspectives, quantitative research aims to produce objective, replicable findings based on quantifiable measures.

The role of statistics in quantitative research is multifaceted and essential for various

aspects of the research process, but before explaining the roles of statistics (noun/singular) in quantitative research, it is critical to define what statistics really is. According to Rowntree (1984), statistics has at least four different explanations: 1) it is a subject or discipline; 2) methods used to collect, analyze, and interpret data; 3) it may "refer to certain specially calculated figures (e.g. an average) that somehow characterize such a collection of data" (p. 17).

Additionally, according to Stigler (2016):

> statistics has changed dramatically from its earliest days to the present, shifting from a profession that claimed such extreme objectivity that statisticians would only gather—not analyze them—to a profession that seeks partnership with scientists in all stages of investigation, from planning to analysis. (p. 1)

Now let us explore the details of statistics in data description (descriptive statistics) and data analysis (inferential statistics), two fundamental branches of quantitative research after data collection. Let us also remember that "in many instances… the researcher's primary objective is to draw conclusions that extend beyond the specific data that are collected" (Huck, 2000, p. 111).

- **Data Description:** At a first glance, prior to our analysis, we need to describe and summarize our data. During this stage statistics plays a crucial role. This first form of statistics, descriptive statistics includes measures of central tendency (mean, median, mode) and measures of variability (range, variance, standard deviation), and provide researchers with a clear understanding of the characteristics and distribution of their data (Popham & Sirotnik, 1992). By organizing and presenting data effectively, statistics can help researchers identify patterns, trends, and outliers, laying the foundation for further analysis.
- **Data Analysis:** Second, quantitative research often involves analyzing numerical data to test hypotheses, identify relationships, and make predictions. Statistical analysis techniques, such as inferential statistics, enable researchers to draw conclusions about populations based on sample data. By applying probability theory and hypothesis testing methods, researchers can determine the likelihood of observed differences (experimental design) or relationships (correlational design) being reflective of true population parameters. Common statistical tests include *t-tests*, *analysis of variance* (*ANOVA*), *correlation coefficient*, *regression analysis, and chi-square tests, among others.*

Now let us delve into the details of descriptive and inferential statistics to be able to analyze and interpret numerical data.

Descriptive Statistics

Descriptive statistics is used to summarize and describe the main features of a dataset. They provide simple summaries about the sample and the measures. Common descriptive statistics include 1) measures of central tendency (such as mean, median, and mode) and 2) measures of variability (such as range, variance, and standard deviation). Descriptive statistics helps researchers understand the basic characteristics of their data, such as its distribution, dispersion, and typical values. They are particularly useful for organizing and presenting data in a clear and understandable manner, making it easier to interpret and draw preliminary conclusions.

For an example, first, if a school wanted to determine the average achievement test results, they we would need to look into the mean score by adding up all the scores and dividing them up by the total number of participants. Second, if they wanted to know what the median of the test results is, they would look into the score that falls in the middle of the distribution. Third, they may want to calculate the mode, which is looking into the scores regarding which is the most frequently repeated score. Understandably, these scores do not tell us the spread/range of scores.

If we wanted to see how the achievement test scores were clustered, we would need to look into the measures of variability (such as range, variance, and standard deviation). For an example to calculate the standard deviation (SD), we need the mean of the scores as a starting point, and look into the differences between scores.

Inferential Statistics

Inferential statistics, however, is used to make inferences or predictions about a population based on sample data. Unlike descriptive statistics, which focus on summarizing observed data, inferential statistics involves using probability, making estimates or predictions to draw conclusions about the population from which the sample was drawn. Researchers use inferential statistics to test hypotheses, make predictions, and determine the likelihood that observed differences or relationships in the sample are reflective of true differences or relationships in the population. Common inferential statistical techniques include *t-tests*, *analysis of variance (ANOVA), regression analysis,* and *chi-square tests.* These techniques enable researchers to generalize findings from their sample to the broader population, providing insights into underlying relationships and patterns that may exist beyond the observed data.

To summarize, in quantitative research, both descriptive and inferential statistics play crucial roles in data analysis and interpretation. Descriptive statistics are often used to summarize and present the main characteristics of the data, providing an initial understanding of the variables under study. Inferential statistics, on the other hand,

allow researchers to test hypotheses, make predictions, and draw conclusions about population parameters based on sample data. By combining both descriptive and inferential statistics, researchers can gain comprehensive insights into their research questions, identify significant findings, and make informed decisions based on empirical evidence.

Overall, descriptive and inferential statistics are essential tools in quantitative research, enabling researchers to analyze, interpret, and draw meaningful conclusions from numerical data. By employing these statistical methods appropriately, researchers can contribute to the advancement of knowledge in their respective fields and inform evidence-based practices and policies.

Conclusion

Quantitative research provides a structured and objective approach to investigating educational phenomena through numerical data. Its strength lies in its ability to generalize findings, identify patterns, and establish relationships or causal links using statistical methods. Common designs include descriptive, correlational, quasi-experimental, and experimental studies, each serving different research purposes. Researchers rely on descriptive and inferential statistics to analyze data, ensuring validity and reliability in their findings. While quantitative methods offer precision and replicability, they may overlook contextual nuances. Ethical considerations (see section 2 of this book entitled *Values & Ethics of Social Research*), such as informed consent, data integrity, and transparency, are essential to conducting rigorous research. By mastering quantitative approaches, graduate students can critically assess educational issues and contribute to evidence-based decision-making in the field.

Key Takeaways

1. Since quantitative studies produce numerical data, statistical analysis is central to the findings and applications of quantitative research on social/behavioral topics.
2. Descriptive statistics describe a variable (such as an average response), whereas inferential statistics seek potential relationships among the variables (such as cause-and-effect).
3. Validity and reliability are key metrics of the quality of a quantitative study and its instruments.

Additional Resources

Quantitative Data Analysis Software

SPSS (https://www.ibm.com/spss)

R (https://www.r-project.org/) – *free*

Datasets

The U.S. Census Bureau

The World Bank

The Inter-university Consortium for Political and Social Research (ICPSR)

Kaggle Datasets

Data.gov

National Center for Education Statistics (NCES)

Google Dataset Search

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9

PRELIMINARY CONSIDERATIONS FOR QUALITATIVE SOCIAL RESEARCH

Phillip Olt

Definitions of Key Terms

- Constructivism: The commitment that, whether objective truth exists or does not, it is only understood by humans as we construct it, which is driven by prior knowledge and social discourse.
- Explanatory: Giving deeper insight to a previously-studied phenomenon
- Exploratory: Giving preliminary insight to an un-/under-studied phenomenon
- Interview Protocol: The set of questions and plan to be used conducting an interview
- Method: A way of doing something; for example, a survey is way of collecting quantitative data, and an interview is a way of collecting qualitative data.
- Methodology: Properly, "the study of methods;" in practice, a methodology is an over-arching approach to research that has coherent purpose, data collection methods, data analysis, and outcomes.
- Positivism: The belief that objective truth exists and is knowable through (and only through) scientific methods.
- Post-Positivism: An extension of Positivism, holding that objective truth exists but is only knowable by humans in part and contingently.
- Qualitative: An approach to social research that focuses on the collection and analysis of non-

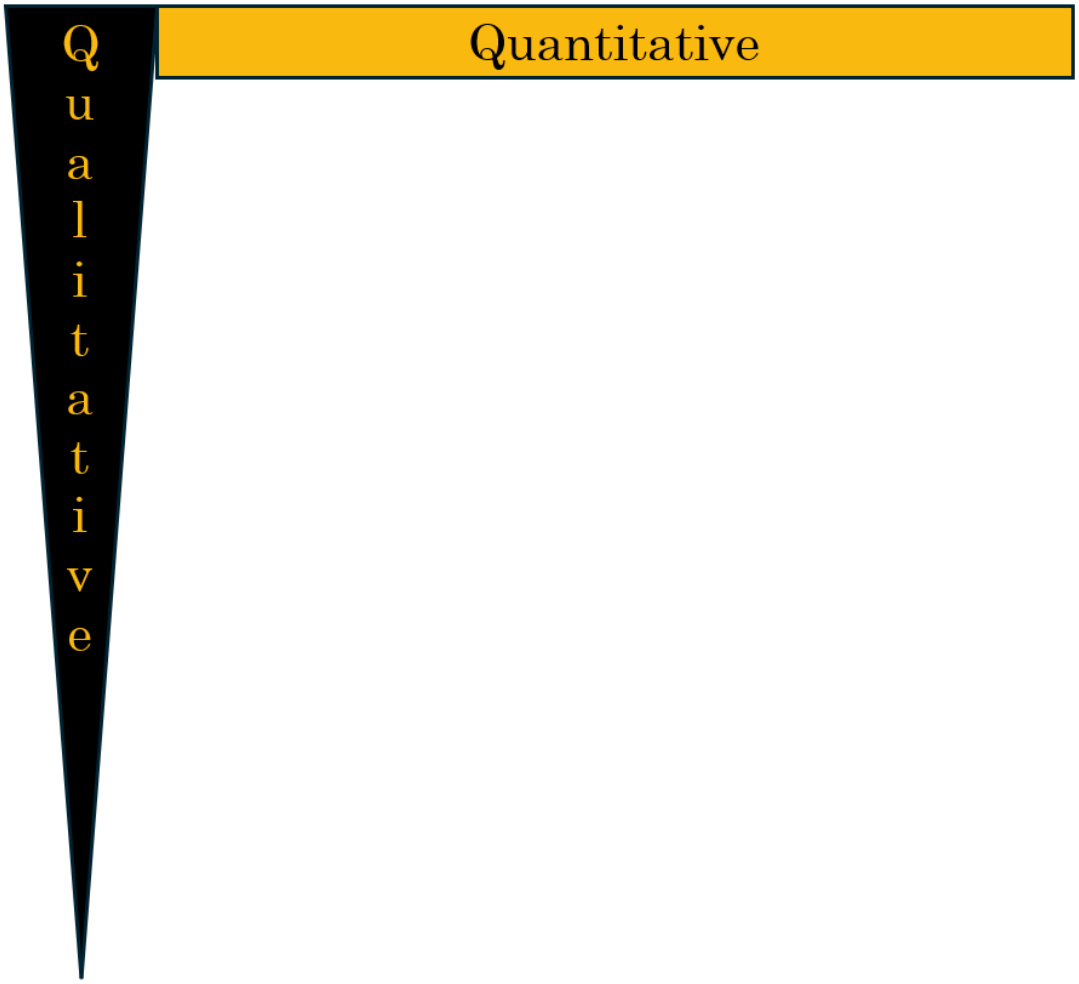
numerical data about a phenomenon to explore its qualities. Often, qualitative research is used in either an exploratory (*giving preliminary insight to an un-/under-studied phenomenon*) or explanatory (*giving deeper insight to a previously-studied phenomenon*) way.
- Triangulation: Utilizing multiple data sources to enhance the trustworthiness of qualitative research.
- Trustworthiness: An approach to evaluating the quality of qualitative research based on the "integrity of the data, balance between reflexivity and subjectivity, and clear communication of findings" (Williams & Morrow, 2009, p. 577).

What is "qualitative" research?

While quantitative research typically uses numerical data and seeks to generalize findings from a sample onto the population, qualitative research is, in many ways, a reversed mirror image. Qualitative research is focused on gaining a depth of understanding about a topic. Qualitative research rarely includes numerical data, rather most commonly relying on first-hand accounts (interviews, focus groups), visual records (pictures, videos), and/or primary source documents. While quantitative research might utilize some open-ended data (ex., from a survey question), that is often analyzed quantitatively, such as looking for a fixed set of possible answers and counting how frequently each appears. Qualitative analysis will often look quite different, such as coding, followed by categorizing, and finally themeing (Saldaña, 2016). This process will be explored in greater detail in the future chapter on qualitative data analysis. Thus, qualitative research is an approach to social research that focuses on the collection and analysis of non-numerical data about a phenomenon to explore its qualities.

I often discuss quantitative and qualitative research as complementary. Qualitative research is frequently (though not always) used in either an exploratory or explanatory way. When used in an exploratory fashion, a qualitative study might be done to consider something that has not specifically been studied before, such as how a certain immigrant population experiences their first year in primary education in the United States. This might help those working with that (or similar) population, help policy makers better understand the degree of difficulty faced, or generally create empathy. Then that study—by itself or in conjunction with other studies—might be used as the basis for a large-scale quantitative investigation to produce generalizable findings about, say, the experience of immigrant groups entering United States primary education. Qualitative research is also used in an explanatory fashion. If a quantitative survey had a generally consistent data set except for a small cluster of responses far from the trend line, those outliers might be an excellent population to do follow-up qualitative study with to explain how or why they are so far from the others.

Consider the visual in the diagram below for a qualitative-quantitative sequence of studies, wherein qualitative research is being used first in an exploratory fashion.



Visualizing quantitative research as breadth (gathering numerical data from a large number of sources and generalizing findings on the population), whereas qualitative research is visualized as depth (gathering data from a small number of key sources to provide rich, thick description).

Presuppositions and Philosophical Commitments

As previously discussed in the parallel quantitative research chapter, the philosophical commitments one has about research and T/truth more broadly end up having significant practical impacts on how the research is done. Qualitative researchers tend to come from more varied philosophical commitments than quantitative. Though there could be many chosen to discuss here, I will focus on the two largest and most historically influential to qualitative research: post-positivism and constructivism.

Post-Positivism

In that parallel quantitative chapter, I discussed post-positivism and social research. However, it does have some differential impact on qualitative research as compared to quantitative. In a practical sense, post-positivist qualitative researchers tend to be very concerned with their qualitative research emulating quantitative methods (and thus natural science methods). It is common for post-positivists to utilize concepts like validity and reliability redefined for a qualitative context and then applied to their research. There is also often great focus given to formally following established rules, consistency, and rigor.

Constructivism

Cobern (1993) described constructivism as a "model of how learning takes place" (p. 105). Note that research *is* learning, so it is a reasonable application from pedagogy to research. Cobern further described that constructivism emerged from the recognition that scientific knowledge was limited to physical reality, which itself can only be perceived and described based on previously existing knowledge. Of course, social experiences exist as much in the human mind as they do in the physical realm, and they only have meaning in the mind. Only studying the physical aspects of a social experience will leave one with a woefully shallow understanding of those phenomena. Key aspects of constructivism for research then (based off Cobern, 1993) are that: the researcher is an active participant in the process of knowledge creation, and social knowledge generation involves interpretation, which is based on prior knowledge and discourse.

So, more succinctly stated, constructivism is the commitment that, whether objective truth exists or does not, it is only understood by humans as we construct it, which is driven by prior knowledge and social discourse. In the qualitative context, constructivists then tend to emphasize participant voices, participatory methods, methodological flexibility/creativity, and subjectivity.

Inductive Reasoning

Qualitative research generally relies upon inductive reasoning, which is often described as going from small → large in scale. In other words, one collects a variety of small-scale observations and comes to a tentative conclusion. In practice, this might look like:

- This qualitative study includes feedback from 11 elementary teachers who found <pedagogical practice> to be effective in their classes.
- <Pedagogical practice> is likely to be effective for elementary teachers in the same cultural setting.

A good practitioner might extend that even extend that a step further beyond reasoning and into their work:

- <Pedagogical practice> is likely to be effective in my elementary classes. I should try it and assess it through action research.

Saldaña and Omasta (2018) described the relationship between inductive reasoning and qualitative research in this way: "Induction is open-ended exploration of a problem, going into an inquiry to learn as you go, formulating answers as more information is compiled… Much of qualitative research is inductive inquiry or analytic induction, because researchers generally begin with open-ended questions for investigation rather than fixed hypotheses to test" (p. 9).

