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Definitions, Purposes, and Dimensions of Research

In this chapter, we discuss definitions and several purposes of research. Then, we describe important dichotomies or dimensions along which research studies vary. Next, we provide an overview of our general framework for describing types of quantitative research that we call approaches. Finally, we briefly describe five studies that serve as examples for each of the five research approaches. The sample studies will be used in this and several later chapters to illustrate research concepts and how to evaluate research.

Definitions of Research

What is **research**? Many definitions have been given. Two examples are (1) a systematic method of gaining new information and (2) a persistent effort to think straight. The definition utilized by government agencies for the purpose of federal regulation and the protection of human participants is the systematic collection of data that develops or contributes to generalizable **knowledge**. Such data are intended to be published, are part of a thesis or dissertation, are presented to the public, or are developed for others to build on. (The ethical and practical issues of the review of human research are discussed in Chapters 14 and 15.)

Smith (1981), in an old but still useful definition, suggests that the term *research* be equated to **disciplined inquiry**, which

must be conducted and reported so that its logical argument can be carefully examined; it does not depend on surface plausibility or the eloquence, status, or authority of its author; error is avoided; evidential test and verification are valued; the dispassionate search for truth is valued over ideology. Every piece of research or evaluation, whether naturalistic, experimental, survey, or historical must meet these standards to be considered disciplined. (p. 585)

Smith's definition of disciplined inquiry is worth considering in some detail. The term **inquiry implies a systematic investigation**, which is certainly a part of any definition of research. Regardless of the particular research paradigm

Research

Disciplined method of gaining new information, building knowledge, or answering questions; also called disciplined inquiry; implies a systematic investigation with underlying guidelines regardless of the particular research paradigm.

Knowledge (producing)

Research which builds on or adds to the knowledge-base of the profession.

Disciplined inquiry

See *Research*.

Inquiry

A systematic investigation by seeking information and/or knowledge.

to which the investigator adheres, **there must be underlying guidelines for how the research is to be carried out.** The focus of this book is on quantitative methods, so most of our discussion will be about that research strategy.

Notice that Smith's (1981) definition of disciplined inquiry states that the **research must be conducted and reported so it can be carefully examined.** The conducted part of the definition implies that the research must be carried out. Designing research serves no useful purpose if it is not actually performed. Also, the research must be reported—that is, published in a journal or at least delivered as a talk at a professional meeting. This dissemination function is important if the research is to be examined by others in some detail. Unless the research is conducted and reported, it cannot be evaluated or replicated to determine whether, given similar circumstances, others would come to the same conclusion as the investigators.

Finally, this definition refers to the fact that the research must stand on its own merit. It should not matter who performed the research, how eloquently it might be described, or even the nature of the problem. If the research has been carried out systematically, following guidelines within a particular research paradigm, and disseminated within a particular discipline, then that research could be tested or verified by others. While there have been numerous attempts to define research, we feel that this definition includes the key elements of the concept.

Purposes of Research

Why do we do research? What is it that we want to find out? Some questions from education that have been addressed with research studies are as follows:

- Does class size affect student outcomes?
- Is cooperative learning more successful than individualized learning?
- Do students with special needs do better if mainstreamed into the school system?

Some questions that need to be addressed in allied health fields are as follows:

- Does a particular treatment work?
- Are certain characteristics of therapists more effective than others?
- Is supported employment more successful for community integration than sheltered work?

There are many purposes for carrying out research. The rationale for learning about research will be divided into two general purposes: (1) increasing the knowledge base of the discipline; and (2) increasing your self-knowledge as a professional consumer of research to understand new developments within the discipline.

Increasing the Knowledge Base of the Discipline

This purpose of research, discovery of new knowledge, can take many directions; three of them are discussed here.

Theory Development

Research can support the theoretical basis of the discipline. A **theory** presents interrelated concepts, definitions, and propositions that provide a systematic view of phenomena and identify relationships among variables. For example, purposeful activity is a construct within the theory of occupation in the field of occupational therapy. The theory states that if the activity is “purposeful,” the individual performing the activity will be more invested in the activity and perform better. Studies to test this theory might use the following research design. Two groups are formed through **random assignment**, which means that a table of random numbers, or perhaps a coin toss, is used to *assign* each participant to either the *experimental* or *comparison* group. One group (comparison group) receives a condition of exercise (e.g., jumping in place). The other group (experimental group) also jumps in place, but this is done with a jump rope and the goal or purpose of doing it well. At the end of some given time period, the two groups are measured on performance, satisfaction, or motivation. If, as the theory predicted, the exercise-with-purpose condition was better than the exercise-without-purpose condition, the result would provide some support for the theory.

Practical Application

A second approach to increasing knowledge within the discipline involves **providing evidence for the efficacy of a curriculum**, a therapeutic technique, or administrative change when there may not be a theory that would predict the results. For example, one could compare the effectiveness of two approaches to teaching students. After randomly assigning students to one of two curriculums, both groups are assessed on several outcome measures such as achievement tests. This type of study is typically used to test the effectiveness of different therapeutic or curricular interventions. Notice that the design of this study and the prior one are similar, but the purposes are somewhat different.

Development of Research Tools

A third approach to increasing knowledge within the discipline involves **creating methods to assess behaviors**. For example, researchers could develop a new standardized testing procedure and set of tasks to assess mastery motivation in young children. The procedure could be designed to be useful for typically developing children and also for children who are at risk for developmental problems. To compare children with different ability levels, an individualized approach to measuring mastery motivation could be developed. This approach could vary the difficulty of the task in accordance with the child’s ability level so that each child is given tasks that are moderately

Theory development

One purpose of research, to support the theoretical basis of the discipline.

Theory

A statement or group of statements that explains and predicts relationships among phenomena; a set of interrelated concepts, definitions, and postulations that present a systematic view of phenomena by specifying relations among variables.

Random assignment

A random table of numbers (or other similarly random process) is used to assign each participant to a group.

difficult. Each child's motivation is assessed with tasks, from several graded sets of similar tasks that are found to be challenging but not too difficult or too easy. *Evidence for the validity* or usefulness of these mastery task measures could be confirmed in several ways. For example, groups of children (e.g., those who are at risk) who had been predicted to score lower on mastery motivation measures could be compared with a group of typically developing children.

Increasing Your Self-Knowledge as a Professional

For most students and professionals, the ability to *understand* and *evaluate* research in one's discipline may be more important than personally making a research contribution to the profession. Dissemination of new knowledge occurs for the professional through an exceptionally large number of journals, workshops, and continuing education courses as well as popular literature such as daily newspapers. Today's professional cannot simply rely on the statements of a workshop instructor or newspaper to determine what should or should not be included for future intervention in the classroom, clinic, or community. Even journal articles need to be scrutinized for weak designs, inappropriate data analyses, or incorrect interpretation of these analyses. The current professional must have the research and reasoning skills to be able to make sound decisions and to support them. In addition, research skills can make the professional in education or therapeutic sciences a better provider because she knows how to examine her own school, classroom, or clients and note whether improvement in various areas has occurred.

Because conducting research (making a contribution to the profession) and understanding the research of others are important, this book provides a framework and advice for doing both. Suggestions for designing a study, collecting data, analyzing data, and writing about the results are spread throughout the book. A framework for understanding and evaluating research is introduced later in this chapter and amplified in Chapters 23–24.

Research Dichotomies

Now, we discuss briefly six contrasts or dichotomies that can be used to describe research: (1) theoretical versus applied; (2) laboratory versus field; (3) participant report versus researcher observation; (4) quantitative/postpositivist versus qualitative/constructivist philosophical or *theoretical framework*; (5) quantitative/objective versus qualitative/subjective data and data collection *methods*; and (6) quantitative/statistical versus qualitative/descriptive data *analysis*.

Although some studies fit well into one end of each dichotomy, other studies are mixed. For example, some studies have both *participant reported* and *researcher observed* measures. Some studies use both *qualitative* and *quantitative* methods and data.

Theoretical Versus Applied

Most social science disciplines perform research with some application in mind. The goal of the research is directed toward some specific, practical use, such as treatment, learning enhancement, or evaluation. Some **theoretical research** is performed in which there may or may not ever be an application of the knowledge gained. Most of the research projects we examine in this book are at the applied end of this dimension. Nevertheless, all studies have or should have some theoretical or conceptual framework and be based on previous research literature, even if the primary purpose is applied. The five sample studies described later in this chapter meet these criteria for **applied research** because they have a conceptual framework and describe how the current study fits with past research literature.