Researcher Positionality

Including a researcher positionality statement is a very common, perhaps even expected, component of a qualitative research paper, but, while it would likely be almost as important for quantitative studies, they are extremely uncommon there. A researcher positionality statement is usually approximately one paragraph and explains the relationship of the researcher to the topic. It commonly includes any relevant demographic relationships or non-relationships (ex., the author's own racial identity and experience in a study that involves race) as well as direct experiences with the topic.

If, for example, one was studying the burnout of social workers contributing to leaving the profession, it would be quite relevant to know that the author had previously been a social worker but quit the profession after feeling burned out. Knowing this allows readers to attempt to account for potential biases in design, analysis, and interpretation. I have provided a sample positionality statement for myself in a fictional study on college faculty members' tenure processes.

Sample Positionality Statement for a Study on Faculty Experiences with the Tenure Process

As a tenured associate professor, I acknowledge that I cannot consider the topic of the tenure process absent of my own. At my institution, faculty members submit a full tenure portfolio for consideration at various levels each year over the six-year probationary period. During this time, I recall experiencing a great deal of frustration at the time expended to prepare the lengthy portfolios, as well as feeling like I had to tailor everything I did to maximizing the positive impact measured by the tenure criteria. However, I did value the feedback I received from the many colleagues who reviewed my documents over the years. I consider myself fortunate to have earned tenure and promotion to associate professor. I am now writing this two years later, having chaired our department's recent committee to revise the tenure & promotion criteria.

Methods of Qualitative Data Collection

Qualitative data, as discussed earlier in this chapter, are quite open-ended, as opposed to numerical/statistical representations. In quantitative social science, the methods of data collection generally stand on their own in place of a methodology (for better or worse), especially in regard to how that is written in a journal-article length manuscript. Qualitative research, however, uses methods for data collection and analysis, but those methods are selected and utilized within a methodology.

As the great grounded theorist Barney Glaser (2007) famously said with regard to qualitative research, "all is data" (para. 1). As such, the methods of collecting qualitative data are quite broad. Below are three of the most common examples, but this is only a skim at the surface of qualitative data collection methods.

Interviews

An interview occurs when a researcher directly and individually asks questions of a participant to gather data. The set of questions/interview plan is generally referred to as an "interview protocol." Interviews *can* be used as a quantitative data collection tools, with scripted questions read verbatim that yield quantitative data.

However, qualitative interviews generally fall into the categories of structured, semi-structured, and unstructured. In a structured protocol, questions are asked verbatim, and the predetermined list of questions does not change. The questions are often designed to generate succinct answers, and there tend to be more questions than other types of qualitative interviews. In a semi-structured protocol, there is usually a smaller set of questions (say, 5-10) that are worded to generate longer answers. The interviewer will often adapt questions to the interviewee and ask follow-up/clarifying questions. In an unstructured protocol (commonly used in phenomenological interviews), there might just be a single, open-ended question posed to the participant. The interviewer then follows up in a more conversational style based on what the participant says in response to the first question.

I often think of structured interviews as the science of interviewing, while unstructured and semi-structured are more the art of interviewing. Structured interviews produce consistent responses and minimize researcher interjection; however, they can produce answers without meaning or inadequate to really answer qualitative research questions. However, all three types have value in qualitative research.

Focus Groups

Focus groups are very similar to interviews but with multiple participants

simultaneously, and sometimes they are even referred to as group interviews. However, as with many things, the group is more than a sum of its members. Focus groups can be effective way to gather information from multiple participants in a short amount of time, also allowing the researcher to observe and listen to interaction among the group. Focus group participants are often a sub-set of a larger group that is carefully selected to give feedback.

Observations

Sometimes, qualitative researchers get great value from observing—whether from a distance or as a participant. Observations allow us to observe people and systems behaving naturally. Such qualitative observations may emerge just from taking notes or memos on what is seen extemporaneously, and a good qualitative researcher is always open to documenting the unforeseen. However, when possible, it is best to plan an observation intentionally, including goals for what is being looked for.

A Healthy Dose of Skepticism

As referenced in the parallel quantitative research chapter, skepticism is essential to good research. Here are four of the most common issues associated with qualitative research:

- Data integrity & authenticity
- Researcher bias
- Errant generalization
- Difficulty defining "good" qualitative research

Data Integrity & Authenticity

How do we know the qualitative data are real? Because of protections for participants, it is very rare for qualitative research reports, such as journal articles, to include identifiable participants. If, for example, a participant mentions something that would get them fired, that might be very important data to report in findings, but making it identifiable would cause harm to the participant. As such, it is impossible for readers, peer reviewers, or editors to independently verify that the data came from actual participants (as opposed to the researcher making it up, using AI to generate simulated interviews, etc.).

This concern is more than hypothetical. Specifically, one should consider the case of Dr. Alice Goffman (Beuving, 2020; Neyfakh, 2015; Parry, 2015). Goffman's sociological research on inner cities was initially lauded as groundbreaking, but shortly after the

publication of her book, a firestorm erupted. Parts of her stories would implicate her in crimes and others would have been impossible, which upon being confronted with she acknowledged as having been fabricated. However, she defended that approach as protecting participant confidentiality and that her fictional data actually best represented what she saw as the truth. For those coming from a big-T Truth perspective, this was an incredible affront to the rigors of "good" research, and even most of those from a little-t truth perspective were taken aback. In one sense, Goffman was simply best representing her interpretation of the truth while anonymizing data to protect participants; from another, she was telling fictional stories and selling them as nonfiction.

This particular saga illustrates one of the greatest limitations inherent to qualitative research—the authenticity and integrity of the data is unverifiable.

Researcher Bias

Having some parallels to data integrity and authenticity (which is about its collection and the data themselves), it is also very easy for the qualitative researcher to insert their own bias into the analysis and interpretation of the findings. Indeed, it is impossible for a human to truly remove their biases from research design, data collection, analysis, and interpretation. While that is usually subtle in quantitative research, it is overt in qualitative, as rather than formulae to answer questions there are human decisions made to analyze and interpret. Some qualitative researchers even embrace bias to the extent of intentionally magnifying it.

To illustrate, consider an essay on "college football referees" that is written by a fan of a specific college football team that lost in the College Football Playoff due to an obvious referee error on the last play. How might their experience affect the evidence they select to support the points they choose to make? Does that, however, automatically make their point invalid? Could such an essay only be written well by someone who does not follow college football at all (i.e., unbiased), but if so, would that not introduce its own set of drawbacks to the points being made?

It is ultimately on the author to communicate their known biases (usually through a researcher positionality statement) and then on the readers to account for how that bias may have affected interpretation.

Errant Generalization

This problem tends to emerge more from readers than the authors of studies, but that is no less problematic. It is easy to read a compelling qualitative paper and consciously or subconsciously think that's just the way things are… everywhere. While quantitative

studies can also be over-generalized, qualitative studies should almost never be generalized (in a technical sense) at all. It is incumbent upon the readers to not infer true applicability beyond the setting of the study itself, but then those same readers must look for areas in which the study overlaps with their setting to find insights.

Difficulty Defining Quality

What makes a qualitative study "good?" There are a great number of opinions. Whereas quantitative studies utilize widely agreed upon metrics like validity and reliability, there is no direct parallel for qualitative research. Thus, perceptions of defining quality vary *wildly* among qualitative methodologists and others.

For an illustration, we will consider van Manen's (2016) approach for a specific phenomenological sub-type (hermeneutic phenomenology), which is itself a type of qualitative research. He proposed four criteria to serve as proxy measures for validity: is the study based on a phenomenological question, are the data experientially descriptive accounts, is the study rooted in phenomenological literature rather than general methodological sources, and does it avoid using any non-phenomenological validation criteria (pp. 350-351)? On reliability, he noted that, "it is unlikely that a phenomenological study would be involved in measurement schemes involving interrater reliability by having different judges… The point is that phenomenological studies of the same 'phenomenon' or 'event' can be very different in their results" (p. 351). Finally, he concluded that, "empirical generalizations cannot be drawn from phenomenological studies" (p. 352).

Now, contrast van Manen's approach within phenomenology to Yin's (2014) approach to case studies (another type of qualitative research). Yin called for strict protocols to create construct, internal, and external validity that are an approximation of quantitative methods, and he defined reliability as the "consistency and repeatability of the research procedures used in a case study" (p. 240), which, if done well, would allow a "later investigator should arrive at the same findings and conclusions" (p. 48).

A major contributing factor to these differences is the philosophical commitments held by these two authors and by members of differing traditions (Yin, though claiming to be constructivist, is widely believed to be a post-positivist). Though such issues may seem irrelevant to a new qualitative researcher, there are significant implications, ranging from what does or does not get published to even getting basic approvals from local ethics boards to conduct research.

One concept that has gained a reasonable amount of traction is that of trustworthiness, which is an approach to evaluating the quality of qualitative research based on the "integrity of the data, balance between reflexivity and subjectivity, and clear

communication of findings" (Williams & Morrow, 2009, p. 577). The integrity of the data is evaluated by whether the amount of data is adequate to draw conclusions from and the dependability of the the data itself. Then, the balance between reflexivity and subjectivity refers to the ability to balance researcher interpretation with the meaning used by participants. Finally, the clear communication of the findings indicates that qualitative studies should be readable and understandable by the original participants, scholars, and practitioners in the field of study.

Merriam and Tisdell (2016) also discussed the concept of trustworthiness for the rigor of a qualitative study, including eight tenets: triangulation, member checks/respondent validation, adequate engagement in data collection, research position or reflexivity, peer review/examination, audit trail, rich thick descriptions, and maximum variation (p. 259). That is not, however, to say that every study must address all of those fully to be "good" or that they are fully appropriate to every methodology (ex., a narrative study with a single participant would not have maximum variation in participants).

It is important to note, however, that all the tenets of Williams and Morrow's (2009) and Merriam and Tisdell's (2016) trustworthiness are qualitative themselves. It is entirely possible that different evaluators of a qualitative study come to completely different conclusions about whether the study met those metrics. For those conducting qualitative studies, it is then advisable that they consider each of these metrics carefully, make a reasoned decision on each, and communicate that process of decision making in the manuscript reporting findings.

Key Takeaways

1. Qualitative research emphasizes the depth of understanding rather than the breadth of generalizability.
2. Qualitative research is most frequently (though not always) used in either an exploratory or explanatory fashion.
3. Qualitative research embraces subjectivity and participant voice, largely through non-numerical data like interviews, focus groups, or even artistic expressions.
4. Neither qualitative research nor its researchers are perfect. It is the responsibility of the readers of qualitative studies to carefully examine what they read and consider how it does/does not apply in their context.

Additional Open Resources

The two journals below are open-access sources of peer-reviewed qualitative research and methods. They are excellent sources to find qualitative methodological guides, nuances, and considerations.

The Qualitative Report (https://nsuworks.nova.edu/tqr/)

Forum: Qualitative Social Research (https://www.qualitative-research.net/index.php/fqs)

Chapter References

Beuving, J. (2020). Problems of evidence in ethnography. A methodological reflection on the Goffman/Mead controversies (with a proposal for rules of thumb). *Forum Qualitative Sozialforschung Forum: Qualitative Social Research, 22*(1), Art. 1. https://doi.org/10.17169/fqs-22.1.3567

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Parry, M. (2015, June 12). Conflict over sociologist's narrative puts spotlight on ethnography. *The Chronicle of Higher Education.* https://www.chronicle.com/article/conflict-over-sociologists-narrative-puts-spotlight-on-ethnography/

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van Manen, M. (2016). *Phenomenology of practice: Meaning-giving methods in phenomenological research and writing*. Routledge.

Williams, E. N., & Morrow, S. L. (2009). Achieving trustworthiness in qualitative research: A pan-paradigmatic perspective. *Psychotherapy Research, 19*(4-5), 576-582. https://doi.org/10.1080/10503300802702113

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10

TYPES OF QUALITATIVE RESEARCH

Phillip Olt

Definitions of Key Terms

- Arts-based Qualitative Research: A suite of qualitative research approaches that includes creative, artistic acts as central to the data collection and/or generation, as well as the final representation of research
- Bounded: A term associated with the case study methodology, wherein what is and what is not inside the case being considered is precisely defined
- Bracketing: A term associated with the phenomenology methodology, wherein the researcher removes themself from the design, data collection, and analysis
- Bridling: A modification of bracketing, wherein the researcher does not pretend they can be totally separated from the research but does attempt to account for and lay bare their influence in the work
- Case Study: A comprehensive qualitative investigation of a key case to illuminate some facet important to further research, theory, and/or practice
- Constructivism: The commitment that, whether objective truth exists or does not, it is only understood by humans as we construct it, which is driven by prior knowledge and social discourse
- Descriptive Theory: A social science theory that explains a social phenomenon solely by using data and analysis
- Emic: A term usually associated with the ethnography methodology, which represents the insider perspective and knowledge about a culture/culture-sharing group held by the members of the culture/culture-sharing group themselves
- Epistemology: Properly, "the study of knowledge;" in practice, it is the study of knowledge/

truth and how we know it, complete with a set of philosophical positions
- Ethnography: A qualitative methodology focused on the study of culture and/or culture-sharing groups
- Etic: A term usually associated with the ethnography methodology, which represents the outsider perspective and knowledge about a culture/culture-sharing group, usually of the researcher and their publication's readers
- Exploratory: Giving preliminary insight to an un-/under-studied phenomenon
- General Qualitative Research: Qualitative research that uses qualitative methods but does not follow an overarching methodology. While common, this is usually considered weaker than a qualitative study that uses a coherent methodology to design the study, analyze the data, and interpret meaning.
- Grounded Theory: A qualitative methodology that aims to generate exploratory theoretical explanations of human/social processes through prescriptive approaches to data collection and analysis
- Method: A way of doing something; for example, a survey is way of collecting quantitative data, and an interview is a way of collecting qualitative data
- Methodologist: Someone who specializes in a type of research methodology
- Methodology: Properly, "the study of methods;" in practice, a methodology is an over-arching approach to research that has coherent purpose, data collection methods, data analysis, and outcomes
- Narrative Inquiry: A qualitative methodology wherein the qualitative researcher focuses on collecting storied data, re-storying those into a chronological narrative, and highlights key event(s) as the narrative turn(s) in the story
- Ontology: Properly, "the study of being;" in practice, it is the study of what is/is not real and what the nature of existence is, complete with a set of philosophical positions
- Phenomenology: A qualitative methodology that is an applied approach to philosophy (usually, epistemological and/or ontological), characterized by a pure focus on the human experience of a phenomenon
- Photovoice: "A visual method for interrogating subjective perspectives" (Versey, 2024, p. 594)
- Post-Positivism: An extension of Positivism, holding that objective truth exists but is only knowable by humans in part and contingently
- Qualitative Description: A form of general qualitative research that is focused on a dispassionate researcher attempting to report participant content and interpretations with minimal inferences or insertions of theory
- Re-story: Commonly done in narrative inquiry, the researcher gathers various qualitative data (usually in the form of stories themselves) and then weaves them together into a new, coherent story
- Saturation: "An intuitive feeling that nothing new about the site and its participants is being learned after an extended observation or analytic period" (Saldaña & Omasta, 2018, p. 419)

Creswell (2013) proposed five approaches to qualitative research: narrative, phenomenological, case study, grounded theory, and ethnographic. However, among qualitative methodologists, that text is quite controversial. Qualitative research is rapidly evolving and emerging. There are literally hundreds of methodological approaches to doing qualitative research, and undoubtedly those five are too narrow. It is a post-positivist take on a method of inquiry that increasingly rejects post-positivism as too rigid.

In this chapter, we will consider general qualitative research (i.e., that which uses qualitative methods but does not follow an over-arching methodology), Creswell's major qualitative traditions, and other qualitative methodologies. It is important to note here that this chapter only superficially touches on each, leaving out an incredible amount. That is, however, content better suited for Tier 2 qualitative coursework and texts.

One common question across qualitative research is, "how many participants do I need?" I have heard very committed views by self-proclaimed qualitative "experts" expressing that a minimum of 500 participants is needed all the way down to only needing 1. Those from a more quantitative and positivist/post-positivist backgrounds tend to expect larger numbers. However, there can be a huge difference between what a journal editor or dissertation chair expects and what is "right" (though, I prefer the term "appropriate" over "right"). It is incumbent upon the researcher to decide whether to rely on methodological texts to determine an appropriate number of participants or cede to a journal editor/dissertation chair who has different opinions. In the methodologies representing major qualitative traditions below, I will touch on generally recognized, appropriate expectations for participants; however, one overarching concept is that of saturation, which Saldaña and Omasta (2018) defined as "an intuitive feeling that nothing new about the site and its participants is being learned after an extended observation or analytic period" (p. 419). This is something *only* the researcher(s) can determine, but it is a good thing to articulate how, when, and why that determination was made.

General Qualitative Research

General qualitative research occurs when a researcher uses qualitative methods but without a methodology. That might mean they conducted focus groups of 4th Grade teachers in a school district, and then they looked for qualitative themes in the data; however, it was not a phenomenological or case study. It was just a collection of data from focus groups. A qualitative study lacking a methodology is often seen as inferior or weaker, but yet it may actually be the most published type of qualitative research. Sometimes it is referred to as just "descriptive," since it lacks the methodology for greater application or connection to broader themes. Ellis and Hart (2023), however, argued for the value of this approach, especially for exploratory uses (where the results of the study then are the springboard for further studies). General qualitative research allows researchers to do whatever needs to be done qualitatively to investigate a research question, even when existing methodologies do not align well with the question.

Qualitative description (QD) is, in some ways, its own methodology, but taxonomically,

it most appropriately falls underneath general qualitative research. It is somewhat more highly regarded as being coherent and purposeful, though it has fallen in status with the increasingly theory-driven world of academic social research. Sandelowski (2000) described QD as "a comprehensive summary of an event in the everyday terms of those events. Researchers conducting such studies seek descriptive validity, or an accurate accounting of events that most people (including researchers and participants) observing the same event would agree is accurate, and interpretive validity, or an accurate accounting of the meanings participants attributed to those events that those participants would agree is accurate" (p. 336). Ocean and Hicks (2021) added that, "QD researchers document what is occurring, instead of what we assume is happening, using the voices of those directly impacted by a phenomenon" (p. 701). It does include qualitative data analysis—it is *not* just copying/pasting transcripts; however, the purpose is for that analysis to most directly reflect the participants' content and meaning, rather than any researcher or theory.

Because of the undefined nature of this approach, the methods of data collection and analysis, as well as the number of participants, are undefined. It is even more incumbent upon the researcher to defend their decisions on these matters.

Example General Qualitative Study

Bravo-Moreno, A. (2019). Choice mums and children's education. Does feminism matter? A qualitative study. *The Qualitative Report*, *24*(4), 921-947. https://doi.org/10.46743/2160-3715/2019.3865

Example Qualitative Description Study

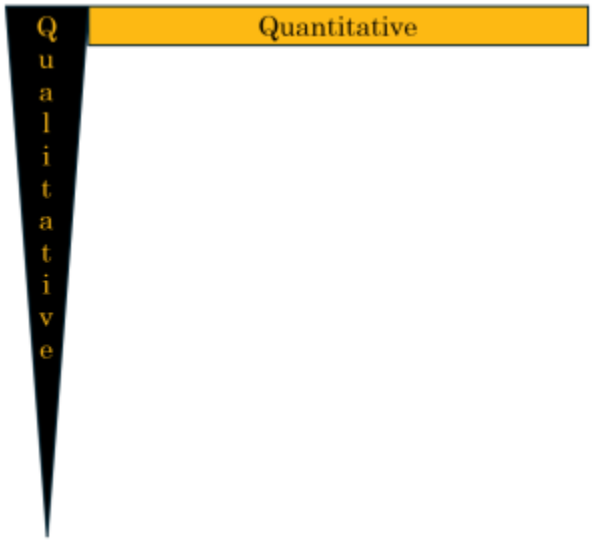
Ocean, M., & Hicks, K. T. (2021). A qualitative description investigation of U.S. higher education quantitative datasets. *The Qualitative Report*, *26*(3), 696-713. https://doi.org/10.46743/2160-3715/2021.4397

Major Qualitative Traditions

Narrative Inquiry

As a qualitative researcher, I often describe myself as a "professional non-fiction storyteller." Narrative inquiry has a variety of synonymous terms—narrative research, narrative study, etc.—but they are all used to describe qualitative studies that are focused on telling a non-fiction story. Clandinin (2016) described the methodology as "almost anything that uses, for example, stories as data, narrative or story as representational form, narrative as content analysis, narrative as structure, and so forth" (p. 11).

Hearkening back to the illustration introduced in the previous chapter, narrative inquiry is also probably the most "depth"-focused qualitative methodology. It is ideal for digging into the details of an experience, often from the perspective of one person, to really shine a light on what something is like over time.



Chronology is important to narrative inquiry. It is not best suited to a single event or experience (which, respectively, would likely be a case study or phenomenology); rather, that single event might be the climax (or, "narrative turn") of the story, but it should be situated within the events that preceded and followed the event. Thus, a narrative study will normally present findings chronologically as a story (which is actually a report of re-storied qualitative data by the researcher) with a special focus placed on the key point that is the narrative turn.

Note that it is increasingly common to see narrative inquiry conducted wherein the author is also the participant. There are various combined qualitative methodologies (a topic discussed at the end of the chapter) that now feature this, such as the autoethnography (see, Ellis et al., 2011). However, when that is done as specifically a storied, chronological narrative, Clandinin (2011) described that as autobiographical narrative inquiry. Note that most autobiographical writing is not autobiographical narrative inquiry.

The number of participants in a narrative study will vary somewhat based on the specific research questions or sub-type of narrative research. However, it is very common and appropriate for narrative studies to have just one participant. Data is normally connected through a series of interviews with the participant, but it commonly also will include elicitation of memories using artifacts (ex., a picture of that person from

a key event in their life), interviews with people closely associated with the participant (such as family members), and document analysis.

Example Narrative Inquiry

Chang, O., Hong J., & Jeon, B. (2024). A narrative inquiry into the life of a mother for a child with developmental disabilities. *The Qualitative Report, 29*(5), 1496-1512. https://doi.org/10.46743/2160-3715/2024.6445

Example Autoethnography

Olt, P. A. (2018). Through Army-colored glasses: A layered account of one veteran's experiences in higher education. *The Qualitative Report*, *23*(10), 2403-2421. https://doi.org/10.46743/2160-3715/2018.3354

Phenomenology

Phenomenology is an applied approach to philosophy, and it is perhaps the most involved and complex qualitative methodology. van Manen (2016) described how, "doing phenomenology means developing a *pathos* for the great texts, and, simultaneously, reflecting in a phenomenological manner on the living meanings of everyday experiences, phenomena, and events" (p. 23). It is typically focused on ontological and epistemological questions about the human experience, usually by asking research questions such as, "What is _____ like?" For example, in a previous phenomenological study I published, I asked the following phenomenological research question: "What is the academic experience like for freshmen doing their first year of college through synchronous online education in classes blended with face-to-face students" (Olt, 2018, p. 382)?

However, phenomenology is also often confused for general qualitative research and a variety of other qualitative methodologies. A phenomenon is really any *thing*, whether something of physical substance or not (ex., a romantic relationship). So, while in a loose sense, all social research is phenomenological, it is definitely not the case methodologically.

So, what should a phenomenological study look like? Generally, a phenomenological study should:

- Ask an open, phenomenological research question about a human experience
- Be rooted in one of the philosophical traditions and appropriate phenomenological methodological literature (ex., Heidegger, 1927/2008 and van Manen, 2016)

- Be solely focused on the phenomenon not the participants
- Utilize participants who have experienced/are experiencing the phenomenon
- Gather pre-reflective accounts by interviewing those participants (i.e., just descriptive accounts, not with their evaluations or value judgments); such interviews are usually unstructured or very loosely semi-structured
- Engage deeply with the philosophical implications of the study and its findings
- Minimize the influence of the researcher(s) by engaging in "bracketing" or "bridling" (Vagle, 2016)

That last bullet has historically been controversial. Bracketing is where the researcher removes themself from the design, data collection, and analysis. They make it as if they had no role in that and produce a pure exposition of what a phenomenon is like (a process sometimes called "phenomenological reduction"). Borrowing from pop culture, think of Data (an android robot) from the *Star Trek* shows and films attempting to conduct qualitative research. While that might seem like a laudable goal toward objectivity, is that even possible? Increasingly, qualitative methodologists agree that it is not, and so we should stop pretending that it is. Vagle's (2016) post-intentional phenomenology embraces bridling as an alternative, with it being the "reflective, open stance" of the researcher to their topic, wherein they do not pretend they are removed but do attempt to account for and lay bare their influence in the work.

Phenomenological studies vary significantly by sub-type and their parent philosophical tradition. However, common and appropriate numbers of participants range from 1-20. Data collection is almost always done just by interviews.

Example Phenomenology

Modesto, O. P. (2018). A hermeneutic phenomenological study of teen mothers who graduated from an alternative school. *The Qualitative Report*, *23*(12), 2923-2935. https://doi.org/10.46743/2160-3715/2018.2765

Case Study

The concept of a case study emerged from the fields of medicine and law. In both, the unit of work tends to be a single case, and so there is a great deal of attention given by researchers to key cases that illuminate something new and/or important. In medicine, that might be a unique set of comorbidities which were treated successfully, while in law that might be a careful consideration of how a new U.S. Supreme Court ruling sets precedent.

Within the social sciences then, a case study "investigates a contemporary phenomenon (the 'case') in its real-world context" (Yin, 2014, p. 2) to "catch the complexity of a single

case" (Stake, 1995, p. xi). Another way of describing the methodology is that a case study is a comprehensive qualitative investigation of a key case to illuminate some facet important to further research, theory, and/or practice. The "case" being studied can range from a single individual/event to an entire organization. Perhaps the most key element of a case study is that it is tightly "bounded," which means that it is precisely defined as to what is and what is not inside the case being considered. Typically, case studies ask "how" or "why" research questions (Yin, 2014).

Consider the example below:

- Topic: Rural high school teachers in a department of one
- Research Question: How do rural high school teachers manage the curricula of their discipline when working as the only teacher of that discipline in their school?
- Bounded Case: The four core disciplinary teachers (math, science, English language arts, social studies) at Pseudonym High School in a rural Great Plains state

Should one wish to engage in a case study, Stake (1995) and Yin (2014) are the most commonly discussed methodological sources. However, Baxter and Jack (2008) provide an *outstanding* overview of the methodology with a compare/contrast approach and laying out the sub-types of a case study.

The number of participants and methods of data collection for any given case study will be dictated by the bounded case itself. While this concept is somewhat true across all qualitative research, it is especially so in a case study. If the case is bounded such that there are only four in the population, then the number of participants could not exceed four. It is an expectation of the case study methodology that there will be a variety of data sources, and of the qualitative methodologies, the case study is the most likely to include some quantitative data, as the goal of data collection is to collect *all* the relevant data within the case.

Example Case Study

Olt, P. A., & Tao, B. (2020). International students' transition to a rural, state comprehensive university. *Teacher-Scholar: The Journal of the State Comprehensive University, 9,* Art. 4. http://doi.org/10.58809/CBSX6080

Grounded Theory

Coming out of the sociology field, Glaser and Strauss (1967)—the godfathers of grounded theory—described the methodology as "the discovery of theory from data"

(p. 1). However, that was not a new idea, as theory generation had been the bedrock of social sciences for decades at that point. What was revolutionary was that the "data" being talked about were not quantitative but rather qualitative. They saw exploratory qualitative research subjected to constant comparative analysis as an ideal pathway for the formulation (though not verification) of social theories. The theory being generated was to be grounded in data (i.e., a descriptive theory rather than a normative theory), or, as they put it: "theory based on data" (p. 4). Glaser and Strauss approached qualitative research generally and grounded theory specifically from a post-positivist bent. However, Charmaz (2014) deviated from that post-positivism into constructivism "to acknowledge subjectivity and the researcher's involvement in the construction and interpretation of data" (p. 14).

In practice, grounded theorists typically ask "how" research questions focused on explaining human/social processes or relationships. It is the most prescriptive of all qualitative methodologies in how data are collected and analyzed. First, researchers develop tentative theoretical categories from an initial sample that is selected purposely for developing the theory. They then utilize theoretical sampling for their qualitative study until the point of saturation that the theory is fully developed and no longer needs further participants/data. Theoretical sampling, then, is when:

> the researcher aims to develop the properties of his or her developing categories or theory, not to sample randomly selected populations or to sample representative distributions of a particular population. To engage in theoretical sampling, the researcher must have already developed a tentative theoretical category from the data. When engaging in theoretical sampling, the researcher seeks people, events, or information to illuminate and define the properties, boundaries, and relevance of this category or set of categories. (p. 345)

Constant comparative analysis is done throughout and after data collection, by going back and forth between data and analysis with memoing done by the researcher. The coding progression in a grounded theory study is first in vivo (the participants' own key words), then axial (relationships around categories, such as who, what, when, etc.), and finally theoretical (causes, contexts, contingencies, consequences, covariances, and conditions). The theory is often presented visually, such as in the form of a flowchart, to emphasize the process of how the phenomenon being studied happens.

Grounded theory studies probably average the highest number of participants, with expectations commonly ranging from 20-75. This likely happens because grounded theory does attempt at qualitative generalization. Data collection centers on interviews, focus groups, observations, and artifacts, but it can include other sources.

Example Grounded Theory

Karraa, W., & McCaslin, M. (2015). Published: A grounded theory of successful publication for midcareer scholars. *The Qualitative Report*, *20*(8), 1332-1358. https://doi.org/10.46743/2160-3715/2015.2266

Ethnography

Ethnography is a qualitative methodology focused on the study of culture and/or culture-sharing groups. It is typically conducted by an outside researcher who spends a *significant* amount of time embedded within the culture/culture-sharing group (ex., living in particular collegiate fraternity for 4-24 months to study that chapter's culture). This methodology arose out of anthropology, wherein (typically) a Western anthropologist traveled to some hidden village in a jungle to learn about a tribe previously unknown to Western civilization. In recent years, that has made ethnography quite controversial (ex., Wolf, 1992), as it is often cast as colonialistic, Western-centric, exploitative, tokenizing, objectifying, and oppressive in the tradition of the era in which those early anthropological ethnographies were conducted. It is also relevant to note here that primate researchers, such as the famous Dr. Jane Goodall, conducted ethnographies of those primate group cultures. Wolcott (2005) is perhaps the most important methodological source book for modern ethnographers.

In an ethnography, the outside perspective brought by that researcher is referred to as "etic," whereas the insider perspective of those from within the culture/culture-sharing group is referred to as "emic." The goal of the researcher, then, is to get past the etic to communicate the culture from an emic perspective.

Similar to the case study, the number of participants in an ethnography will vary according to the number of people in the culture sharing group. However, the *number* of participants is less relevant in ethnographies, as the unit of focus is *one* (i.e., the group itself, not the individuals). Ethnographic data collection often centers around observations and informal interactions during an extended immersion of the researcher in the culture-sharing group's setting. Because of this, studying in multiple iterations of the group can become impractical and actually represent different sub-cultures (ex., a study on a particular fraternity across multiple chapters might be best suited to studying the sub-culture of a single chapter).