Laboratory Versus Field

A second dichotomy for describing a research study is the setting. **The term field could mean a clinic, school, work setting, or home. Laboratory implies a controlled, structured setting that is not where the subjects or participants usually live, work, or receive therapy.** In the social and allied health sciences, a laboratory most often refers to a room with a video camera and microphones (i.e., a somewhat unnatural setting). Social science disciplines usually perform research that is slanted toward **the field end of the dimension to be more ecologically valid**, but **laboratory settings provide better control over extraneous variables**. Sometimes testing of participants, to obtain the dependent variable measures, is done in a controlled laboratory-type setting, as are some studies of young children's play behavior.

Studies conducted in classrooms or in the **participants' homes** would be called field settings, as would studies in which teachers or workers were in their offices. **Occasionally, one study will utilize both a field setting (e.g., home) and a laboratory observation.**

Participant Report Versus Researcher Observation

In some studies the participants report to the researcher (in writing or orally) about their attitudes, intentions, or behavior. In other studies, the researcher directly observes and records the behavior of the participants, for example, children's play behavior or a physical exam of a patient. Sometimes instruments, such as standardized tests or heart rate monitors, are used by researchers to "observe" the participant's functioning. For example, achievement tests could be used in a study rather than asking participants to rate how much they thought they had learned.

A large amount of research in the applied social sciences and education relies on reports by the participants using interviews or questionnaires. For example, quality of life could be reported by participants. Such **participant reports** are always influenced by the fact that the participants know they are in a study; they may want to please the researcher; or they may want to hide, have forgotten, or do not really know things. For these reasons, many investigators prefer researcher observed behavioral data even though these

Theoretical research

Research that is performed in which there may or may not ever be an application of the knowledge gained.

Applied research

Research undertaken with the intent to apply the results to some particular practical problem.

Laboratory research

Research conducted in a controlled, structured setting that is not where the subjects or participants usually live, work, or receive therapy.

Subjects

See *Participants*.

Participants

Those who are the object of study in the research; generally individuals, but may be small groups, organizations, communities, etc.; also called cases, observations, elements, or subjects.

Participant report

Information provided directly by the participants in the study.

Qualitative research

One of five main nonexperimental research approaches: phenomenological, grounded theory, ethnographic, case study, and narrative.

Paradigm

A way of thinking about and conducting research; it is a *philosophy* which guides how the research might be conducted.

Postpositivist paradigm/theoretical framework

A way of thinking about and conducting quantitative research where a specific plan is developed prior to the study; see also *Paradigm*.

Constructivist paradigm/theoretical framework

Related ways of thinking about research where knowledge is constructed based upon experiences; also called the naturalist or qualitative paradigm; see also *Paradigm*.

Quantitative data and data collection

Data and data collection procedures are usually gathered with some sort of instrument that can be scored numerically, reliably and with relatively little training.

data also have potential limitations. On the other hand, sensitive, well-trained interviewers may be able to establish enough rapport with participants to alleviate some of the biases inherent in self-reports.

Quantitative Versus Qualitative Philosophical Paradigms

This is the most confusing and controversial dichotomy, because it deals with philosophical or paradigm differences in the approach to research. This philosophical dichotomy (sometimes called positivistic versus constructivist),¹ has had a major impact on how research methods courses are taught in the United States, especially in the discipline of education. Sometimes, this dichotomy has created an either/or mindset with qualitative and quantitative research methods courses taught separately. **In the postpositivist/quantitative framework, a specific plan is developed prior to the study. In the constructivist/qualitative approach, less structure is placed on the use of specific guidelines in the research design. However, there are general guidelines to be followed in qualitative research.**

What is a **paradigm**? The term, coined by Kuhn (1970), has been defined and used several ways in educational research (Morgan, 2007). One interpretation of paradigm is *the beliefs members of a scientific community share*. Others refer to a paradigm as a system of ideas or a systematic set of beliefs, together with their accompanying methods. In our view, a paradigm is a way of thinking about and conducting research. It is not strictly a methodology, but more of a *philosophy* that guides how the research might be conducted. More importantly, a paradigm determines the types of questions that are legitimate and in what context they will be interpreted.

The approach of this book is within the framework of the **postpositivist paradigm**; thus, it mainly focuses on quantitative methods. We feel that a textbook emphasizing the quantitative approach to research has several advantages. **First, to date, the majority of research performed in the social sciences, education, and allied health disciplines has used a quantitative methodology.** Thus, it is critical for students in these disciplines to be able to understand and build on these studies for future research. **Second, and perhaps more importantly, we feel that quantitative randomized experiments are the most appropriate methodology for answering questions about whether an intervention or new treatment causes an improved outcome.** We feel that a big advantage of the quantitative approach is that results from many studies can be combined to produce a large body of evidence toward answering questions that may not be answered in a single study. However, the **constructivist paradigm** provides us with useful tools, including types of data collection, data analysis, and interpretation methods.

Quantitative/Objective Versus Qualitative/Subjective Data and Data Collection

Students sometimes confuse the paradigm distinction just presented (quantitative versus qualitative philosophies) with *type of data and data collection techniques*. **Quantitative data are said to be “objective,” which implies that the behaviors are easily classified or quantified,** either by the participants

themselves or by the researcher. Some examples are demographic variables such as age and gender, scores on an achievement test, and time to recovery. The data usually are gathered with some sort of instrument (test, physiological device, or questionnaire) that can be scored reliably with relatively little training. The scores on multiple choice exams and quizzes are examples of quantitative data and a quantitative data collection technique.

Qualitative data are more “subjective,” which indicates that they could be interpreted differently by different people. Some examples are *perceptions* of pain, *feelings* about work, and *attitudes* toward school. Usually these data are gathered from interviews, observations, or narrative **documents** such as biographies. These types of data are also gathered in studies that are mainly quantitative, but in that case researchers usually would translate such perceptions, feelings, and attitudes into numbers. For example, participants’ subjective feelings of mental health or quality of life can be converted into numerical ratings or scores. In studies that are philosophically qualitative, on the other hand, researchers usually would not try to quantify such subjective perceptions: the data are kept in text form and analyzed for themes. We believe that the approach in this book is useful for dealing with both qualitative/subjective *data* and quantitative/objective *data*.

Note that a researcher could be philosophically postpositivist, but the data could be subjective and qualitative. In fact, this combination is quite common, especially when participants’ behavior is observed. On the other hand, a researcher may embrace the constructivist paradigm, and some of the supporting data may be quantitative or objective. Thus, the type of data and even data analysis are not necessarily the same as the research paradigm.

It is important to point out that studies done within *both* the quantitative/postpositivist paradigm and the qualitative/constructivist paradigm use interview and observational methods and both are interested in objective as well as subjective data. However, studies done from the constructivist viewpoint usually include *open-ended* interviews, observations, and narrative documents, such as diaries. Studies done mainly from the postpositivist viewpoint most commonly include *structured* interviews (or questionnaires), observations, and documents such as school or clinic records. We describe data collection methods in more detail in Chapter 13.

Quantitative/Statistical Versus Qualitative/Descriptive Data Analysis

Finally, we discuss a sixth dichotomy about how data are analyzed. The interpretation and understanding of **quantitative data analysis** is a major theme of this book. It is dealt with in detail in Chapters 16–22, which discuss many of the most common **inferential statistics** and show how they are related to the approaches and designs discussed in Chapters 4–7. **Qualitative data analysis** involves various methods for coding themes and assigning meaning to the data, which are usually words or images. This book does not deal very much with qualitative coding or data analysis techniques such as content analysis. Studies that use a constructivist framework rarely include inferential statistics, although sometimes the descriptive statistics discussed in Chapter 10 are used.²

Qualitative data and data collection

Data and data collection procedures that are more “subjective,” in that they could be interpreted differently by different people; usually gathered from interviews, observations, or narrative documents.

Documents

Any information that is collected regarding a participant through records or documents can be considered document data.

Quantitative data analysis

Involves various methods for coding, categorizing, and assigning meaning to the data, which are usually numeric and which usually involve the calculation of statistical measures.

Inferential statistics

Set of statistics which allow the researcher to make generalizations about the population from the sample studied.

Qualitative data analysis

Involves various methods for coding, categorizing, and assigning meaning to the data, which are usually words or images.

Relationships Among the Six Dichotomies

Certain of the six dichotomies tend, in common practice, to go together. For example, applied research tends to be done in field or natural settings, often using participant reports. Constructivist research is almost always conducted in the field. On the other hand, theoretically oriented research tends to be done in the lab, using **researcher observations**.

However, there is not a necessary association among any of these six dimensions. For example, applied research can be done in either the lab or field, using either observation or participant reports and can be either post-positivist/quantitative or constructivist/qualitative. As mentioned already, both postpositivist and constructivist researchers utilize interviews and observations so these methods are not restricted to one paradigm, type of data, or type of data analysis.