Example Ethnography

Hunter, J. E. (2015). Intersubjective sensibilities: Memory, experience, and meaning in natural history interpretation. *The Qualitative Report*, *20*(7), 1046-1061. https://doi.org/10.46743/2160-3715/2015.2199

Other Qualitative Methodologies

There is not space in this text to expound upon all the options that could be presented on the topic of this chapter. The "major" methodological traditions may be more commonly used, but that does not make them superior to any of these "others." Each fits its own niche for what is being investigated, how it is investigated, what questions can be answered, and how findings are presented. While some of the more common "others" seen are highlighted in this section, readers are encouraged to dig deeper into qualitative methodological literature if they want to know more or find other options.

Arts-Based

Arts-based qualitative research is likely the most varied type of qualitative research, in terms of both methods and representation of the research. For example, an ethnodrama is an amalgamation of qualitative data from, say, interviews that have been re-storied into a dramatic production for the theater. Qualitative poetry, which can be autoethnographic, poetically conveys an experience, and that poetry could span just a single page without any engagement with the literature (ex., Teman, 2016) or be a poem situated as the "Findings" in a traditionally-formatted research article. However, all arts-based qualitative research includes creative, artistic acts as central to the data collection and/or generation, as well as the final representation of research. See Smithbell (2010) for an overview of arts-based qualitative research in the education field.

Example Arts-Based Studies

Cousik, R. (2014). Research in special education: Using a research poem as a guide for relationship building. *The Qualitative Report*, *19*(26), 1-16. https://doi.org/10.46743/2160-3715/2014.1210

O'Connell, N. P., & Lynch, T. (2020). Translating deaf culture: An ethnodrama. *Qualitative Inquiry*, *26*(3-4), 411-421. https://doi.org/10.1177/1077800419843945

Teman, E. D. (2016). Laramie 2.0: The journey of a queer professor. *Qualitative Inquiry, 23*(3), 225-227. https://doi.org/10.1177/1077800416640013

Content Analysis

Content analysis is a qualitative methodology wherein the researcher "systematically examines print and media materials' words and images for their topics, themes, concepts, and ideas" (Saldaña & Omasta, 2018, p. 153). Content analysis can blur the lines between quantitative and qualitative, such as counting frequencies of key words that are determined by qualitative themes.

Content analysis can stand alone as its own study, but it can also be used as an analytic approach nested inside of another methodology. For example, a case study of an organization might generate a significant amount of documents as qualitative data, which then could be subjected to content analysis.

Example Content Analysis Study

Gupta, R., & Pradhan, S. (2017). Evaluating financial planning advertisements for retirement in India: A content analysis. *The Qualitative Report*, *22*(7), 1792-1808. https://doi.org/10.46743/2160-3715/2017.2219

Photovoice

Versey (2024) described photovoice research as "a visual method for interrogating subjective perspectives" (p. 594). In short, photovoice research allows participants to utilize visual media (i.e., photographs they take) to represent their perspectives, which they may then supplement by discussing them. Traditionally, this was done with the researcher and participant co-located and collaborating, but it can be done remotely and virtually (Call-Cummings & Hauber-Özer, 2021).

Example Photovoice Study

Tønnessen, S. H., Ness, O., & Klevan, T. G. (2023). Co-exploring meaning in everyday life for people in mental health recovery: A photovoice study. *The Qualitative Report*, *28*(4), 1070-1095. https://doi.org/10.46743/2160-3715/2023.5782

Combined Methodology

Why have a combined qualitative methodology rather than a "pure" one? Simply put, sometimes the existing boxes are too restrictive to conform to while doing the needed research. To illustrate, phenomenological polyethnography (Olt & Teman, 2019) is a combined qualitative methodology, which blends phenomenology with duoethnography (polyethnography just meaning more than two). Duoethnography itself is a combination of narrative inquiry and ethnography, as "a collaborative research methodology in which two or more researchers of difference juxtapose their life histories to provide multiple understandings of the world. Rather than uncovering the meanings that people give to their lived experiences, duoethnography embraces the belief that meanings can be and often are transformed through the research act" (Norris & Sawyer, 2012, p. 9). In cases where the expert authors also happen to be those who experienced the phenomenon, phenomenology is not possible, as duo/polyethnography puts the focus on the authors and their transformations, not the phenomenon itself. Thus, the combined phenomenological polyethnography adapts the parent

methodologies to focus on a phenomenon through dialogue of a shared experience by the authors.

Example Combined Methodology Studies

Olt, P. A. & Teman, E. D. (2018). A duoethnographic exploration of persistent technological failures in synchronous online education. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research*, *19*(3), Art. 3039. https://doi.org/10.17169/fqs-19.3.3039

Rice, C., Bessey, M., Roosen, K., & Kirkham, A. (2023). Transgressing professional boundaries through fat and disabled embodiments. *Canadian Woman Studies Les Cahiers De La Femme*, *35*(1,2), 51-61. https://cws.journals.yorku.ca/index.php/cws/article/view/37866

Key Takeaways

1. Qualitative research methodologies are rapidly emerging and evolving.
2. Qualitative methodologies provide a framework for designing qualitative studies, collecting and analyzing qualitative data, and presenting findings.
3. Because a methodology connects what is being done to what has previously been recognized, having a defined methodology in a qualitative study can significantly enhance the perceived strength of the study.

Open Qualitative Methodological Journals

The two journals below are open-access sources of peer-reviewed qualitative research and methods. They are excellent sources to find qualitative methodological guides, nuances, and considerations.

The Qualitative Report (https://nsuworks.nova.edu/tqr/)

Forum: Qualitative Social Research (https://www.qualitative-research.net/index.php/fqs)

Chapter References

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11

QUALITATIVE DATA ANALYSIS

Phillip Olt

Definitions of Key Terms

- Category: A synthesis of codes that creates a consolidated meaning from them
- Code: "Most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldaña, 2016, p. 4)
- Methodologist: Someone who specializes in a type of research methodology
- QDA: Qualitative Data Analysis
- Rich, Thick Description: Qualitative writing that presents the findings of a particular study to convey understanding in both breadth and experiential detail as situated within the participant(s) and site(s)
- Theme: "An extended phrase or sentence that identifies what a unit of data is about and/or what it means" (Saldaña, 2016, p. 199).
- Transcribe: To create a verbatim textual rendering of data originally created in audio
- Trustworthiness: An approach to evaluating the quality of qualitative research based on the "integrity of the data, balance between reflexivity and subjectivity, and clear communication of findings" (Williams & Morrow, 2009, p. 577).

Qualitative Data Analysis (QDA) is perhaps the area with the most fundamental difference compared to quantitative research. QDA is often extremely time-consuming, subjective, variable, and—perhaps—frustrating. This is quite the opposite of the stereotype of quantitative analysis, which involves importing raw data into a program,

selecting the tests you want it to use, clicking "Run," waiting 2 minutes, and exporting the tables into your manuscript.

QDA as Refinement

The purpose in QDA is to answer your research question(s). Saldaña (2016) discussed this inductive process as coding → categorizing → themeing (p. 14), which is going from small (codes qualifying the data) to medium (categories essentially coding the codes) to large (the general themes that described major divisions of the categories). In that approach then, those themes should be the answers to your research question(s).

It is easy for novice and expert qualitative researchers alike to get distracted during QDA. Perhaps you asked a research question about one thing, but as you become immersed in data collection and analysis, you find something not directly related but really interesting. At this point, you have a couple options:

1. Drop the rabbit trail and go back to analyzing for your original research question(s). Finish this study.
2. If you see enough of something that seems significantly important, you can add a research question to the initial study to answer from these data (especially if closely associated), or you might spin the new research question(s) into a new study out of the same original data. Your original research question(s) and study might be completed or abandoned at the discretion of the researcher.

How should one do QDA?

Some questions to consider:

1. What methodology are you using? Certain qualitative methodologies (most notably, grounded theory) have well-defined expectations for QDA.
2. What type of data do you have? For example, visual data (such as young children's paintings depicting the emotion they feel when taking a test) will be analyzed quite differently than the transcript of an interview.
3. What makes the most sense for your study, as determined by you the researcher?

One of the unsettling things for new (and sometimes veteran) qualitative researchers is the reality that there usually is not a single "right" answer of how to do QDA. There is not a checklist of how to correctly do a qualitative study. You, as the expert, get to make reasoned selections, which you should be able to defend and justify (usually from methodological literature). Then, in any peer review process, you have to mentally prepare yourself for editors and/or reviewers who have very different opinions on how

they think it should have been done. What makes this particularly difficult in qualitative research is that, normally, both perspectives are equally fine, just matters of preference or opinion.

Below, I will detail one common, major approach to doing QDA: Saldaña's (2016) coding → categorizing → themeing. That is not the only way to do things, nor is it necessarily a right way to do QDA in a particular study. Students wanting to learn more should engage with Tier 2 or 3 qualitative texts/courses.

Coding

Saldaña (2016) defined a qualitative code as, "most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (p. 4). Coding, then, is the process of developing and assigning those codes. There is an incredible variety of coding approaches, which is well beyond the scope of this course. One of the most straightforward methods is "in vivo coding," which uses the participant's own words as codes. Consider the example below:

- Interview Excerpt: I can remember feeling like I was starving during my morning classes before lunch, since my parents couldn't really afford breakfast.
- In vivo Code: STARVING

While in vivo coding is great for extracting the most important points, it normally needs a second round coding process to construct meaning. That might involve grouping codes of similar ideas (starving, super hungry, no food, etc.), similar chronology (morning hunger, lunchtime hunger, evening hunger), and/or other relevant similarities appropriate to the specific study.

Miles et al. (2014) also noted the importance of clearly defining codes so that the researcher and any members of a research team will consistently apply them. This is important as a frame of reference even for a single researcher; however, I have found it indispensable when collaborating with others. What seems obvious and/or intuitive to one person may not be to another (or obvious in a completely different way). Not doing so commonly leads to significant frustrations during the analysis and interpretation process.

Categorizing

Saldaña (2016) described the refinement from codes to categories as "synthesis" that does not reduce content but rather creates "consolidated meaning" (p. 10). In a sense,

this is grouping codes, but really it is more than that, in much the same way a car is more than the sum of its parts.

Themeing

The ideas of theme, themeing, and thematic analysis might be the most used and abused terms in QDA and even qualitative research more broadly. Saldaña (2016) described a theme as something that "can be an outcome of coding, categorization, or analytic reflection, but it is not something that is, in itself, coded" (p. 15). Themes of the data, which are often represented as sub-headings underneath the "Findings" Level 1 Heading, generally "emerge from analysis" (p. 16). A theme, then, is, "an extended phrase or sentence that identifies what a unit of data is about and/or what it means" (p. 199). Lochmiller (2021) also provides an excellent overview and nuts-and-bolts details for thematic analysis.

Summary

As mentioned above, I often conceptualize the entire QDA process by focusing on the research question(s) of the study. The purpose of things like coding and thematic analysis are to answer the research question(s) from the data. At the end of writing up a qualitative study, I ask myself, "If I form these themes, that are headings in my Findings section, into a single compound sentence, does that sentence directly answer my research question(s)?" Or, maybe more simply, if someone directly asked me my research question and I responded by explaining my theme(s), would that be a good answer? If there's a "well, that doesn't cover X" thought in my mind, I consider if I did omit something important. If parts of my Findings themes do not respond directly to the research question and/or seem extraneous, I consider if I should remove or combine them.

In my pre-pandemic phenomenological study on synchronous online education, I asked this research question: "What is the academic experience like for freshmen doing their first year of college through synchronous online education in classes blended with face-to-face students" (Olt, 2018, p. 382)? To that, I had the following themes in my Findings:

- Ambiguity about Group Membership
- Ambiguity about Functionality
- Ambiguity about Place

So, if we frame this like a conversation (which it is, in practice, between the author and readers), it might look like this:

- Question: What is the academic experience like for freshmen doing their first

year of college through synchronous online education in classes blended with face-to-face students?

- Answer: It's ambiguous for the remote students, as they struggle to see where they fit in with regard to group membership as students in the class, whether the technology will work properly on any given day, and what place they actually exist in as students (physically in their remote location but virtually on a screen in a distant classroom).

Transcription

While there are many qualitative data sources from pictures to legal documents, the most common qualitative data sources are interviews, whether individual or in focus groups. These interviews are generally recorded by the researcher. However, how does one analyze 60 minutes of audio recording? Qualitative data of this sort first has to be transcribed from an audio format into a usable text document.

One popular way for researchers to convert audio data to text is to outsource that work. For a professor in a well-supported research position, that might come in the form of a graduate assistant. Other times, one might use an outside service, such as Rev (https://www.rev.com/). Both of these come with costs; however, more significantly, there may be ethical concerns. Perhaps a graduate assistant might get approved by the Institutional Review Board to have access to the data as part of a research team; however, there is no real oversight of an outside service. Individual transcriptionists working for the outside service are not known by the institution. While their company might swear them to confidentiality, researchers should take great care in using these outside services. Clarify any intended use in an Institutional Review Board application, and one should not even consider such a service with especially sensitive topics (ex., where there are potential criminal or social consequences associated with interview content). In either case, there is still a transcriptionist manually converting speech to text.

Ultimately, the only way to assure quality and confidentiality of transcription is via the direct efforts of the researcher. That is not to imply that tools to support that effort do not exist, such as Otter.Ai (https://otter.ai/) that is also available embedded with Zoom Pro accounts. Such tools might provide an AI-generated preliminary transcript, which the researcher then should manually compare to the audio recording and correct as needed. Make sure to check the privacy policies of AI programs used with transcripts, as some companies use the data input by users to train their models and could spit out your data in response to a query by another user. As the researcher transcribes, they might play the audio at a slower speed and keep pace typing in a word processing program. Foot pedals connected to the computer have been a popular device to allow

the researcher doing transcription to automatically rewind a predetermined number of seconds (should the researcher have difficulty understanding what was said, need to confirm, or just generally fall behind).

QDA Tools

This section will provide some historical context for the development of QDA tools and end in the present with software and AI. It is important to remember though that newer QDA tools are not actually better in substance; they do the exact same things as were done before. Different tools may just be more or less efficient and have utility with digital data. All of these tools can get a qualitative project to a full and complete end state; ultimately, what is "best" is a qualitative question with a variety of subjective answers based on personal preferences.

A Printer, Scissors, and Highlighters of Many Colors

Before the advent of tools to do QDA inside a computing device, QDA was often done with typed transcripts that were physically highlighted in different colors (representing different codes/themes) and physically cut up to be sorted into piles. This system relied on successive iterations of total readings with any undoing of QDA representing a total and massive undertaking. Even before the personal computer, this level of QDA tools might include handwritten text and typewriters.

This method is not without its challenges. A colleague once told me about a time they had dozens of pages carefully laid out, highlighted, and cut up across their office floor. They came back in after a weekend, and the custodian had visited their office. While things had not been disposed of, they had been totally scattered from their order and categorization, effectively throwing away hours and hours of researcher work.

Word Processing and Spreadsheet Software

With the advent of the personal computer, software soon became available that could be used to assist with QDA, which certainly overlapped much of the print/highlight/cut era of QDA tools. While not designed specifically for QDA, word processing (Microsoft Word, Google Sheets, etc.) and spreadsheet (Microsoft Excel, Google Sheets, etc.) applications provided a degree of ease to QDA. Word processing applications allowed the user to digitally highlight with a variety of colors, search documents with ease using the Ctrl+F function, make changes to QDA relatively easily, and consolidate data. Spreadsheets could do much of the same functions; however, they were/are more commonly used to digitally organize excerpts of qualitative data in columns devoted to

tags for coding, categorizing, and themeing. These could then be easily filtered to view organized data sets.