The Mixed Methods or Pragmatic Approach

Philosophically the postpositivist and constructivist paradigms are quite different, yet the two may be found together in one research study. When the two paradigms are blended so that one paradigm sets the stage for or leads to the other paradigm the approach is called **mixed methods**. (When the two approaches are included in the same study but are discussed separately this is not considered a mixed methods approach, but rather two methods are being used.) *The Handbook of Mixed Methods in Social and Behavioral Research* (Tashakkori & Teddlie, 2002) describes several strategies for such *mixed methods* approaches to research.

Morgan (2007) and Onwuegbuzie and Leech (2005) advocate a **pragmatic approach** as a new guiding paradigm for social and therapeutic science research methods, both for research that combines qualitative and quantitative methods and as a way to focus attention on methodological rather than philosophical concerns. Research conducted from the pragmatic approach utilizes exploratory and confirmatory methods (instead of qualitative or quantitative methods), which increases the options for researchers in regard to data collection methods, data analysis tools, and interpretations.

Research Types or Approaches

Now, we describe our general framework for **quantitative research**, which we call *approaches*, and then we describe briefly five studies that are used in this and later chapters as examples, especially for demonstrating how to evaluate a research study. These studies were selected to illustrate certain key concepts and issues, not because they were especially strong or weak. All studies, including our own, have weaknesses as well as strengths. There are almost always trade-offs made in conducting research so that few, if any, studies are strong in all aspects of their design.

In this book, all quantitative research is divided into three main types that we call *experimental*, *nonexperimental*, and *descriptive*. The first two types of

Researcher observation

When the researcher directly observes and records the behavior of the participants.

Mixed methods study

Research study which uses both qualitative and quantitative methodologies. Common in program evaluation research.

Pragmatic approach

Utilizing the best technique to answer a research problem/question.

Quantitative research

Group of research approaches that can be analyzed numerically.

research each have two approaches as shown in the following paragraphs. Unfortunately, some researchers use somewhat different terminology so we have a section at the end of the chapter labeled “Different Terms for Similar Concepts.” This section and the terms in our “key concepts” and “key distinctions” should help focus on important terms and keep them straight.

Experimental Research

1. The *randomized experimental approach* has *random assignment* of participants to the intervention and comparison groups and an *active* or **manipulated independent variable**.³ The scores of the groups on the *dependent variables* are compared.

Manipulated independent variable

See *Active independent variable*.

RESEARCH IN THE REAL WORLD

An Example of a Randomized Experimental Study (sample study 1)

The purpose of this study (Carnes-Holt & Bratton, 2014) was to investigate the use of Child Parent Relationship Therapy with adoptive families. The *active independent variable* in this study was the group and it had two levels, experimental and control. (Chapter 3 discusses variables and their levels in more detail.) The 39 females and 22 males were *randomly assigned* to one the groups. Because there was an active independent variable and the participants were randomly assigned to each group, the approach was *randomized experimental*.

The *dependent* or *outcome variables* were the behavior problems in the child, including total problems and externalizing problems (measured by the Child Behavior Checklist—Parent version, CBCL; Achenbach & Rescorla, 2000) and the parents’ empathy (measured by the Measurement of Empathy in Adult–Child Interaction, MEACI; Stover, Guernsey, & O’Connell, 1971). These are frequently used standardized measures with considerable evidence to support their *measurement reliability* and *measurement validity*.

All parents were administered the CBCL and MEACI at the beginning of the study. They were then video recorded playing with their adoptive child in a room filled with toys. Participants were then randomly assigned to one of the groups.

The participants in the treatment group were given Parent Child Relationship Therapy (CPRT; Landreth & Bratton, 2006), which is “an empirically based, manualized counseling intervention for children presenting with a range of social, emotional, and behavioral issues” (Carnes-Holt & Bratton, 2014, p. 329). Over 10 weeks, the participants in the intervention group attended a weekly 2-hour support group and also had supervised play sessions with their children. After the 10 weeks, participants in both groups were administered the CBCL and MEACI. Thus, this was a *pretest–posttest, randomized experimental design*.

We will discuss aspects of the method and the results more in later chapters, but it will suffice here to say that the participants in the intervention group experienced more decrease in the children's problem behavior and their externalizing behavior problems than those in the control group. Furthermore, the participants in the intervention group had an increase in their total empathy.

2. The *quasi-experimental approach* has an *active independent variable* but *without random assignment* of participants to groups. Again, an experimental or intervention group is compared to a control or comparison group of participants.

RESEARCH IN THE REAL WORLD

An Example of a Quasi-Experimental Study (sample study 2)

This study titled "Transformational leadership: A quasi-experimental study" (Arthur & Hardy, 2014), evaluated the effectiveness of a transformational leadership intervention. A total of 3,973 infantry recruits in training participated in the study. The study is considered quasi-experimental because, although there was an active independent variable, the recruits were *not randomly assigned* to the two groups. The *active independent variable* was type of group, either intervention or control. The intervention group received four half day workshops on transformational leadership; vision, support, and challenge; motivation; and coaching skills. Furthermore, the intervention group was given support in the field to help them implement the concepts from the workshops. The *dependent variables* were training outcome, group task cohesion, and leader behaviors, which included inspirational motivation, appropriate role model, fostering acceptance of group goals, intellectual stimulation, contingent reward, and performance expectations. Overall, the intervention group increased their scores from pre- to posttest and the control group tended to decrease their scores from pre- to posttest.

Nonexperimental Research (Sometimes Called Observational Research)

1. The *comparative approach* also makes a comparison of a few groups on the dependent variables. However, the groups are based on an *attribute independent variable*, such as gender. In that case, males are compared with females.

RESEARCH IN THE REAL WORLD

An Example of a Non-experimental Study Using the Comparative Approach (sample study 3)

Economos (2014) compared graduate business students with education students in regard to their perceptions of professor pedagogical content knowledge, individualized consideration, student–professor engagement in learning, professor intellectual stimulation, and student deep learning. The *independent variable*, type of student, is an *attribute* that for this study had two levels: business and education. There were five *dependent or outcome variables* including professor pedagogical content knowledge, individualized consideration, student–professor engagement in learning, professor intellectual stimulation, and student deep learning. The approach was considered comparative because the main independent variable, type of student, was an attribute and had only a few levels or groups (business and education) that were compared on each of the dependent variables. The business and education students differed only on their perceptions of student–professor engagement in learning and deep learning, with the education students having higher scores, thus, having more positive perceptions.

2. The *associational approach*, sometimes called correlational, has two or more usually continuous variables for the same group of participants, which are related or associated. For example, an achievement test is correlated with family income. Again, the independent variable is an attribute rather than active.

Continuous variable

A variable that has an infinite (or very large) number of scores or values within a range.

RESEARCH IN THE REAL WORLD

An Example of a Non-experimental Study Using the Associational Approach (sample study 4)

Tomko and Munley (2013) conducted a study to better understand psychologists' attitudes and judgments towards older adults. The study is considered to be associational because there was no active independent variable or treatment, and all of the variable scores vary widely from low to high so could be considered to be essentially continuous. The *attribute independent* or predictor variables were age, training in aging issues, fear of death, and multicultural competence. The *dependent* or outcome variable was the attitude toward older adults. All of the **predictor variables** were related to the dependent variable therefore they could be used to predict the psychologists' attitude toward older adults.

Predictor variable

See *Independent variable*.

Descriptive approach to research

Approach which answers descriptive questions using only descriptive, not inferential, statistics; summarizes data from the current sample of participants without making inferences about the larger population of interest; no comparisons or associations are made; does not have an independent variable.

Descriptive Research

We use the term *descriptive approach* to refer to research questions that use only descriptive, not inferential, statistics. **Descriptive statistics**, such as averages and percentages, summarize data from the current sample of participants without making inferences about the larger population of interest. In the descriptive approach no formal comparisons or associations are made. *Qualitative research* could be classified as one type of descriptive research using this definition and framework. This distinction between what we call the descriptive approach and the other four approaches is unusual, but we think it is educationally useful, in part, because the term *descriptive* is used in a consistent way.