These tools are still very common in QDA. Almost all qualitative projects involve some data inside of a word processing application, though there could be anywhere from zero to all of the QDA done inside of it. Again though, these tools were not designed specifically for QDA, and so software programs designed specifically for that were eventually developed and came into wide usage.

Because of the ubiquity of word processing and spreadsheet applications (free or already owned for other basic uses), this approach is still relatively common, especially for small projects or working with succinct data (such as qualitative survey responses that are manageably short). Indeed, it may even be better for those small QDA endeavors without the additional setup needed for projects in QDA software.

QDA Software

Emerging out of the need for software specifically designed for QDA, there has been an explosion of products. There are products that seek to provide a streamlined, lite tool (ex., Dedoose), while others try to provide all the bells-and-whistles possible to cover every QDA need (ex., NVivo). Preferences on QDA software can become somewhat tribalistic among qualitative methodologists, but outside of less common QDA needs, they all provide essentially the same functionality. It is really a matter of familiarity and preference, though financial considerations are also often of great practical importance for those outside of well-funded departments.

It is, however, very important that the qualitative researcher remember that these are just tools, only as effective as the artisan who wields them. This is quite different than quantitative analysis tools, which generally do all the heavy lifting for the researcher upon being given data and instructions.

Using AI in QDA

The use of artificial intelligence (AI) in QDA is, at the time of this writing (fall 2024), quite controversial. Since the introduction of software programs for QDA, there has been a built-in way for technology to "do" some of the QDA, such as counting frequencies of words. QDA software then might return a word cloud weighted by frequency. However, that word cloud must be taken with a degree of skepticism, as programs could only find exact matches (missing different words that conveyed the same meaning), emotional impact, and context.

So, is AI better at QDA or is that superficial with it just being more of the same? This

is a qualitative question with a qualitative answer that is both subjective and complex. AI *is* better at things like finding patterns than the former algorithms built into QDA software. It can even be trained specifically on QDA texts to generate themes with rich, thick description. One such example is Moxie Learn AI out of the Academic Insights Lab (https://moxielearn.ai/), while an increasing number of the QDA software systems include AI assistants, such as MAXQDA's AI Assist (https://www.maxqda.com/products/ai-assist). However, AI does still struggle with understanding context, impact, and human meaning (especially when participants describe things very differently but yet have a common meaning).

The use of AI for *qualitative* research is a bit ironic, as AI is fundamentally quantitative. It only appears qualitative on its outputs while actually using incredibly refined and complex quantitative analysis to make predictions about words. So, if one uses AI in QDA, does that then blur the lines between quantitative and qualitative, effectively doing quantitative analysis on qualitative data (which is a thing even beyond AI)? That does, in fact, seem to be the case, even though it may not feel that way seeing AI's outputs.

Gillen (2024) asked the question, "Can we trust AI in qualitative research?" He concluded that it could have some useful applications, but overall, he concluded that it was not advisable for large-scale implementation. There are risks of hallucination, errant quantitative prediction of qualitative ideas, and bias that cannot be filtered through researcher positionality. However, Gillen's concerns about security are significant. Should an AI gain access to data before anonymization, all ethical and confidentiality protections could be lost with no way to resolved. Even with anonymized data sets (ex., interview transcripts), AI could potentially use that information to match to real-world people, which whether those matches were right or wrong could create significant negative impacts. Practically, Gillen concluded that, "it should be applied cautiously in its current form" to do "supplementary tasks" (para. 12). Waxing more philosophical than practical, Gillen argued that "much like art, qualitative research can be a celebration of humanity" and "to study humans, particularly in an open and interpretative way, requires a human touch" (para. 14).

AI is rapidly evolving, as its use in QDA. As Christou (2025) noted, "AI's impact on qualitative research is particularly profound" (p. 3309), and I recommend Christou as further reading on the role of AI in the quality of QDA. Much like Gillen, I agree it could have practical uses even in QDA. However, I do not believe it is wise to let AI tell the story of humanity. Qualitative research fundamentally tells non-fiction stories, and we as humans should do that for ourselves.

[Editor's Note: Because of how rapidly AI is evolving, this section may be regularly updated without a new edition of the book in order to keep it current and accurate.]

Reporting Results of QDA

The current American Psychological Association (2019) manual provides an extensive description of how a qualitative study should be written (pp. 93-105). However, it is important to note that there are differing disciplinary, methodological, departmental (thesis/dissertation), and journal expectations from the APA. Beyond structural elements, I provide some guidance below on four important areas of consideration in writing up qualitative research.

Rich, Thick Description

Merriam and Tisdell (2016) described rich, thick description as, "providing enough description to contextualize the study such that readers will be able to determine the extent to which their situations match the research context and, hence, whether findings can be transferred" (p. 259). I do think that definition conveys part of the essence of what "rich, thick description" is, but it is focused on external transference rather than conveying findings. Saldaña and Omasta (2018) noted that it "does not imply lengthy narratives but a written interpretation of the nuances, complexity, and significance of a people's actions. By focusing on the details of what we experientially witness, we can reflect on and hopefully render an account that provides insightful knowledge for readers" (p. 31). Synthesizing these ideas, I hold rich, thick description to be qualitative writing that presents the findings of a particular study to convey understanding in both breadth and experiential detail as situated within the participant(s) and site(s) .

This is usually accomplished in a qualitative study by effectively balancing the direct presentation of qualitative data with researcher analysis. synthesis, and explanation. The Findings section of a qualitative study should be rich in qualitative data, such as quotes from interviews. Directly presenting such excerpts helps readers see researcher bias in analysis or interpretation, make judgments about the findings directly, and find trustworthiness in the qualitative account. Of course, participant confidentiality must be protected in this process, but participant quotes humanize the Findings narrative.

However, the researcher also must be careful not to overwhelm the Findings section with qualitative data. A good approach to an "average" qualitative study (whatever that is) would be to have one to two exemplars of qualitative data per heading of any level. These should be carefully selected to illustrate the point being made, and each should make a unique contribution to that understanding. If one quote conveys that essence entirely, it is generally unnecessary to include two; however, if for example, there is a divergence of opinions among participants, two quotes might be used to illustrate that divergence. Excerpted quotation lengths should be no longer than they need to be to convey the necessary content, but they should not be shortened artificially. It is common

that these quotations would be 20-50 words in length. The researcher should not, however, *just* drop participant quotes under headings and feel as if they have conveyed the findings of the study. They should discuss and explain key components from each quote within the context of the synthesis explanation of that heading.

Qualitative Theses and Dissertations

Before embarking on the journey of writing a thesis or dissertation, one should make sure their plan is approved by their chair. If the chair is not a qualitative-focused researcher, I recommend that the student add a qualitative methodologist on their committee as a protection against methodological ignorance or bias, which is unfortunately not uncommon in segments of the social science world. As additional committee members are selected, I recommend looking for those with at least some publication history that is qualitative.

Finding a Journal

At the forefront of most decisions in selecting a journal to submit a manuscript is usually the content. For discipline-specific journals, this is relatively obvious—submitting a political science paper to an economics journal is likely a waste of time (though not always). Often, research-intensive institutions and departments will give greatest priority to those disciplinary journals. However, there are also journals that are methodologically focused, such as *The Qualitative Report*, which are also ranked highly.

Additionally, there are methodological considerations. Some social science journals are specific to certain methodological approaches (ex., quantitative only), and so it is important to make sure from the journal's aim and scope that it accepts qualitative works. However, it is unfortunately also not uncommon for a journal to say that it is methodologically open but not practice that. This could be because of the current editor's preferences or something more systemic, but it is advisable for qualitative researchers to look at the last two years of publication history at a journal before submitting to make sure there are qualitative pieces being published. Submitting to either dead end can be extremely frustrating and time-wasting for the qualitative researcher.

Those Pesky Word Count Maximums

Perhaps the most frustrating thing about being a qualitative researcher are the word count maximums set by a journal. There may be nothing more deflating than finding a "perfect" disciplinary fit, only to see there is a maximum allowable word count of 5,000. A low word count allowance (say, 6,000 or less) is often a strong sign of quantitative

bias at the journal. However, with required introduction, literature review, discussion, and references content, low word count requirements can be very difficult for many qualitative pieces to meet without compromising quality (i.e., rich, thick description). There are also usually expectations for far longer methodology sections in qualitative pieces than quantitative, which takes up even more of the allowable word count.

It is reasonable to understand why word count minimums came into existence. In the era when all journals were in print rather than digital, more words meant more cost to print and ship. Additionally, this provides a protection for reviewers and editors in how much time will be spent reviewing. However, good reports of qualitative social research take significantly more space than quantitative reports. Rich, thick description will not be had with <1,000 words for a Findings section.

Key Takeaways

1. QDA is a slow, iterative process requiring a significant amount of time and effort from researchers.
2. QDA is variable and subjective to the researcher's discretion, but it should be consistent with methodological literature.
3. QDA tools enhance the analysis and interpretation process of qualitative research, but they do not replace it or do it independently.
4. Good reports of qualitative research balance qualitative data and researcher analysis/interpretation in rich, thick description.

Additional Resources

Methodological Journals

The two journals below are open-access sources of peer-reviewed qualitative research and methods. They are excellent sources to find qualitative methodological guides, nuances, and considerations.

The Qualitative Report (https://nsuworks.nova.edu/tqr/)

Forum: Qualitative Social Research (https://www.qualitative-research.net/index.php/fqs)

Transcription Tools

Otter.Ai (https://otter.ai/)

Rev (https://www.rev.com/)

Qualitative Data Analysis Software [Note: Many of these now include supplemental AI tools.]

Atlas.ti (https://atlasti.com/)

Dedoose (https://www.dedoose.com/)

HyperRESEARCH (http://www.researchware.com/products/hyperresearch.html)

MAXQDA (https://www.maxqda.com/)

NVivo (https://lumivero.com/products/nvivo/)

Quirkos (https://www.quirkos.com/)

Taguette (https://www.taguette.org/) – *free*

QDA AI

MAXQDA AI Assist (https://www.maxqda.com/products/ai-assist)

Moxie Learn AI (https://moxielearn.ai)

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12

MULTIPLE AND MIXED METHODS RESEARCH

Elliot Isom

Definitions of Key Terms

- Constructivism: A paradigm asserting that, whether objective truth exists or does not, it is only understood by humans as we construct it, which is driven by prior knowledge and social discourse.
- Cross-Cultural MMR: A growing application of MMR that balances standardized quantitative measures with culturally specific qualitative insights.
- Data Integration: The process of combining qualitative and quantitative data in MMR studies to ensure coherence and alignment in research findings.
- Interpretivism: A research paradigm which asserts that reality is socially constructed and cannot be understood through purely objective measurements (as would be common in positivist research).
- Mixed Methods Research (MMR): A distinct research methodology that intentionally integrates qualitative and quantitative approaches within a single study to provide a comprehensive understanding of a research question (Creswell & Plano-Clark, 2018).
- Multiple Methods Research: A research approach that involves using more than one method of data collection or analysis within the same broad category (either qualitative or quantitative). Multiple Methods Research remains within a single methodological tradition, such as using different qualitative techniques (e.g., interviews and focus groups) or multiple quantitative approaches (e.g., surveys and experiments) without integrating both. (Tashakkori & Teddlie, 2010).
- Positivism: A research paradigm that believes objective truth exists and is knowable through (and only through) scientific methods.

- Post-Positivism: A research paradigm that acknowledges objective truth exists in a single reality but acknowledges the limitations of measurement and objectivity, allowing for some engagement between the researcher and participants.
- Pragmatism: The underlying philosophical foundation of MMR, advocating for the selection of research methods based on what works best to address a research question rather than strict adherence to a single paradigm.
- Reflexivity: The process of researchers critically examining their influence on the study, acknowledging biases, and ensuring credibility in qualitative and mixed methods research.
- Triangulation: A method in MMR where different data sources or analytical approaches are used to validate findings and enhance research reliability.
- Validity (*in Multiple and Mixed Methods Research*): The process of ensuring credibility and accuracy in findings through techniques such as convergence of results and method triangulation.

Mixed methods research has steadily gained traction in the social sciences for providing a comprehensive perspective on complex phenomena (Creswell & Plano Clark, 2018; Tashakkori & Teddlie, 2010). By integrating quantitative and qualitative approaches, researchers can glean both numerical breadth and contextual depth, offering a fuller understanding of how interventions, policies, or environmental factors impact learning and well-being (Johnson & Onwuegbuzie, 2004; Mertens, 2015). Over time, early proponents recognized that the synergy between these distinct paradigms unlocks deeper insights than either method alone (Creswell & Plano Clark, 2018).

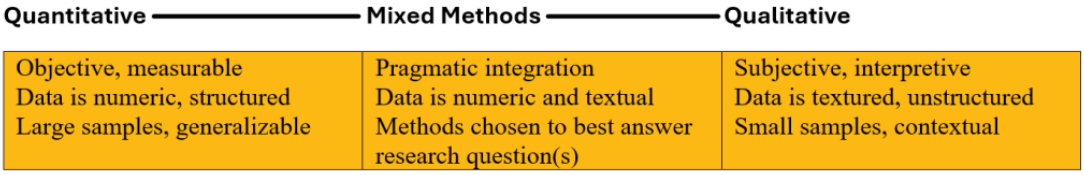
This chapter introduces the philosophical foundations and major designs of mixed methods research, culminating with practical recommendations for ethically and effectively implementing designs in real-world settings. With these tools, emerging scholars can fully harness the potential of mixed methods to address the nuanced realities they face in their work.

Overview

Mixed Methods Research (MMR)

Mixed methods research (MMR) is a distinct research methodology that intentionally integrates both qualitative and quantitative approaches within a single study to provide a comprehensive understanding of a research question (Creswell & Plano-Clark, 2018). Unlike multiple methods research, which employs different methods within the same paradigm (e.g., multiple qualitative or multiple quantitative methods), MMR strategically combines qualitative and quantitative data collection and analysis to leverage the strengths of both approaches (Fetters & Freshwater, 2015). The MMR process involves collecting, analyzing, interpreting and reporting data in typical fashion.

However, the data involves both qualitative and quantitative evidence to answer the research questions (Dawadi et al., 2021). Much like other methods that are employed to research common themes, MMR was developed to address new emergent topics in the social sciences. Researchers using MMR have arrived at the conclusion that such an approach represents the best possible methodology to address the research problem.



The Continuum of Research Designs from Quantitative to MMR to Qualitative

History

The development of MMR designs is attached to and follows the progression of new research paradigms—a philosophical underpinning for beliefs surrounding the use and interpretation of research. For example, quantitative research methods commonly follow the idea of positivism in research, which believes truths can only be understood through interpreting numerical data. Interpretivism, in contrast, believes in multiple realities and the researcher can only gain an understanding through qualitative data, but the outcome is non-conclusive. Post-positivism follows the same principles, yet allows for more engagement between the researcher and participants. Post-positivistic researchers value the objectivity of the process (quantitative data), while acknowledging the value of the subjective experience (qualitative data) potentially adding another layer of understanding to the research outcome. If we combine our perspectives with objective (positivism) and subjective (interpretivism), the hope is to give new answers to research questions.

Why Use Mixed Methods?

As a researcher that uses an MMR design, you are acknowledging the value of both the positivism and interpretivism research paradigms. However, it is important to understand that, even though MMR covers a broader context of research, it may not always be the most productive strategy to use in a research endeavor. Therefore, it falls on the principal investigator to determine whether MMR is the best approach to design a study or would other approaches be more efficient. Given the determination to use MMR, the approach represents the most effective methodology to gain insight into a researched problem from multiple perspectives. MMR creates the conditions to expand studies, offering broader conclusions in areas that were otherwise devoid of

new directions. The outcomes of MMR studies offer a greater breadth of conclusions, helping researchers to develop a more holistic picture of a particular phenomenon.

Dawadi et al. (2021) identified six major justifications for combining qualitative and quantitative methods for a research study:

1. *Expansion:* Mixing qualitative and quantitative approaches broadens the scope of a study, providing both depth (through narratives and interviews) and breadth (through numerical data) to foster robust generalizations and nuanced insights (Creswell, 2003).
2. *Complementarity:* Employing both methods acknowledges the distinct value each brings, producing synergy and reinforcing conclusions by enabling greater certainty and wider implications (Maxwell, 2016; Morgan, 2014).
3. *Combining Philosophies:* Integrating the two paradigms bridges epistemological divides and offers a more complete, contextually rich understanding of a phenomenon, thereby opening avenues for deeper reflection and future inquiries (Tashakkori 2009; Lund, 2012).
4. *Offsetting Weaknesses:* By leveraging the strengths of one approach to compensate for the limitations of the other, mixed methods research increases methodological rigor and accuracy in conclusions (Ivankova & Plano Clark, 2018).
5. *Enhanced Validity:* Converging results from different data sources enriches the validation process, leading to more credible findings and enhancing the reliability of interpretations (Tashakkori 2009; Teddlie & Tashakkori, 2009).
6. *Method Development:* A sequential MMR design allows researchers to refine and shape the second method based on initial results, creating more targeted and meaningful follow-up investigations (Ivankova & Plano Clark, 2018).

While mixed methodologies can be more time consuming and complex, they afford researchers more developed opportunities to explore a research topic. Additionally, research conducted under an MMR framework offers the prospect to better validate outcomes, presenting more credibility to research in the social science fields.

Multiple Methods Research

While Mixed Methods Research (MMR) integrates both qualitative and quantitative approaches within a single study, "multiple methods research" refers to the use of more than one method within the same methodological tradition—either qualitative or quantitative. This approach allows researchers to explore a research problem more comprehensively by leveraging different data collection and analysis techniques within a single paradigm (Tashakkori & Teddlie, 2010).

Characteristics of Multiple Methods Research

1. *Within-Paradigm Application:* Unlike MMR, which blends qualitative and quantitative methodologies, multiple methods research remains entirely within a single research paradigm (e.g., exclusively qualitative or quantitative).
2. *Diverse Data Collection Techniques:* Researchers may employ multiple qualitative methods (e.g., interviews, ethnographic observations, and focus groups) or multiple quantitative approaches (e.g., surveys, experiments, and secondary data analysis) to gain deeper insights.
3. *Enhanced Rigor and Reliability:* Using multiple methods within the same paradigm helps strengthen the credibility of findings by allowing methodological triangulation—comparing different data sources or analytical approaches to validate results (Flick, 2018).
4. *Sequential or Parallel Implementation:* Similar to MMR, multiple methods research can be conducted in sequential (where one method informs the next) or parallel (where methods are applied simultaneously) designs (Creswell & Plano Clark, 2018).

Distinguishing *Multiple* Methods Research from *Mixed* Methods Research

A common misconception is that multiple methods research and mixed methods research are interchangeable. The primary distinction lies in the integration of data. Multiple Methods Research does not integrate qualitative and quantitative methods but rather employs different techniques within the same methodological framework. In contrast, mixed methods explicitly combines qualitative and quantitative data to enhance the breadth and depth of findings (Tashakkori & Creswell, 2007).

Multiple methods research provides a valuable approach for deepening methodological rigor and broadening the scope of inquiry within either qualitative or quantitative traditions. However, researchers must ensure they select the appropriate methodological framework to align with their study's objectives. Understanding the differences between multiple methods research and mixed methods research is crucial for researchers aiming to apply the most effective strategy for their research questions.

Philosophical and Theoretical Foundations

Doing What Works

The pragmatism that underpins mixed methodology describes the intent to find whatever works to gain understanding of the phenomenon. As we'll see in the next section there are many common designs for constructing mixed methods studies. These

designs seek to blend quantitative and qualitative using different dimensions and longitudinal factors that incorporate the strategies found in other research methodologies.

Paradigm	*View of Reality*	*Interpretation of Data*	*Research Implications*	*Primary Research Methodology*
Post-positivism	One reality, imperfect understanding	Objective, measurable	Structured designs; focus on validity and reliability	Quantitative
Constructivism	Multiple realities; socially constructed understanding	Subjective, co-created knowledge	Flexible, focused on participant's context	Qualitative
Pragmatism	Reality as both singular and multiple; understanding depends on the inquiry	Produced through practical and applied means	Chosen based on "what works"; utilizes multiple data forms	MMR

Research Designs

Common Mixed Methods Designs

While MMR designs have shown flexibility to create conditions for "what works" depending on the context of the study, recent literature has demonstrated a push to find a standardized approach to MMR designs. Historically, however, there have been a number of trending designs that are dependent upon the research case rather than one design to fit any study. Rather than describe a singular design to conduct an MMR study, this text seeks to present you with multiple design styles to help you discern the use of MMR in any research study. It is important to understand that data in an MMR design works conjunctively rather than separately to create a holistic outcome.

Design	*Description*	*Strengths*	*Challenges*	*Example*
Convergent Parallel Design	Collects quantitative and qualitative data concurrently; analyzes separately and integrates findings to compare for convergence or divergence	Efficient in time-limited settings; allows for cross-validation of data	Difficult to resolve discrepancies between data types; requires expertise in both methods	Studying the impact of mindfulness on student anxiety using surveys and focus groups conducted simultaneously
Explanatory Sequential Design	Begins with quantitative data collection and analysis, followed by qualitative research to explain quantitative results	Clarifies statistical trends with rich qualitative insights	Time-consuming; requires participant commitment for follow-up studies	Evaluating Cognitive Behavioral Therapy (CBT) effectiveness using depression scales followed by interviews with participants
Exploratory Sequential Design	Starts with qualitative data collection to explore a phenomenon, followed by quantitative data to generalize findings	Explores new topics deeply before confirming generalizability	Longer research timeline; requires expertise in qualitative analysis	Exploring teacher strategies for student motivation via interviews, then developing a survey to assess usage across schools
Embedded Design	One type of data (qualitative or quantitative) serves as the primary method, with the other embedded to support the main findings	Provides additional context and depth to dominant data type	Risk of imbalance if embedded data is not well integrated	Assessing Social/Emotional Learning (SEL) programs by using discipline records and standardized tests, with embedded teacher/student interviews
Multiphase Design	Data collection occurs in multiple phases over time, using different data types to build upon prior findings for a comprehensive understanding	Captures long-term changes and complex relationships over time	Requires significant planning; logistical challenges in multi-phase data collection	Studying student behavior changes over multiple years using various data collection methods at different phases

Transformative and Participatory Design	Focuses on social justice, co-designing research with participants, and addressing power dynamics in vulnerable populations	Empowers participants and facilitates actionable social change	Limited standardization; ethical concerns and potential mistrust among participants	Examining student-led mental health initiatives where students co-design programs and contribute to data collection and analysis

Common Multiple Methods Designs

Multiple methods research involves the use of two or more research methods within a single study to provide a more comprehensive understanding of a research question. Unlike mixed methods research, which integrates both qualitative and quantitative approaches, multiple methods research often employs methods within the same paradigm (either qualitative or quantitative) but in distinct ways. These designs help researchers validate findings, enhance reliability, and offer multiple perspectives on a phenomenon. The table below outlines several common multiple methods research designs, highlighting their descriptions, strengths, weaknesses, and real-world applications.

Design	*Description*	*Strengths*	*Challenges*	*Example*
Sequential Qualitative	Researchers use one qualitative method first (e.g., interviews), then follow up with another (e.g., focus groups) to refine or expand findings	Provides depth and allows for refining themes before final conclusions	Time-consuming and may require re-evaluating earlier findings	A study first conducts individual interviews to explore patient experiences, followed by focus groups to refine common themes
Sequential Quantitative	A study begins with one quantitative method (e.g., surveys) and follows up with another (e.g., experiments) for further validation	Strengthens generalizability and ensures statistical robustness	Risk of initial survey biases affecting subsequent data collection	A survey measures attitudes about online learning, followed by an experiment testing students' engagement with different learning formats
Parallel Qualitative	Two or more qualitative methods are conducted simultaneously but analyzed separately to provide multiple perspectives on the same phenomenon	Enhances credibility by triangulating data from different sources	Requires careful alignment of methods and theoretical consistency	A study uses ethnographic observations and in-depth interviews simultaneously to examine workplace culture
Parallel Quantitative	Two or more quantitative methods (e.g., experiments and secondary data analysis) are conducted simultaneously and analyzed separately	Increases validity by comparing multiple data sources and strengthens reliability	Managing large datasets and ensuring comparability can be challenging	An experiment examines customer behavior in an online store, while sales data analysis evaluates purchasing trends
Embedded Qualitative	A primary qualitative method is supplemented with another qualitative technique to provide deeper contextual understanding	Provides rich insight into experiences and enhances interpretive depth	Risk of overcomplicating the analysis if findings conflict	A case study on teacher burnout includes document analysis of teacher journals to provide additional context

Embedded Quantitative	A primary quantitative study is supplemented with an additional quantitative method for contextualization or deeper insight	Strengthens statistical findings with additional layers of data	Requires a well-structured research design to avoid redundancy	A randomized controlled trial on medication effectiveness is supplemented with health records analysis to assess real-world impact

Planning a Mixed Methods Study

There are several considerations researchers must make before deciding whether a study would be appropriate for a mixed methods design. First, it would behoove a researcher to determine what the purpose of the study is and, if wanting to use a mixed methods design, what is it about the study that would be *mixed*? An important caveat to decide upon an MMR design is wanting to provide a holistic understanding of a phenomenon for which current research is inconclusive and/or disjointed (Venkatesh et al., 2016). If moving forward with an MMR design, the areas below inform the considerations needed to plan an MMR study (derived from Kajamaa et al., 2020):

Question to be asked in planning	***Explanation and prompts***
What is the overarching aim of the study?	Mixed-methods studies, by definition, are often designed with a specific aim that can guide the final study design: discuss with the research team whether the overarching aim is theory building (explaining, exploring or describing phenomena) or hypothesis testing.
Which is the dominant method?	In some mixed-methods studies the methods are equally weighted but often they are not. It is worth making this explicit. Nested or embedded designs refer to where there is a smaller data set collected within a larger study for a specific purpose.
Is the data collection sequential, in parallel or convergent?	Research designs may be described as sequential (one after the other), in parallel (happening concurrently but separately, with integration occurring later) or convergent (happening concurrently and with the data sets interacting).
At what stage does the integration of the two methods occur?	It is important to be clear about whether, when, to what extent and how integration was achieved in the methodology section of the study.
Is the qualitative element explanatory or exploratory?	The qualitative element of the mixed-methods research may have a range of different purposes, such as explaining previous findings or exploring a phenomenon.

Formulating Research Questions

One of the advantages of MMR designs is its' ability to allow researchers to craft explanatory research questions, which are important to be able to make inferences rather than just observations. Inferences are important to gain an understanding of a phenomenon versus an objective observation.

Venkatesh et al. (2016) identified four possible dimensions to MMR questions in design: 1. Rhetorical Style—Format: Questions, Aims, and/or Hypotheses – This dimension refers to the way research questions are structured and presented within a study, 2. Rhetorical Style—Level of Integration – This refers to how closely the qualitative and quantitative research questions are connected within a mixed methods study, 3. The Relationship of Questions to Other Questions: Independent or Dependent – This dimension focuses on whether research questions stand alone or are interrelated within a study. Which could be either independent questions (questions do not rely on each other and investigate separate but related aspects of a phenomenon) or dependent questions (Research questions are linked, meaning that one question depends on another for context or explanation), and 4. The Relationship of Questions to the Research Process: Predetermined (Established at the beginning of the study and remain unchanged) or Emergent (Developed during the research process, particularly in qualitative or flexible mixed methods designs. These questions adapt based on initial findings).

Sampling Strategies

In mixed methods research, sampling strategies vary depending on the data type. Purposeful sampling is commonly used in qualitative research, allowing researchers to select participants based on their ability to provide rich, in-depth information about the phenomenon under study (Creswell & Plano Clark, 2018). In contrast, quantitative research often relies on probability sampling techniques, such as random sampling, to ensure a representative and generalizable sample (Teddlie & Yu, 2007). Mixed methods research integrates multiple sampling methods, such as selecting survey participants randomly for generalizability while purposefully choosing interview participants for depth (Ivankova & Plano Clark, 2016).

Data Collection Procedures

Data collection procedures involve both quantitative and qualitative methods, often requiring careful sequencing. Quantitative methods include surveys, standardized tests, and rating scales, which provide numerical data for statistical analysis (Hirose & Creswell, 2023). Qualitative methods, such as interviews, focus groups, and

observations, offer rich contextual insights (Maxwell, 2016). The timing of data collection can be concurrent (collecting both types simultaneously) or sequential (one phase informing the next), depending on the study's goals (Creswell & Plano Clark, 2018).

Data Analysis Techniques

Data analysis techniques in mixed methods involve both statistical and thematic approaches. Quantitative analysis uses descriptive (e.g., means, frequencies) and inferential statistics (e.g., t-tests, regression) to identify patterns and relationships (Timans et al., 2018). Qualitative analysis often employs coding, thematic analysis, or grounded theory to identify key themes and narratives (Braun & Clarke, 2006). The integration of findings occurs through triangulation, side-by-side comparison, or narrative interpretation, helping researchers corroborate and contextualize numerical and textual data (Ivankova & Plano Clark, 2018).

Data Integration Strategies

Data integration strategies ensure a comprehensive interpretation of mixed methods data. Merging data allows researchers to present qualitative and quantitative findings side by side for direct comparison (Creswell & Plano Clark, 2018). Connecting data involves using findings from one phase to inform the next, such as conducting interviews to explain surprising survey results (Tashakkori & Teddlie, 2010). Embedding data prioritizes one method while using the other to provide additional insight, such as a primarily quantitative study supplemented with qualitative narratives for context (Ivankova & Plano Clark, 2018). These strategies enhance the depth and validity of mixed methods research.

Quality and Validity in MMR

Determining rigor in research designs is a crucial step to determine how much trust viewers can place in the outcome of research. Both quantitative and qualitative methods have longstanding means of determining various elements of rigor. Mixed methods designs, on the other hand, are newer approaches to research, and therefore, the means of establishing rigor are still being understood. Ultimately, we always want to be asking if the study is good enough to be trusted and engaging in ways to evaluate methodologies used / potential bias to broadcast to others how much we can trust the results. In MMR, since we're combing two approaches, we've identified two areas to assess to determine some basic validation (Harrison et al., 2020). First, how reliable are the strategies we used to combine quantitative and qualitative data (ensuring integration

quality), and second, how are we managing the analysis of qualitative data (reflexivity and researcher positionality)?

Common reporting and validation strategy in MMR	***Description***
GRAMMS Framework	The Good Reporting of a Mixed Methods Study (GRAMMS) is a widely recognized framework for reporting rigor in MMR. Researchers using this framework report justification, design type, mono-method components, data integration, limitations, and insights gained from data mixing (Harrison et al., 2020).
Holistic Quality	Beyond GRAMMS, holistic quality in MMR considers factors such as sample size, instrument reliability, and overall study coherence (O'Cathain, 2020).
Integration	The core of MMR, integration, involves mixing qualitative and quantitative data. High-quality integration includes presenting complete data strands, justifying integration, and synthesizing results for a merged comparison (Harrison et al., 2020).
Reflexivity	Reflexivity focuses on the qualitative aspects of MMR, ensuring reliability through researcher self-reflection, triangulation, and articulating the justification behind the MMR design. Researchers must also provide insights post-data integration (O'Cathain, 2020).