RESEARCH IN THE REAL WORLD

An Example of a Purely Descriptive Study (sample study 5)

The study by Oliveira et al. (2013) described survey results of 415 undergraduate medical students in Brazil regarding their engagement with research. No formal structure or course was available at this institution for these students to conduct research; instead, if the students were interested in research, they had to search out professors who would work with them. There were *no independent variables* or *dependent variables* reported in this study because all of the variables are reported independently. Likewise, *no comparisons* or *associations* between variables were reported. What was asked and reported were various aspects (variables) of the participants' perceptions of research, for example obstacles to participation, information provided by teachers, and whether having a specific time for research would be beneficial. Participants who reported having experience with research were asked additional questions, for example reasons for participating in conducting research, reasons for choosing a teacher with whom to work, expectations for conducting research, and whether they received a grant. Finally, a subgroup of participants who reported completing at least one research project were also asked questions such as the duration of the project, if the results were published, and if they would recommend conducting research to other students. Most of the participants showed interest in participating in research, although less than half had participated in a project. Although only the descriptive statistics were reported in this article, comments from open-ended questions were included for clarification.

It is important to note that **most studies, especially complex ones, use more than one of these approaches** because "approaches" really refer to *types of research questions*, not necessarily whole studies. **A single study usually has more than one research question; for example, "survey studies" often have descriptive as well as comparative and associational research questions.** Experimental studies often also include an important attribute independent

variable such as gender and, thus, include a comparative question. Of the hundreds of studies that we have evaluated, all fit into *one or more* of these five categories based on their research questions and data analysis. Chapter 4 describes these approaches in more detail.

There are several reasons to categorize research questions into one of the five approaches. First, we feel that questions of *cause and effect* can be answered best with well-controlled randomized experiments and to a lesser extent with the quasi-experimental approach. Neither the comparative nor the associational approach is well suited to demonstrate cause and effect, but we realize that some statistics, such as linear regression or structural equation modeling, may provide some evidence for causality from nonexperimental studies. If a study is nonexperimental or descriptive, it rarely provides strong information about cause and effect, but it may provide suggestions about related variables, effective clinical practice, and *possible* causes.

Second, our classification of research approaches and Figure 1.1 should help the reader follow the research process from the *general purpose* of the research to the type of *research question* or **hypothesis**. For example, the *experimental, quasi-experimental, and comparative approaches* typically compare two or a few groups. On the other hand, the *associational approach* typically associates or relates variables for participants in a single group. The *descriptive approach* summarizes data using *descriptive statistics* such as averages, percentages, and various graphs.

Hypothesis
See *Research hypothesis*.

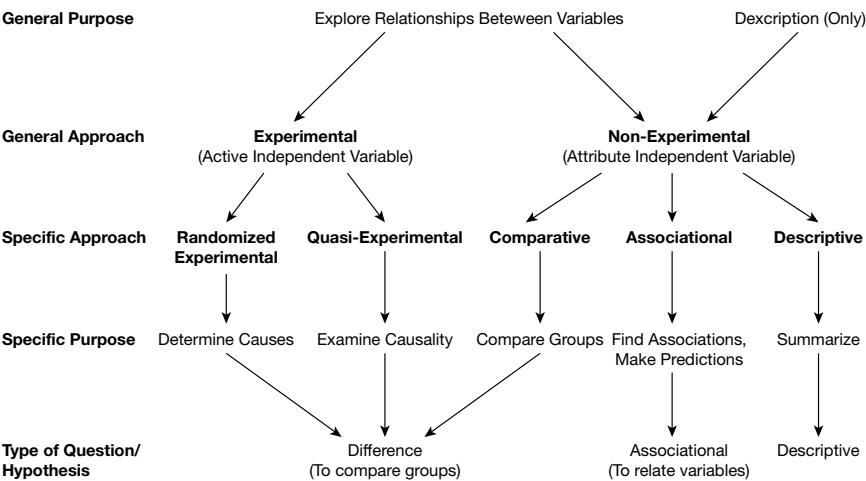


FIGURE 1.1
Schematic Diagram of How the General Type of Research Question Corresponds to the Purpose and Approach of the Study.

Summary

We equate research and “disciplined inquiry,” which must be conducted and reported so that it can be carefully examined. Inquiry is a systematic investigation of a matter of public interest. All research must be conducted and reported so that it can be tested and verified by others.

There are two main purposes of research: (1) to increase knowledge within one’s discipline; and (2) to increase knowledge within oneself, as a professional consumer of research. To increase knowledge within a discipline, research may expand the theoretical basis of the discipline, test the effectiveness of practical applications, or develop research tools. Research skills are necessary for one to be able to examine and evaluate the existing research in one’s discipline.

Six research dichotomies are discussed: (1) theoretical versus applied; (2) laboratory versus field; (3) participant report versus researcher observation; (4) quantitative/postpositivist versus qualitative/constructivist philosophical or theoretical framework; (5) quantitative/objective versus qualitative/subjective data and data collection methods; and (6) quantitative/statistical versus qualitative/descriptive data analysis. Although qualitative data are often collected within the constructivist paradigm, that is not exclusively the case. Furthermore, qualitative data and data analysis can be used within the post-positivist paradigm. The six dimensions or dichotomies are somewhat related in practice, but conceptually they are independent. This means that it is possible for a study to fit any combination of these six dichotomies.

Philosophically the postpositivist and constructivist paradigms are quite different, yet the two may be found together in one research study. When the two paradigms can be blended so that one paradigm sets the stage for or leads to the other paradigm the approach is called mixed methods. The pragmatic approach is a new approach that shows promise for social and therapeutic science research that combines qualitative and quantitative methods focusing on methodological rather than philosophical concerns.

We categorize research questions into five types or approaches: randomized experimental, quasi-experimental, comparative, associational, and descriptive. The approach and the **independent variable** and dependent variables for each of five sample studies were described briefly.

Independent variable

A variable that is presumed to affect or predict the value(s) of another variable; may be active or attribute; also called predictor variable.

Key Concepts

The concepts and distinctions listed next are discussed in this chapter, and the concepts are defined in the glossary. It will help you learn the material if you understand the meaning of each concept and can compare and contrast the concepts listed under key distinctions.

- Associational approach
- Comparative approach
- Descriptive approach
- Disciplined inquiry

Mixed methods
 Pragmatic approach
 Quasi-experimental approach
 Random assignment
 Randomized experimental approach
 Theory and theory development

Key Distinctions

Active independent variable versus attribute independent variable
 Independent or predictor variable versus dependent or outcome variable
 Laboratory versus field research
 Postpositivist versus constructivist paradigm/theoretical framework
 Producing knowledge versus understanding research as a consumer
 Quantitative versus qualitative data analysis
 Quantitative versus qualitative data and data collection
 Participant report versus researcher observation
 Theoretical versus applied research

Different Terms for Similar Concepts⁴

Active independent variable ≈ manipulated ≈ intervention ≈ treatment
 Associational approach ≈ correlational ≈ survey
 Attribute independent variable ≈ measured variable ≈ individual difference variable
 Comparative approach ≈ causal comparative ≈ ex post facto
 Comparison group ≈ control group
 Continuous variable ≈ normally distributed ≈ interval scale
 Dependent variable ≈ DV ≈ outcome ≈ criterion
 Descriptive approach ≈ exploratory research
 Difference questions ≈ group comparisons
 Independent variable ≈ IV ≈ antecedent ≈ predictor ≈ presumed cause ≈ factor
 Levels (of a variable) ≈ categories ≈ values ≈ groups
 Measurement reliability ≈ reliability ≈ test, instrument, or score reliability
 Measurement validity ≈ test, instrument, or score validity ≈ validity
 Nonexperimental research (comparative, associational, and descriptive approaches; some writers call all three descriptive) ≈ observational research
 Randomized experiment ≈ true experiment ≈ randomized clinical trial ≈ randomized control trials ≈ RCT
 Research validity ≈ validity of the whole study

Interpretation Questions

1. Explain the similarities and differences among the four main purposes of conducting research.
 2. In your own words, define “research.”
 3. Explain the differences between the randomized experimental approach and the quasi-experimental approach.
-

Application Problems

The application problems at the end of each chapter require you to apply the information from in the chapter and sometimes from preceding chapters. If you learn to apply the material, you will become a good consumer of research and a better researcher.

1. The chapter introduced several research dichotomies (i.e., theoretical versus applied, laboratory versus field, participant-report versus researcher observation, and quantitative versus qualitative paradigms). Identify the appropriate end of each of the six dichotomies for each of the following examples. (Remember that some research projects might use both ends. For instance, many projects incorporate both quantitative and qualitative data collection methods; others may use both participant-report and observational measures.)
 - a. To improve therapy, a researcher was interested to know whether there were differences in the physiological arousal of men and women during arguments. She recruited 30 couples and asked them to come to the Happy Family Counseling Center. Couples were comfortably seated in an attractively decorated room. The researcher placed heart rate and blood pressure monitors on each person in the couple. They were then instructed to identify and discuss a problem area in their relationship for 20 minutes. The researcher recorded the heart rate and blood pressure for each individual to determine whether there were differences between men and women in her sample.
 - b. A researcher was interested in learning which characteristics of marriages were based on equality to help couples adjust. She also wanted to learn what the benefits and costs of equality were for women and men. She interviewed couples in their home for 3 hours, asking them open-ended questions about previous relationships, about their marriage, about the evolution of their attitudes, feelings, and behaviors, and about descriptions of how they handled conflict, intimacy, children, jobs, and lifestyle issues. To analyze the data, she coded the conversation according to common themes that emerged from the interviews.
 - c. A model was developed to explain a family’s response to a stressful event. More specifically, the model was developed to explain a

family's adaptation over time given several variables such as the nature and degree of a stressor and the family's resources. **A researcher is interested in determining whether this model applies to a particular catastrophic event—the loss of one's home to an environmental catastrophe.** The researcher recruits families from a town that recently experienced an earthquake. Members of these families are asked to complete questionnaire measures of particular variables (e.g., family resources, perceptions of the stressor event); these measures have been used in prior research about the model.

2. A researcher was interested to **learn how the work environment influences employees' experience of work–family conflict**, or the degree to which their work responsibilities impinged on their home responsibilities and vice versa. The researcher gained permission from several company presidents to collect data from company employees.
 - a. Describe how the researcher might proceed if this were field research. What if it were done in a laboratory?
 - b. How might the researcher use qualitative data collection methods to gain information? How might she use quantitative data collection methods?
 - c. Describe how she might use participant-report measures to gather certain information. What about observational methods?
 - d. Would this research be applied or theoretical?
3. A researcher is interested to learn the qualities of and strategies used by dual-earner couples who are successful in balancing work and family responsibilities. He asks each member of the couple to complete several measures of variables that they believe will be particularly relevant, such as creativity, optimism, and self-esteem. He also plans to interview each couple to learn about their strategies for balancing work and family. These interviews will begin with the question: "What is it about you or your life that you believe most leads to your success in balancing work and family?"
 - a. Which of the aforementioned methods for collecting data is quantitative? Which is qualitative?
 - b. If the researcher uses qualitative methods of data analysis for the interview, how might they conduct this analysis?
4. A recently hired president of a university is committed to increasing the number of minority students who graduate with their bachelors' degrees. The president calls to arrange a meeting with you. In this meeting, the president explains that she wants you "to do some research on this topic." She explains that she is aware of other universities that have set and achieved this goal in prior years. She is also aware that this university has developed several programs in prior years in the effort to reach this goal. She wants you to provide her with information that will help her design specific initiatives that are most likely to produce the results she wants. Is the president asking you to be a consumer or producer of knowledge? What kind of skills must she believe that you have?

Notes

1. Although we believe that the term *positivist* is not an accurate label for most quantitative social scientists, the term is commonly used by qualitative/constructivist writers when describing researchers who use quantitative methods. Instead of referring to positivists, Phillips and Burbules (2000) call this paradigm *postpositivist*, and so do we. Likewise, the term *constructivist* may not be the best identifier for what is often called the *naturalist* or *qualitative* paradigm, but, again, it helps make important distinctions.
2. Note that some research methods texts use the phrase *qualitative data analysis* to mean the analysis of categorical or nominal data, including inferential statistics such as chi square.
3. A **variable** is a characteristic of a person or situation that has two or more values (it varies) *in a study*. An **active independent variable** is one such as a treatment, workshop, or other intervention that is given to one group of participants and withheld or given in another form to another group. An **attribute independent variable** is one that is not given or withheld in the study. It is a measure of a characteristic or attribute of the person or his or her situation. The **dependent variables** in a study are the outcome; they are presumed to measure the effect of the independent variable (and, thus, to depend on it). Variables are discussed in more detail in Chapter 3.
4. Terms are listed alphabetically. The term we use most often is listed on the left. Similar terms (indicated by ≈) used by other researchers or by us are listed to the right.

Dependent variable

A variable assumed to measure or assess the effect of the independent variable; thought of as the presumed outcome or criterion of the independent variable; also called outcome variable.

2

Planning a Quantitative Research Project

Quantitative research begins with a step-by-step plan of how the research will be conducted. This plan becomes the map of how the study will take place. Thus, it is extremely important to consider all aspects of the research study, from beginning to end, when organizing the research plan. This chapter outlines the quantitative research plan, utilizing Figure 2.1 as a guide. Specific chapters that present information on each of the steps of the plan are delineated in the figure. The present chapter will focus on steps 1 and 2 in the figure: the research problem and literature review. The other steps in the figure will be discussed in depth in later chapters.

Overview of the Steps in the Research Plan

One of the hallmarks of quantitative research is *a priori planning*, which means that a plan is made prior to the study. The steps of the plan for a quantitative research study are basically linear; thus, the first step is completed before going on to the next. Traditionally, the quantitative process is based on the scientific method, which includes ten steps relevant for education, health, and human service disciplines. These steps, shown in Figure 2.1, will be discussed briefly.

A priori planning

A plan for the research process made prior to the study.

1. The first step involves identifying the research problem. This initial stage involves choosing a question that has the potential to become a researchable project. Where does the problem come from? For many, especially those in applied disciplines, the problem often comes from a clinical situation. Will a particular type of therapy lead to improvement? Will adaptive technology increase communication skills? Will a particular assessment yield the information I need? Another place from which research problems may arise is the previous literature. A published study may help to formulate questions leading to a new study.
2. The second step is to conduct a review or synthesis of the literature relevant to the research problem. The last part of this chapter discusses the literature review.

→ - Clinical situation
- Previous literature

Literature review

An interpretation of a selection of documents (published or unpublished) on a specific topic that involves summarization, analysis, evaluation, and synthesis of the documents.

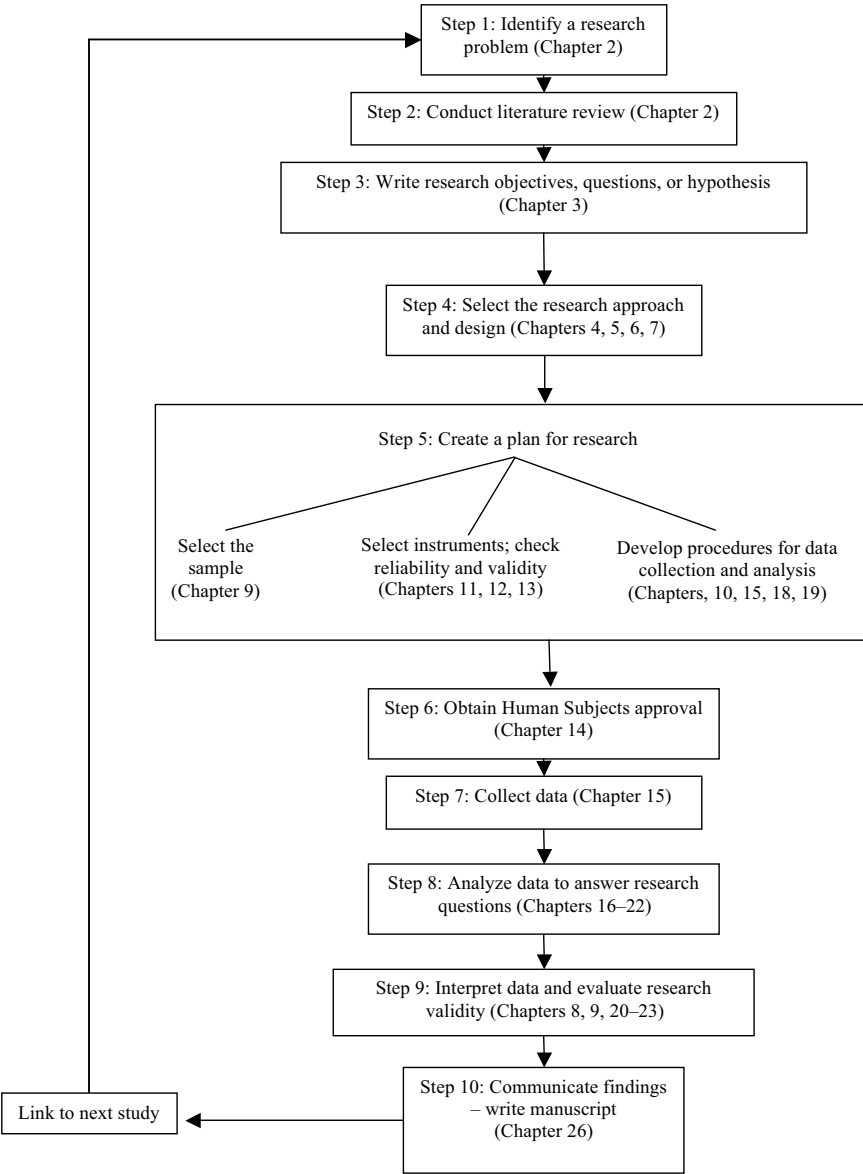


FIGURE 2.1
Steps in the Research Process for a Quantitative Study and the Chapters that Present Information on the Topic.