Ethical Considerations in Multiple and Mixed Methods Research

While general research ethics were discussed in a previous chapter, ethical considerations within these MMR designs are complex due to the convergence of qualitative and quantitative approaches with their own unique sets of ethical challenges. Issues of informed consent, confidentiality, and the integration of the two approaches must all be addressed while participants are made aware of the ways their information will be applied with the various approaches. Power relationships can also impact the response of participants, especially with vulnerable groups within the realms of counseling, education, nursing/medicine, or cross-cultural research. Therefore, it is important to preserve the well-being of participants, especially within the emotionally charged research environment. Ethical MMR necessitates meticulous planning, culture sensitivity, and a dedication to the minimization of harm while maximizing the research integrity and impact.

Informed Consent Across Methods

Mixed methods research (MMR) poses specific challenges to the attainment of informed consent due to the multifaceted approaches to data collection involved. In contrast to single-method research, MMR necessitates that the participants are made aware of the way their data will be merged between qualitative and quantitative elements that could include varying levels of disclosure and anonymity. For example, survey information can usually be anonymized while the recordings of the interviews or case studies might include information that creates greater confidentiality concerns (Dawadi et al., 2021). It is the responsibility of the researchers to properly inform the participants about the way personal information is kept, secured, and connected to avoid the participants being kept in the dark about the possible threats and rewards of their participation. Ethical concerns also include confidentiality of the data, especially within counseling or educational environments where personal information might be revealed. Researchers need to have measures to avoid revealing identities unintentionally while triangulating with numeric information (Wisdom & Creswell, 2013).

Last, working with vulnerable groups within schools, counseling clinics, hospitals, prisons, or oppressed communities requires a culturally aware and ethically driven approach to MMR. Power relationships between participants and researchers can be increased with the use of mixed methods since qualitative research entails closer personal interactions while quantitative research can impose hierarchical frameworks with the use of standard measures (Bryman, 2012).

Challenges & Limitations

Dawadi et al. (2021) noted that MMR, while delivering more answers to traditional research questions, can often fail in achieving its' goal to produce conclusive outcomes. The risk of clear research outcomes in MMR studies lie in its' design to mix data, which presents a number of additional threats, more so than traditional methods. Additionally, the act of mixing up data presents a direction of too many ambiguous research questions, Creswell (2003) warned. Therefore, the multiple and MMR approaches are not recommended for novice researchers, and those wanting to apply the method should seek further training and experience under seasoned researchers (Dawadi et al., 2021). There are a number of common practical challenges and limitations to MMR designs, and Dawadi et al. (2021) summarized them as follows:

Common Risk/Limitation in MMR	*Description*
Cost and time	MMR can be lengthy and expensive, often exceeding budgets and research timelines.
Difficulties integrating data	Integrating data can be complex, with limited guidance in existing literature.
Conflicting philosophies	Differences in quantitative and qualitative methodologies can create biases in data interpretation.
Retaining quality in data integration	One dataset may overpower the other, diminishing its independent value.
Incorrect design decisions	Choosing the wrong MMR design can impact study outcomes and data prioritization.

Criticisms of MMR Designs

Conflicting Philosophies

Mixed methods research (MMR) has been widely adopted as an approach to integrating qualitative and quantitative methodologies to address complex research questions. However, it has also been subject to significant criticism. One major critique of MMR revolves around its conflicting philosophies for conducting research. As Dawadi et al. (2021) highlighted, MMR combines elements from positivism (which assumes a singular, objective reality) and interpretivism (which embraces multiple, socially constructed realities). Critics argue that these paradigms are incompatible, making it difficult to reconcile their underlying assumptions within a single study (Maxwell, 2016). Incompatible paradigms can lead to methodological inconsistencies, where researchers struggle to maintain coherence in their designs, data collection, and interpretation. Additionally, some scholars contend that MMR is often driven by the motivations of the researcher rather than being grounded in the foundations for successful research (Guba, 1987; Smith, 1983).

Logistical Traps

Another significant critique of MMR is its practical and logistical challenges. The integration of qualitative and quantitative data requires researchers to be proficient in both methodologies, which can be particularly demanding (Wisdom & Creswell, 2013). Issues such as the time-consuming nature of data collection, difficulties in integrating findings from different methodological traditions, and challenges in ensuring quality and rigor across both approaches have been widely documented (David et al., 2018; Dawadi, 2019). Furthermore, the potential for conflicting results between qualitative and quantitative strands can complicate data interpretation, sometimes leaving

researchers unsure of how to synthesize divergent findings (Salehi & Golafshani, 2010). The additional burden of justifying methodological choices and ensuring that the study does not become excessively broad or unfocused can further hinder the effective application of MMR (Wilkinson & Staley, 2019). Despite these criticisms, proponents argue that with careful design and clear justification, MMR can offer an approach to complex research problems by leveraging the strengths of both qualitative and quantitative methods (Bryman, 2012; Creswell & Plano Clark, 2018).

Looking Ahead: Trends and Future Directions

Technological Advances

The rise of digital tools and software has significantly enhanced the ability to apply MMR designs, allowing for better integration of qualitative and quantitative data. Advanced software platforms such as NVivo, Dedoose, MAXQDA, and ATLAS.ti now support integrated data analysis, enabling researchers to more accurately link qualitative data with quantitative variables. Similarly, statistical tools like R and SPSS have features that utilize mixed methods approaches (Creswell & Plano Clark, 2018). These tools reduce the complexity of integrating diverse datasets, making MMR more efficient and less prone to risks outlined above. Additionally, innovations in data visualization are improving how mixed methods findings are presented. Interactive dashboards, heat maps, and AI-assisted visual analytics allow for the simultaneous representation of qualitative themes and quantitative trends, enabling researchers to better articulate their findings.

Global and Cross-Cultural Expansion

Internationally, MMR is increasingly being adopted as a commonly used framework for research. As research increasingly extends beyond Western frameworks, MMR allows scholars to balance standardized quantitative measures with culturally specific qualitative insights. This adaptability is particularly valuable in global health, education, and community development studies, where researchers must account for local traditions, languages, and social norms (Bryman, 2012). One challenge in international MMR is ensuring that methodological approaches are culturally sensitive and contextually relevant. Researchers must carefully adapt survey instruments, interview protocols, and data interpretation techniques to reflect the values and lived experiences of different populations. Additionally, ethical considerations in cross-cultural research require researchers to prioritize community engagement and participatory methodologies, ensuring that findings are meaningful and actionable within local settings (Wisdom & Creswell, 2013).

Key Takeaways

1. Mixed methods and multiple methods approaches to social research are similar but distinct.
2. MMR provides a rich way for researchers to approach complex, multifaceted problems by utilizing both qualitative and quantitative approaches, facilitating a deeper, richer understanding of research problems by enabling the capture of both numeric patterns and rich descriptive narratives (Dawadi et al., 2021).
3. To best leverage the value of MMR, researchers need to implement best practice in the design, conduct, and reporting of the research—guaranteeing methodological rigor, ethics integrity, and transparent integration of results. Furthermore, a dynamic, adaptive approach to research maximizes the flexibility of MMR to allow researchers to adapt the approach to emerging results.
4. With the flexibility of MMR, researchers can conduct research that not only increases academic knowledge but also informs practical applications within the social sciences.

Additional Resources

MMR Data Analysis Software

Atlas.ti (https://atlasti.com/)

Dedoose (https://www.dedoose.com/)

MAXQDA (https://www.maxqda.com/)

NVivo (https://lumivero.com/products/nvivo/)

SPSS (https://www.ibm.com/spss)

R (https://www.r-project.org/) – *free*

Discussion of Applied MMR to Social Science Professions

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Examples of MMR

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13

ACTION RESEARCH FOR PRACTITIONERS

Phillip Olt

Definitions of Key Terms

- Action Research: An iterative approach to applied research, which can use a variety of social science research methods for the purpose of addressing a local problem of practice or continuous improvement.
- Applied Research: The systematic collection and analysis of data to generate new knowledge for a specific applied purpose.
- Collaborative Action Research (CAR): A type of action research when multiple practitioners addressing a shared issue of practice.
- Data: A plural term for facts or evidence collected; data may be both numerical and non-numerical.
- Educational Action Research (EAR): A type of action research specifically done in the field of education, which is broken into three sub-types of emancipatory, practical, and knowledge-generating.
- Method: A way of doing something; for examples, a survey is way of collecting quantitative data, and an interview is a way of collecting qualitative data.
- Methodology: Properly, "the study of methods;" in practice, a methodology is an over-arching approach to research that has coherent purpose, data collection methods, data analysis, and outcomes.
- Participatory Action Research (PAR): A type of action research that pairs practitioners (insiders) with professional researchers (semi-insiders/outsiders) to co-create knowledge for social change.
- Qualitative: An approach to social science research that focuses on the collection and analysis

of data that provides deep insights into a phenomenon rather than generalization. Often, qualitative research is used in either an exploratory (*giving preliminary insight to an un-/under-studied phenomenon*) or explanatory (*giving deeper insight to a previously-studied phenomenon*) way.
- Quantitative: An approach to social science research that focuses on the collection and analysis of numerical data to consider relationships among variables. Often, quantitative research has the goal of producing generalizable results by performing statistical analysis of a small representative sample of the population and implying those results upon the full population.
- Research: A systematic approach to generating new knowledge situated within the body of knowledge for an area of study.
- Social Science Research: The scientific study of people, from individuals and relationships to society, which is situated within the existing body of knowledge; it is contrasted the approaches to studying humanity rooted in the natural sciences, philosophy, or humanities.

What is "action research"?

Recalling back to Chapter 1 "Foundations," action research is defined relatively coherently across social science disciplines. As a basic, working definition in this text, *action research is an iterative approach to applied research, which can use a variety of social science research methods for the purpose of addressing a local problem of practice or continuous improvement.* Some key elements in that definition:

- *iterative.* Action research is not a one-and-done approach; rather, it is intended to be repeated over and over (perhaps indefinitely) in the same general sequence. Action research is most often described as a spiral or a cycle, wherein it repeats over and over with directionality toward improvement.
- *can use a variety of social science research methods*. Action research is not beholden to a single method or methodology. Originally and maybe most commonly, action research has primarily used qualitative methods without an overarching methodology (like ethnography). However, quantitative methods or multiple/mixed methods can absolutely be used as well. In the field of education (and specifically, teaching), quantitative methods may even be more common. For example, a teacher might use a pre-/post-test model for their data collection with one section of US History using the same pedagogical approach to a unit (control group) and another section of US History using a new pedagogical method for the same unit (experimental group).
- *for the purpose of addressing a local problem of practice or continuous improvement*. Whereas most formal research seeks to address broad problems for a broad audience or give deep insights into the same, action research very specifically addresses something local to the scholarly practitioner conducting the research. This should generally be something that the scholarly practitioner is

> directly involved with. It might look like a school counselor trying to understand why certain demographic groups at their school are less likely to see counseling support (and how to increase engagement by those groups) or this university professor trying to improve his courses and course materials.

The action research spiral or cycle can vary quite a bit in the details, but the concept and process are generally the same. While this chapter will introduce its own model, one other example to consider is Mertler's (2024) organization: Planning, Acting, Developing, Reflecting [repeat indefinitely]. In this simple approach, the Planning Stage is focused on identifying a problem, searching what is known about it from research, and developing a plan to investigate an intervention. The Acting Stage involves doing the research plan and then gathering and analyzing data. In the Developing Stage, the scholarly practitioner comes up with an action plan based on the data analysis to improve practice, and then the Reflecting Stage is where they reflect on the action research plan and possibly share their results.

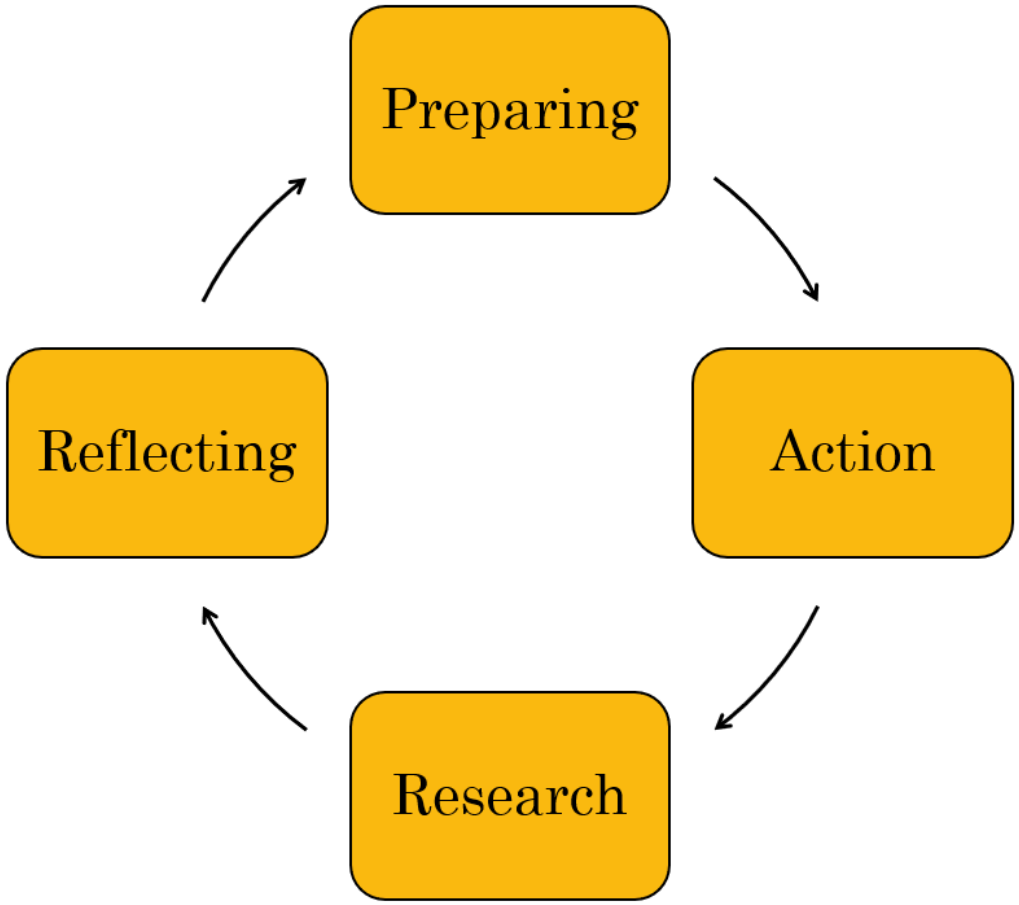
As a practical illustration, a high school history teacher might realize that a specific unit tends to be the hardest for their students. They might dig into their plans and perceptions of the topic. Then, after talking to peers, searching research literature, etc., they determine an alternate approach to teaching that unit. Then, they use multi-form pre/post tests to evaluate three sections of their history class using their old pedagogy and three sections using the new pedagogy. Tentative conclusions are reached about effectiveness, and the approach for the next school year is planned. Next year, that approach is evaluated against yet another approach.

The Action Research Spiral / Cycle

There are a great number of ways to phrase and visualize action research. However, as Mertler (2024) observed, "Which model should you follow? Personally, I do not think it really matters, as I see them essentially as variations on the same theme (as evidenced by their shared elements)" (p. 18).

The two most common visualizations are of a spiral or a cycle, suggesting a repeated process that continues indefinitely. In the spirit of methodologists coining their own version of action research, I will share how I conceptualize action research as a cycle, though recognizing the significant overlap with others' models. Thus, the four phases of the action research cycle are:

1. Preparing
2. Action
3. Research
4. Reflecting



Preparing

The Preparing Phase is, in this model, expansive, but it is all sensibly associated, as it is everything that happens before the "action" part of action research. It begins with an observation, usually of a problem of practice that needs to be addressed or an innovation that is desired to try. This is then followed by a thorough search to see what is known about that phenomenon—from discussions with peers to internet searches to a review of research literature. Finally, a plan is formulated, including both the desired intervention or innovation as well as how data will be gathered and assessed to evaluate efficacy. Note that, in action research studies, the research question(s) should be formulated specific to the setting and problem of practice.