3. Next, the researcher **develops hypotheses or research questions**. In essence, this involves **reducing the research problem to specific research hypotheses or questions that are testable**. This step is discussed in Chapter 3.
4. The next step is **developing a research approach** (such as randomized experimental) **and design** that allows the investigator **to test the hypotheses**. The major focus of the research design is to allow the investigator to control or eliminate variables that are not of direct interest

- to the study but might affect the results. The design allows the investigator to directly test or answer the research question. Approaches and designs, briefly discussed in Chapter 1, are discussed in detail in Chapters 4–7.
5. Next, create a plan for conducting the research, which includes selecting the sample, selecting or developing the instruments, and developing procedures for data collection and analysis.
 6. Approval from the human subjects Institutional Review Board (IRB) must be obtained prior to data collection. This is discussed in Chapter 14.
 7. The next step involves data collection. Researchers attempt to collect data in an unbiased and objective fashion. In the traditional method, the scientist does not examine the data in detail until the study has been completed (see Chapter 15).
 8. The data, which are usually numbers, are then analyzed using inferential statistics as discussed in Chapters 16–22.
 9. The next step involves making inferences or interpretations from the data. These interpretations are based on the statistical analyses related to the hypotheses or research questions as discussed in Chapters 20–22. The validity of the methods and analyses are evaluated using the information in Chapters 8, 9, and 23–25.
 10. Finally, the findings must be communicated to the profession via a published manuscript and/or professional presentation as discussed in Chapter 26.

This example of the research process is in the form of a feedback loop. After the last step, a new research question is asked. If the hypothesis was confirmed, then a new question could be asked toward gaining additional information. If the hypothesis was not confirmed, the new question may be a modification of the original question, or the methodology might be altered to re-address the original question.

It should be noted, however, that quantitative research often varies somewhat from this idealized format. That is, in practice, the scientific approach is *not as deductive* (literature/theory → deduce hypotheses → test hypotheses) or *as rigid* as implied by the ten steps. For example, interesting findings that were not based on the original hypotheses often emerge during the project or at the data analysis stage.

The first two steps (a) identifying a research problem, and (b) conducting a literature review, are discussed in this chapter. The remaining steps will be discussed in more detail in the next chapter and throughout this book. For each step, the specific chapter(s) that discuss the topic are specified in Figure 2.1. Creswell (2014) provides a useful discussion of the research process for quantitative, qualitative, and mixed methods research studies.

Research Problems

The research process begins with a problem. What is a **research problem**? It is usually a sentence or *statement about the relationship between two or more variables*. Some studies such as the Oliveira et al. (2013) article on undergraduate medical

students' views of conducting research (see Chapter 1) are purely descriptive and do not *formally* examine the relationship among the several variables in the study. It is important to point out that almost all actual research studies have more than two variables. Kerlinger (1986) suggests that prior to the problem statement "the scientist will usually experience an obstacle to understanding, a vague unrest about observed and unobserved phenomena, a curiosity as to *why something is as it is*" (p. 11).

Three Sample Research Problems

Next, each of the three authors of this text describes the process that they experienced in formulating a research problem. When deciding on a dissertation topic, N. L. L. was interested in what makes a counselor "good" in the perception of clients:

At the time, I was working as a supervisor of master's degree students who hoped to become counselors. There was anecdotal information available from clients about counselors in the field: some were considered excellent and received many referrals, other counselors were considered marginal, and then a few were considered not good. How these differences between counselors were identified was not apparent. After looking into the literature, I found very little extant research on the topic; in fact, there was so little research that the problem would need to start with *what is the definition of "good" when it comes to counselors?*

After doing much reading, I realized that I was mainly interested in how potential clients chose a counselor. Once again, there was very little research in this area. I did find literature on willingness to seek counseling. The research in this area had been conducted mostly with undergraduate students. I thought it would be interesting to find out the level of willingness to seek counseling for counselors in training. There was an existing model in the literature that explained most of the variance of willingness to seek counseling for undergraduates; I wondered if this model would fit for counselors in training. Thus, my examinations into the research lead me to the research problem of *Does Cramer's (1999) model of willingness to seek counseling fit for counselors in training?*

Another example comes from J. A. G., who was working in the area of environmental physiology:

I was to give a talk at the Federation of American Societies for Experimental Biology. There were many well-known scientists at my talk, and I was nervous to say the least, especially because I felt that others in the audience knew more about my topic, regional distribution of blood flow during alcohol intoxication, than I. During the talk immediately preceding mine, a colleague sitting next to me asked how I felt. I answered that I felt fine but took my pulse and found my heart to be beating at a rate of about 110 beats per minute, considerably above my normal resting heart rate of 60 beats per minute but similar to my rate after moderate exercise. I wondered if this could be a healthy response. I first formulated my problem as *could a high heart rate in the absence of exercise be normal?*

Next, I found numerous studies that examined heart rate under conditions producing anxiety. The heart rate could get exceedingly high, much higher than mine had been. None of the previous studies examined the metabolic requirements (e.g., oxygen uptake and cardiac output) under these anxiety situations. On the other hand, several studies had examined metabolic requirements on heart rate during exercise. These studies considered elevated heart rate following exercise to be normal, since the heart must deliver an increased amount of oxygen to the tissues under higher metabolic demands. The problem now became a general question: *If we measured the metabolic demands of a situation under anxiety would it be similar to a situation under exercise?*

Now an obstacle became clear. How could we create two situations, one under anxiety and one under exercise that yielded similar heart rates? In order to remove this barrier, we decided to use a *within-subjects design*, where each participant took part in all conditions of the study. First we could determine the heart rate and metabolic requirements under an anxiety-provoking situation (e.g., prior to giving a talk). Next we could have the participant exercise on a treadmill at a workload high enough to give us a heart rate identical to that experienced under anxiety, and we could also measure metabolic requirements.

Now we could state our problem as *how are heart rate and metabolic requirements related under conditions of anxiety?* Our next step would be to change the problem statement into a prediction statement or *hypothesis* that could be directly tested.

The third example is a research problem faced by G. A. M. and his colleagues who were studying the motivation of infants to solve problems:

We had observed that infants who were born prematurely and also those who had been abused or neglected seemed to have lower motivation to master new skills and seemed to get less pleasure from trying. This clinical observation raised several issues. First, *could the motivation of preverbal infants be measured?* Achievement motivation in adults and older children had been assessed from stories they told in response to ambiguous pictures. Some other method would need to be developed for infants. Second, was it really the case that premature and abused or neglected infants were less motivated to master tasks? The second part of the research problem might be phrased as *is there a relationship between prematurity, abuse, or neglect and mastery motivation?*

Sources of Research Problems

The examples just discussed illustrate four common sources of research problems: *the existing research literature, theory, personal experience, and clinical observation*. The last two assume knowledge of the literature and theory in the field and the ability to relate it to the experiences or observations. Often experiences at work or school can be the source of a research problem, if you know what questions are unanswered at present and how to translate your unrest about incongruous phenomena into a testable research problem.

Clinical observation

In research, practice observation(s) that leads to a research problem or question.

RESEARCH IN THE REAL WORLD

In sample study 1, Carnes-Holt and Bratton (2014) investigate a type of therapy with parents of adoptive children and present a research problem based on existing research literature. They state, “Barth et al. (2005) argued that the parent–child relationship is the primary reason that adoptive parents seek counseling” (p. 330). These authors are basing their study on the extant literature.

An important distinction that is sometimes confusing to students is that the word *problem* might convey the false impression that a research problem is the same as a personal or societal problem. These types of problems, however, *may lead to* research problems and questions or hypotheses that can be answered by collecting and analyzing data. For J. A. G. to worry that he would be nervous during his presentation is not a research problem. Likewise, for G. A. M. to be concerned about the apparent low mastery motivation of abused or neglected children is a societal but not a research problem.

One of the first steps in the research process is to read the *research literature* on and around the topic of interest so that you will be able to identify gaps in knowledge. We provide some advice about conducting the literature review later in this chapter.

Another source for research problems is *theory*. Kerlinger (1986) suggested that a **theory** explains natural phenomena, which is a goal of science, and he defined it as, “A theory is a set of interrelated constructs (concepts), definitions, and propositions that present a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting the phenomena” (p. 9). Most researchers suggest that a theoretical orientation should be presented at the beginning of an article as the basis for understanding the rest of the article, but we do not believe that a theory *must* be a part of the article; instead, explanation, rationale, or point of view could be substituted and satisfy, to some extent, the same purpose as theory. However, none of these concepts are as strong as a theory. A number of books deal extensively with the role of theory in research, but we have chosen to emphasize research design and how it influences data analysis and the interpretation of results.

The issue in contemporary social and health science research is not so much whether theory is important and how it should fit into an article but how important should theory be in designing research. We agree that theory is important and that the value of the results of a study depend, in part, on whether they support some theory.

Theory

A statement or group of statements that explains and predicts relationships among phenomena; a set of interrelated concepts, definitions, and postulations that present a systematic view of phenomena by specifying relations among variables.

Identifying Research Problems in the Literature

All published studies start with a research problem. Unfortunately, in many published research studies, the research problem is difficult to identify in one sentence or paragraph. It is common for authors to allude to the problem instead of outright stating the problem. Furthermore, due to the pressure to

integrate extant literature into introductions of research studies, many times it is impossible to discern how a research problem was identified; often, the research problem appears to have emerged from the **existing literature** based on how the information is presented.

Existing literature

That which has already been written about the topic or question to be studied; provides the basis for the literature review section.

RESEARCH IN THE REAL WORLD

An example of a research problem apparently stemming from personal experience is from Landrum and Mulcock (2007). These authors state their research problem as the following: “As the undergraduate psychology major continues to grow in popularity, the challenge to provide accurate advising information to large numbers of students also continues to grow” (p. 163).

Characteristics of a Good Research Problem

In addition to being grounded in the empirical (data-based) and theoretical literature and examining relationships between two or more variables, there are several other characteristics of a good problem. As indicated already, it should hold the promise of filling a *gap in the literature* or providing a *test of a theory*.

A good research problem should also be *stated clearly and unambiguously*, indicating the variables to be related. Often research problems start out too broadly or vaguely stated. Problems also should imply several research questions.

As just implied, a good research problem should be *testable* by empirical methods; it shouldn't be just a statement of your moral, ethical, or political position. You should be able to collect data that will answer the research questions.

Of course, the methods used must be *ethical* and consistent with the guidelines spelled out in Chapter 14. The problem also needs to be *feasible*, given your resources and abilities. Finally, it is desirable, especially for graduate students, to choose a problem that is of *vital interest to you* so that you can sustain the motivation to finish, often a difficult thing to do.

Another way of deciding on a good, appropriate research problem for a thesis or dissertation is to examine where it would lie on several dimensions. We provide three different dimensions on which to examine research problems.

Broad Versus Narrow

Previously, we stated that research problems often start out too broad. For example, “What factors cause low mastery motivation” is too broad and probably not a feasible problem. Remember that your time and resources are limited so practicality requires that you limit the scope of your problem. It is also important to realize that science progresses in small steps. Even big, well-funded research projects often raise more questions than they answer and usually address only a limited piece of a broad research problem. On the other

hand, you don't want the problem to be too narrow. For example, usually it should deal with more than a single, limited research question and two variables.

Widespread Versus Limited Interest

Widespread interest

A research question or hypothesis which is of interest to much of the profession/field of practice.

It might seem that you would want as many people (scholars and the public) as possible to be interested in your research. Certainly you should be interested, and it is a good strategy to pick a problem that is of interest to your advisor. You will get more and better feedback from your advisor and committee if they have interest in and knowledge about the area. It is also desirable to choose a topic that is of **widespread interest**, but some topics become almost faddish and have so many studies about them that it is hard to make a contribution. If you choose a topic that is currently very popular, it is also important to find recent unpublished literature by attending conferences, searching the Web and ERIC documents, and writing researchers who have recently published in the area to see if they have something new. It is hard to find gaps in the literature of a currently popular topic because a lot of work still may be in progress. This point overlaps with the next.

Well-Researched Versus Unknown Territory

Limited interest

Refers to the likely esoteric nature of the topic for a study, one which is of interest to a small and/or limited audience.

It is exciting to think that you might be the first one to explore an area. However, if that is the case, one might wonder why it is unexplored. Is the topic of very **limited interest**, as discussed already? Are there practical, ethical, or financial reasons? Is the topic too specialized or narrow? Of course, there are interesting and important topics that are relatively unexplored and are not faced with these objections, but they are not easy to identify. Quantitative researchers tend to place considerable emphasis on finding gaps in the literature so they tend to study relatively well-researched areas. Qualitative researchers, on the other hand, place less emphasis on finding literature ahead of time and tend to explore less well-researched topics, seeing where their observations lead them.

Frameworks for Stating Research Problems

A common definition of a research problem is that it is a statement that asks what relationship exists between two or more variables, but most research problems are more complex than this definition implies. The research problem should be a broad statement, perhaps using summary terms that stand for several variables, that covers several more specific research hypotheses or questions. Several ways to state the research problem are provided in the next section. We have used square brackets to indicate where one should fill in the appropriate name for the variable or group of variables.

Format. One way that you could phrase the problem is as follows: The research problem is to investigate whether [put independent variable 1 or group of variables here], [independent variable 2, if any, here], and [independent variable 3, if any] are related to [dependent variable 1, here], and [dependent variable 2, if any] in [population here].

All studies have several variables; except in a totally descriptive study, one or more usually are called independent or predictor variables and one or more are dependent or outcome variables. There can be two or more of each, and there often are. In the statement of the problem, in contrast to the research questions/hypotheses, it is desirable to use broad descriptors for groups of similar variables. For example, demographics might cover several variables such as gender, mother's education, and ethnicity. Course performance might include scores on lecture-based test items and on text-based items. Likewise, attitudes could refer to more than one variable. Concepts such as self-esteem or teaching style have several aspects that usually result in more than one variable.

Examples for How to Phrase a Research Problem. If your study uses the randomized experimental approach, you could phrase the problem as:

1. The research problem is to investigate the effect of child parent relationship therapy (CPRT) with adoptive families (as in sample study 1).

For studies that compare groups or associate/relate variables, you could phrase the problem as follows:

2. The problem is to investigate whether graduate students in business and education differ in regard to their perceptions of professor pedagogical content knowledge, individualized consideration, student-professor engagement in learning, professor intellectual stimulation, and student deep learning (as in sample study 3).

If you have several *independent variables* and want to predict some outcome, you could say:

3. The problem is to investigate the background and demographic variables that predict or *seem* to influence counseling psychologists' attitudes toward older adults (as in sample study 4).

This latter format is especially useful when the approach is a complex (several independent variables) associational one that will use multiple regression.

Review of the Literature

Of all the steps in the research process, reviewing the literature is one of the most important due to it being the fundamental step that can ensure a rigorous and meaningful research design and results (Boote & Beile, 2005). Research reviews are necessary in the research process for a number of reasons, including to (1) identify gaps in the literature; (2) help to select appropriate methods for your specific topic; and (3) describe the inferences that have come from past research. This list is not exhaustive, as literature reviews can assist researchers in multiple domains to conduct rigorous, important, and meaningful research.

It is important to remember that research literature reviews are not without bias. When conducting reviews, researchers choose what journals to read, how many studies to read, and on which research studies to focus. Furthermore, researchers evaluate each study as to its importance and rigorousness. According to Dellinger (2005), “A review of the literature tells the researcher’s own story about what was deemed valid, worthwhile, meaningful, and valuable in a set of studies and how those studies fit together” (p. 44). Thus, it is necessary to keep in mind that your bias as a researcher will influence your literature review.

Definition of the Literature Review

There are many definitions of a literature review. Most definitions are not comprehensive; thus, we agree with the definition of literature review from Onwuegbuzie, Collins, Leech, Dellinger, and Jiao (2005, p. 7):

We define the literature . . . as an interpretation of a selection of published and/or unpublished documents available from various sources on a specific topic that optimally involves summarization, analysis, evaluation, and synthesis of the documents. The literature review interpretation results from systematic study of these sources culminating in qualitative and/or quantitative measurement of the quality, characteristics, and validity of the body of reviewed sources.

This definition of a literature review is beneficial due to its emphasis on summarization, analysis, evaluation, and synthesis. Each of these needs to be used when conducting a literature review. It is not enough to just summarize the literature; researchers need to read the existing literature with a critical eye and to analyze and evaluate the literature. Furthermore, literature reviews are not annotated bibliographies. Many students confuse annotated bibliographies with literature reviews. A literature review is more than just a list and summary of the existing literature; it requires a synthesis of the literature.