Action

The Action Phase is rather straightforward, with the scholarly practitioner doing their planned intervention or innovation.

Research

The Research Phase is about collecting and analyzing data. The timing for collection will vary, depending on the research plan. There may be quantitative, qualitative, or mixed data generated through the research, which could be collected in a pre-/post-test model, all at the end, throughout, or really any variation of timing that makes sense (and, thus, could overlap the Action Phase).

Reflecting

So what? Even analyzed data are meaningless without taking the time to interpret and apply them. As action research is an applied research approach meant to be practical in nature, the scholarly practitioner needs to take time to consider what the data mean and what tentative conclusions for practice to draw from them. This is the Reflecting Phase.

The end of the Reflecting Phase, however, is the beginning of a new Preparing Phase. The tentative conclusion could be that there is no conclusion, as the data or design were insufficient; in that case, essentially the same action research study might be launched again in a new cycle. Perhaps, the new, better solution will now be compared to *another* potential solution in an ongoing attempt at continuous improvement; alternatively, the scholarly practitioner might be satisfied with their results on this specific topic and begin new action research on another problem or innovation.

Types of Action Research

As with many things in social sciences research methods and methodologies, action research continues to evolve. This is, however, just one chapter in a book for those getting started with social science research, and so every possible sub-type of action research will not be considered here. Broadly speaking then, the three most widely recognized types of action research are collaborative, participatory, and educational.

It is also important to note here that action research may be conducted as *just* basic action research without any type or sub-type. That is not an inferior choice at all. The types exist to extend action research not replace it.

Collaborative Action Research (CAR)

Sagor (1993) defined CAR as a sub-type of action research wherein, "we… begin developing an active community of professionals. The process described in this book is based on teams of practitioners who have common interests and work together to investigate issues related to those interests" (pp. 9-10). Whereas generally we might think of action research being done by a single practitioner to address an issue of their own practice, CAR occurs when multiple practitioners address a shared issue of practice. This might take the form of a group of community organizers investigating low voter turnout in their community or all 4th grade teachers at a school working to solve an issue in the shared 4th grade curriculum. In CAR, all researchers are practitioners and insiders to the problem.

Example CAR Study

Artiera-Pinedo, I., Paz-Pascual, C., Bully, P., Esponisa, M, & EmaQ Group. (2021). Design of the maternal website EMAeHealth that supports decision-making during pregnancy and in the postpartum period: collaborative action research study. *JMIR Formative Research, 5*(8), Art. e28855. https://doi.org/10.2196/28855

Participatory Action Research (PAR)

Cornish et al. (2023) defined and described PAR as:

> …participatory action research (PAR) is a scholar–activist research approach that brings together community members, activists and scholars to co-create knowledge and social change in tandem. PAR is a collaborative, iterative, often open-ended and unpredictable endeavour, which prioritizes the expertise of those experiencing a social issue and uses systematic research methodologies to generate new insights. Relationships are central. PAR typically involves collaboration between a community with lived experience of a social issue and professional researchers, often based in universities, who contribute relevant knowledge, skills, resources and networks. PAR is not a research process driven by the imperative to generate knowledge for scientific progress, or knowledge for knowledge's sake; it is a process for generating knowledge-for-action and knowledge-through-action, in service of goals of specific communities. The position of a PAR scholar is not easy and is constantly tested, as PAR projects and roles straddle university and community boundaries, involving unequal power relations and multiple, sometimes conflicting interests. (p. 2)

This definition and description is useful for our text here. PAR pairs practitioners (insiders to the setting and problem) with professional researchers (semi-insiders/outsiders). Ideally, those professional researchers have relevant knowledge and experience with the setting or phenomenon (making them semi-insiders). That might

look like a recent middle school teacher who earned their doctorate and moved to a university in a new state doing PAR with one or more current middle school teachers nearby the university. However, that semi-insider status is not absolutely necessary, and so those professional researchers may just be true outsiders, providing methodological expertise and facilitation toward the shared goal. PAR is contrasted with CAR by the introduction of that semi-insider/outsider, as CAR is a collaboration among insiders only. Then, though the title does not explicitly suggest it, PAR is almost always used in an activist way in promoting social change, rather than addressing a specific, narrow problem. That social change might be at the organizational, city, etc. levels rather than society or worldwide, but it is still at a higher level than a single practitioner.

Example PAR Study

Feger, C., & Mermet, L. (2022). New business models for biodiversity and ecosystem management services: Action research with a large environmental sector company. *Organization & Environment, 35*(2), 252-281. https://doi.org/10.1177/1086026620947145

Educational Action Research (EAR)

As implied in the title, EAR is action research in the field of education. Sometimes, there is a debate as to whether EAR is actually a type of action research or just a setting; however, EAR is still most widely recognized as a type and will be treated as such in this text. Newton and Burgess (2008) described three sub-types (or, as they call them, "modes") of EAR: practical, emancipatory, and knowledge generating. These three sub-types are really distinguished by their purposes.

Mertler (2024) defined practical action research as a "type of action research focused on addressing a specific problem or need in a classroom, school, or similar community " (p. 315). This is probably the most common sub-type, wherein, for example, a teacher applies action research to address an immediate problem of practice in their teaching.

However, those problems may (and often, do) have bigger causes, implications, and solutions. To that end, EAR applied to more social justice ends may be referred to as emancipatory. However, that emancipatory goal can be a "'tough sell' in schools as these approaches demand that practitioners take a hard look at the structures and social arrangements that dominate segments of the population, arrangements that they (teachers) might function to reinforce" (Newton & Burgess, 2008, p. 19).

Finally, knowledge-generating EAR is that which is done deliberately to *both* address a problem of practice *and* disseminate the report of that process broadly. This might, for

example, be shared through publication in a scholarly journal or presented at a district-wide professional development.

Example EAR Study

Wastin, E, & Han, H. S. (2014). Action research and project approach: Journey of an early childhood pre-service teacher and a teacher educator. *Networks: An Online Journal for Teacher Research, 16*(2), Art. 7. https://doi.org/10.4148/2470-6353.1044

Key Takeaways

1. Action research is a form of applied social research, which should be utilized by professionals in an ongoing cycle to address problems of practice or to promote continuous improvement.
2. Action research can be done generally or in one of several specific types, largely based on whether the action research is (1) being done individually or with others and (2) whether those doing the research are insiders or a mix of insiders/semi-insiders/outsiders to the community of practice.
3. Action research is conceptualized as a spiral or cycle that happens iteratively (*over and over*) to refine practice—Preparing, Action, Research, Reflecting, [repeat].

Additional Open Resources

Clark, J. S., Porath, S., Thiele, J., & Jobe, M. (2020). *Action research*. NPP eBooks. https://newprairiepress.org/ebooks/34

Chapter References

Artiera-Pinedo, I., Paz-Pascual, C., Bully, P., Esponisa, M, & EmaQ Group. (2021). Design of the maternal website EMAeHealth that supports decision-making during pregnancy and in the postpartum period: collaborative action research study. *JMIR Formative Research, 5*(8), Art. e28855. https://doi.org/10.2196/28855

Clark, J. S., Porath, S., Thiele, J., & Jobe, M. (2020). *Action research*. NPP eBooks. https://newprairiepress.org/ebooks/34

Cornish, F., Breton, N., Moreno-Tabarez, U., Delgado, J., Rua, M., de-Graft Aikins, A., & Hodgetts, D. (2023). Participatory action research. *Nature Reviews Methods Primers, 3*, Art. 34. https://doi.org/10.1038/s43586-023-00214-1

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Mertler, C. A. (2024). *Action research: Improving schools and empowering educators* (7th ed.). SAGE Publications.

Newton, P., & Burgess, D. (2008). Exploring types of educational action research: Implications for research validity. *International Journal of Qualitative Methods, 7*(4), 18-30. https://doi.org/10.1177/160940690800700402

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ANALYZING QUANTITATIVE ARTICLES (WORKSHEET)

Read your assigned quantitative article, and then work through the questions below. If describing something specific from the article, you must identify / quote it with a page number citation (not just "yes").

Example

Question 1: *Did the author(s) provide a review of the literature (even if it is not named as such in a heading)? If so, was it timely (i.e. majority of citations from within 5 years of publication)? Did the author(s) effectively make the case that there was a gap in need of study and how this current study fits that gap? How so, or how not?*

Answer: *Yes, the authors did provide a review of the literature (pp. 117-119), though it filled a combined role with the introduction. Only 5 of 27 citations came from within the five years prior to this article being published. While that is not absolutely problematic, I wish that they had situated this study more directly within current research literature. Yes, I do believe they effectively made a case for this study in the "Present Study" section on p. 119. Prior studies had not considered the racial identity of the teachers involved, which this present study investigated.*

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1. Did the author(s) provide an introduction to their article (even if there is no heading labeled "Introduction;" note the abstract is *not* an introduction)? If so, did it effectively introduce the reader to topic and hook the reader to continue reading? How so, or how not?

[Insert Response Here]

2. Did the author(s) provide a review of the literature (even if it is not named as such in a heading)? If so, was it timely (i.e. majority of citations from within 5 years of publication)? Did the author(s) effectively make the case that there was a gap in need of study and how this current study fits that gap? How so, or how not?

[Insert Response Here]

3. What approach did the author(s) use to study their topic (exs. survey, experiment, secondary data analysis etc.)? Did the author(s) discuss strengths and weaknesses of that approach (generally)? Was a purpose, hypothesis, and/or research question(s) clearly presented?

[Insert Response Here]

4. Describe the participants in this study. How were they selected? Do they seem appropriate and adequate for the study? How so, or how not?

[Insert Response Here]

5. How did the author(s) analyze the data? How did they then present their findings?

[Insert Response Here]

6. How did the author(s) address the quality and integrity of the article (exs., validity, reliability, significance)?

[Insert Response Here]

7. Did the findings / results directly achieve the purpose and/or answer the research question(s)? Were they clearly presented so that you thoroughly understood them? How so, or how not?

[Insert Response Here]

8. Did the discussion / conclusion include applications for theory, research, and/or practice? If so, do you believe they were appropriate? Why, or why not?

[Insert Response Here]

9. What did you learn from the content of the article, and how could that be applied to your current or future desired professional situation?

[Insert Response Here]

10. Rate the author(s)' methodology as a whole number from 1 (horrible) to 5 (awesome) and explain why.

[Insert Response Here]

ANALYZING QUALITATIVE ARTICLES (WORKSHEET)

Read your assigned qualitative article, and then work through the questions below. If describing something specific from the article, you must identify / quote it with a page number citation (not just "yes").

Example

Question 4: *Describe the participants in this study. How were they selected? Are they appropriate and adequate for addressing the purpose and/or research question(s)?*

Answer: There were 14 participants in this study, selected through a convenience sampling strategy (p. 72). They were simply those who agreed to participate, so they were not representative along demographic lines (ex. all identified as women). I think the number of participants was appropriate, but because the participants had such homogeneous demographic characteristics that were not the same in the population, I do not think that the author really was able to answer their research question. Either the author needed more diverse participants, or they needed to modify their research question to be just "among students who identify as women."

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1. Did the author(s) provide an introduction to their article (even if there is no heading labeled "Introduction;" note the abstract is *not* an introduction)? If so, did it effectively introduce the reader to topic and hook the reader to continue reading? How so, or how not?

[Insert Response Here]

2. Did the author(s) provide a review of the literature (even if it is not named as such in a heading)? If so, was it timely (i.e. majority of citations from within 5 years of publication)? Did it prepare the reader to understand the major topics of the study / findings? How so, or how not?

[Insert Response Here]

3. What methodology did the author(s) use to study their topic? Was a purpose and/or research question(s) clearly presented? Did the methodology align with that purpose and/or research question(s)? How so, or how not?

[Insert Response Here]

4. Describe the participants in this study. How were they selected? Are they appropriate and adequate for addressing the purpose and/or research question(s)? How so, or how not?

[Insert Response Here]

5. What were the methods of data collection, and how did the author(s) use them in this study? How did the author(s) analyze the data?

[Insert Response Here]

6. How did the author(s) address the quality and integrity of the article (exs., reliability, trustworthiness)?

[Insert Response Here]

7. Did the findings / results directly achieve the purpose and/or answer the research question(s)? Were they clearly presented so that you thoroughly understood them? How so, or how not?

[Insert Response Here]

8. Did the discussion / conclusion include applications for theory, research, and/or practice? If so, do you believe they were appropriate? Why, or why not?

[Insert Response Here]

9. What did you learn from the content of the article, and how could that be applied to your current or future desired professional situation?

[Insert Response Here]

10. Rate the author(s)' methodology as a whole number from 1 (horrible) to 5 (awesome) and explain why.

[Insert Response Here]

ANALYZING MIXED METHODS ARTICLES (WORKSHEET)

Read your assigned mixed methods article, and then work through the questions below. If describing something specific from the article, you must identify / quote it with a page number citation (not just "yes").

Example

Question 6: *Did the findings / results directly answer the research questions? Were they clearly presented so that you thoroughly understood them? How so, or how not?*

Answer: *That question is difficult to answer, because the authors did not include their research questions in this study. They loosely articulated a purpose ("...to understand teachers' perceptions of delivering state standardized tests..." on p. 213), and they did not seem to answer that question. Their "Findings" section, however, did not seem to clearly address that. Their findings were organized under the headings "Anxiety about Financial Stability" (p. 215), "Anger at Administration" (p. 215), and "No Time for Teaching" (p. 217). Some of that content did seem to reflect upon delivering standardized tests, but much of it did not. Now, reading each of those sections was clear to me. They included simple data tables with descriptive statistics and then some quotes from participants to illustrate those numerical findings.*

---

1. Did the author(s) provide an introduction to their article (even if there is no heading labeled "Introduction;" note the abstract is *not* an introduction)? If so, did it effectively introduce the reader to topic and hook the reader to continue reading? How so, or how not?

[Insert Response Here]

2. Did the author(s) provide a review of the literature (even if it is not named as such in a heading)? If so, was it timely (i.e. majority of citations from within 5 years of publication)? Did it prepare the reader to understand the major topics of the study /

findings and/or establish a gap in the literature addressed in this study? How so, or how not?

[Insert Response Here]

3. What approach to mixed methods research did the author(s) use to study their topic (exs. explanatory sequential, concurrent)? Did the author(s) present *at least* three clear research questions (quantitative, qualitative, and a mixing question)? Did the approach to research align with those research question(s)? How so, or how not?

[Insert Response Here]

4. Describe the participants in this study. How were they selected? Are they appropriate and adequate for addressing the research questions? How so, or how not?

[Insert Response Here]

5. What were the methods of data collection, and how did the author(s) use them in this study? How did the author(s) analyze the data?

[Insert Response Here]

6. How did the author(s) address the quality and integrity of the article (exs., validity, reliability, significance, trustworthiness)?

[Insert Response Here]

7. Did the findings / results directly answer the research question(s)? Were they clearly presented so that you thoroughly understood them? How so, or how not?

[Insert Response Here]

8. Did the discussion / conclusion include applications for theory, research, and/or practice? If so, do you believe they were appropriate? Why, or why not?

[Insert Response Here]

9. What did you learn from the content of the article, and how could that be applied to your current or future desired professional situation?

[Insert Response Here]

10. Rate the author(s)' methodology as a whole number from 1 (horrible) to 5 (awesome) and explain why.

[Insert Response Here]

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