RESEARCH IN THE REAL WORLD

In sample study 4, Tomko and Munley (2013) provide a thorough review of the literature. The article starts out broad, discussing the growing number of older adults in the United States and the percentage of older adults who seek mental health counseling. Next, the authors present studies that have found evidence of ageism in mental health professionals and that therapy is effective and helpful for older adults. Funneling down the topic, research studies showing the damaging effects of mental health professionals’ negative perceptions of older adults are presented next. The final paragraph of this section introduces the variables associated with attitudes towards older adults. The authors then present four sub-sections exploring these variables. Finally, a paragraph presents the purpose and research question.

This last aspect of the process can be daunting for some students. Reading published literature reviews can assist novice researchers to learn how to do the synthesis.

Steps in the Literature Review Process and Ethics in Writing

There are many steps to the literature review process. The first step is to select a topic. Once a topic is decided upon, the extant literature can be searched (see the next section on Sources to Use in Literature Reviews for more information on where and what to search). After gathering and reading the literature, it is important to critically analyze each study. This is an important step as not all literature is good and helpful. For example, typically the literature used as a foundation for a research study should be other research studies, not opinion pieces. One way to identify whether a study is a research study is to look for a “method” section. Some find it helpful to highlight the sources, develop tables, or use index cards to organize the information. Think of this process as keeping notes on each source, its importance to the chosen topic, and its quality. Once a number of sources have been identified, searching through the reference section of each source can illicit more studies of interest. The final step is to write the first draft of the literature review. Remember that writing is a process, so there will most likely be multiple drafts before the final draft is written.

The literature review should be written starting out broadly and then funneling down the topic. Starting out broadly helps the reader to identify with the research problem. Utilizing the extant literature to narrow down the topic can lead the reader to understand the problem. If there are multiple variables in the study, it can be helpful to include literature regarding each variable. The final paragraph of the literature review is typically the purpose of the study and the research questions.

It is important to be ethical when conducting and writing literature reviews. Information from extant studies should not be taken out of context and all sides of the issues should be presented, even if it goes against what you are hoping to argue. Do not plagiarize other people’s work. Plagiarism includes using other people’s words without referencing them and presenting other people’s ideas as your own. Finally, be sure you are the only one writing the literature review. Other people can advise or provide feedback on your writing, but you should be the sole writer.

Sources to Use in Literature Reviews

When conducting a literature review, it is important to utilize all existing literature in the topic area. Unfortunately, in order to accomplish this, researchers usually need to utilize multiple databases. Additionally, all literature should be *considered* for inclusion, including published and unpublished work. Many dissertations and conference presentations are not published, but can assist researchers in increasing their understanding of what topics are currently being studied and what methods have been recently utilized.

Although all types of literature should be explored, caution should be used when selecting literature for *inclusion* in your final review. The most

trustworthy information usually can be found in journal articles that have been referred (reviewed for suitability for publication in a particular journal) by peers in the field. Some sources may have suspect information. For example, the Internet includes many helpful and trustworthy websites, yet, it also includes information that can be incorrect. It is helpful to check who the author of the source is (e.g., a website created by a professor affiliated with a research university probably would be more trustworthy than one created by a beginning student). Also, check to see whether the sources have been reviewed by someone other than the author.

Recently, open access journals have become available through the Internet. These journals provide full-text online articles to readers free of charge. Not all open access journals are peer-reviewed, so it is important to check this out prior to relying on their information. For a list of available open access peer-reviewed journals go to <http://doaj.org>.

There are other important considerations when deciding what literature to include in your final review. Whenever possible, use the *primary source* rather than a secondary source. An example of a *secondary source* would be a textbook that cites a research study. If you want to cite the research study, you need to read the actual research article and cite it, not the textbook. Reading the primary source is important because secondary source authors might have misinterpreted an article they cite. Occasionally, the primary source will not be available because it is out of print or in a foreign language. In that case, note that the study is reported “as cited in ____.”

It is important when conducting a literature review for a research study that the sources utilized be empirical, evidence-based research. There are many published articles, books, magazines, etc. that publish information about the author’s opinions, thoughts, and ideas, and these opinions might not have been based on well designed, empirical research. For example, a junior high principal may have had to change students’ schedule from a traditional one (e.g., seven classes each day) to a block schedule (e.g., five classes a day, with different classes offered on different days). The next year, the principal notices that the test scores have improved for his school. He then writes about this “finding” and it is published in a journal for school administrators. The problem is that there is not strong evidence that the change from a traditional format to a block scheduling format is *the reason* or cause for the change in test scores. Utilizing this type of literature can be misleading. If the article does not have reasonably complete sections describing the methods and results, it is not an empirically-based research article. If there is a description of the methods and results, one still needs to evaluate the quality (i.e., validity) of the design and analysis. We discuss these issues extensively in later chapters.

It is always important to include a literature review when writing a proposal or a research paper. Dissertations and theses usually have an entire chapter devoted to the literature review and these reviews are most commonly comprehensive, including all the key literature related to the topic and often providing a historical review.

In journal articles, literature reviews are usually short, due to the page or word restrictions of the journal. It is common for researchers to have conducted

Primary source

An original source of data, study results; preferred source for the literature review.

Secondary source

A source that provides non-original (i.e., secondhand) data and/or information.

extensive reviews of the literature prior to a study (to identify gaps in the literature, etc.). Yet, in the presentation of the research in a journal article, only the most pertinent and recent literature is included. For example, in an example associational study by Zamboanga, Padilla-Walker, Hardy, Thompson, and Wang (2007) all the cited research was published within the past 8 years and was summarized in about 700 words (2–3 typed pages). Yet another example is Carnes-Holt and Bratton (2014), our sample randomized experiment.

Locke, Spirduso, and Silverman (2007), Galvan (2013), and Fink (2013a) provide additional information about reading and understanding research and conducting literature reviews.

Summary

This chapter presents an overview of ten steps and a flow chart (Figure 2.1) for planning and conducting a quantitative research study. The steps in Figure 2.1 include:

1. Identify a research problem.
2. Conduct a research literature review.
3. Write research questions or hypotheses.
4. Select the research approach(es) and specific design.
5. Create a plan for conducting the research. This includes plans for: selecting the sample, selecting or developing the instruments, and developing procedures for data collection and analysis.
6. Obtain approval from the human subjects Institutional Review Board (IRB).
7. Collect the data.
8. Analyze the data.
9. Interpret the data.
10. Communicate the findings.

The focus of this chapter was on steps 1 and 2. Later chapters discuss each of the other eight steps in detail. Next we described the process each author went through in developing a research problem that we have studied. This was followed by a broader discussion of several sources of research problems: literature, personal experience, clinical observation, and theory. Next we described characteristics of a good research problem: testable, ethical, feasible, and of vital interest to you as well as the discipline. We included a discussion of frameworks for stating research problems. Finally, we discussed research literature reviews, what they are, the steps in the literature review process, ethics in writing literature reviews, what types of sources to use, and some issues and examples.

Key Concepts

Characteristics of a good research problem
Literature review
Research problems
Sources of research problems
Framework for stating research problems
Process for conducting a literature review
Ethics in writing literature reviews
Sources for literature reviews
Steps in planning research
Theory

Key Distinctions

Broad vs. narrow research problems
Existing literature vs. personal experience vs. clinical observation
Literature review vs. annotated bibliography
Primary source vs. secondary source
Well researched vs. unknown territory
Widespread vs. limited interest

Interpretation Questions

1. What are the ten steps in the research process?
 2. What are the characteristics of a good research problem?
 3. List the types of sources that are useful for a literature review.
 4. Why should the researcher be cautious about utilizing web sources in the literature review?
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Application Problems

1. What is the purpose of the literature review in a research study?
2. Why is it important to use primary sources rather than secondary sources in the literature review?
3. List three sources for the literature review—what are the advantages and disadvantages of each?
4. Why should the researcher be cautious about utilizing web sources in the literature review?

5. Why is it important to link theory to the research problem?
6. In this chapter, the authors each describe the process they went through to identify a research problem. For one of these three research problems, answer each of the following:
 - a. Is this a broad or narrow research problem? Explain.
 - b. Is this research problem of widespread or limited interest? Explain.
 - c. What topics in the literature might the researcher want to explore? Explain.
 - d. Rate the stated research problem on the different characteristics of a good research problem—support your answer.
7. For one of the five sample studies described in Chapter 1, answer each of the following:
 - a. Is this a broad or narrow research problem? Explain.
 - b. Is this research problem of widespread or limited interest? Explain.
 - c. Rate the stated research problem on the different characteristics of a good research problem—support your answer.