

## CHAPTER 3

# Foundational Issues

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## *Postpositivist and Critical Perspectives*

Traditional textbooks on research in the social sciences tend to fall into two broad but related categories: statistics and research methods. A great many texts are available that detail the statistical procedures that can be used to analyze quantitative data. *Basic Statistical Concepts* (Bartz, 1998) is a good example of this type of book. It introduces the general concepts of quantitative analysis and common concepts such as nominal, ordinal, interval, and ratio data. Then it covers a wide range of statistical concepts and techniques such as

- Frequency distributions and the standard curve
- Measures of central tendency such as mean, median, and mode
- Normative scores such as percentages, age and grade scores, and standard scores
- Measures of variability: range, standard deviation, variance
- Relationship tests such as correlation and regression
- Difference tests such as *t* tests and analysis of variance

Bartz's book also covers some *nonparametric* statistical procedures such as the Mann–Whitney *U*, and it devotes some attention to the design of research studies. However, it is primarily a book on standard or parametric statistics. Although it and books like it are regularly used to introduce students to social science research methods, it concentrates on one type of data: quantitative. However, the statistical procedures described in Bartz's book do not work well with interview data, with journals and life histories,

with observations in the field, and with case studies. It focuses on certain types of quantitative data.

### Parametric and Nonparametric Statistics

The statistical analysis of data is an integral part of research in every social science. The thousands of statistical procedures used by social scientists fall into two broad families: parametric and nonparametric. Parametric statistics are based on the assumption that the data being analyzed have a particular pattern, or distribution. Specifically, parametric statistics assume that most of the data points will be clustered in the middle. For example, suppose you gather data on extroversion, and the scores you obtain range from 10 to 90. If the pattern of scores is parametric, you would expect many of the scores to be in the middle of that range, say around 50, and that the number of scores would decrease as you move further away from that middle. Your data might have 120 scores around 60 but only 35 around 75 and just a few close to 90. Also, there might be around 120 scores near 40, far fewer around 25, and a very small number near the extreme lower end of the range of scores. This pattern is often called the normal distribution, often represented graphically as a bell-shaped curve.

If your data meet the criteria for parametric distributions, you can use parametric statistics to test hypotheses. For example, suppose you are studying the impact of a social skills training program on the “sociability” of people who complete the program. If you have an experimental and a control group, one of the things you will want to know is whether the sociability scores of the people in the experimental group who completed the training program are higher than the scores for similar people who did not participate in the training. If your data are parametric you can use a parametric statistic such as the  $t$  test to compare the average scores in the two groups. But what if your data aren’t distributed parametrically? What if, instead, most of the scores on the measure of sociability are near the bottom of a range of scores? Perhaps more than half of the scores are from 31 to 45, with 31 being the lowest score in your data and the highest being 145. This distribution of scores is not parametric. The distribution violates one of the assumptions of parametric distributions.

When you have a nonparametric distribution, there are two commonly used solutions. The first is to simply ignore the nonparametric nature of the data and use parametric statistics such as the  $t$  test anyway. Many researchers do, and quite a few studies show that parametric statistics are reasonably accurate even when there are violations of the assumptions. However, when the distribution of data grossly violates the assumptions on which parametric statistics are based, there is another option: nonparametric statistics. These statistics do not make assumptions about how the data are distributed. Therefore, they can be used with data that

have an odd or nonparametric pattern. A nonparametric equivalent of the  $t$  test, for example, is the Mann–Whitney  $U$  test.

You may be wondering why you would even try to use parametric statistics if there are nonparametric statistics that do the same job but don't have so many pesky assumptions behind them that are often violated by data gathered on humans. The answer is *power*. If the data are parametric in their distribution pattern, the  $t$  test will be able to detect differences between the two groups better than the Mann–Whitney  $U$ . If your treatment group has a mean of 45 and the control group had a mean of 39, a Mann–Whitney  $U$  test might not tell you that difference was significant, but a  $t$  test would. Therefore, researchers generally use parametric statistics whenever possible because they are usually more powerful. They use nonparametric statistics when the distribution of data drastically violates the assumptions that underlie parametric statistics. At a more personal level, I like nonparametric statistics because they tend to have more exotic names such as the Wald-Wolfowitz runs test, the Kolmogorov-Smirnov two-sample test, the jack-knife resampling method, and the bootstrap estimation method. They sound so much more exotic than parametric statistics such as the analysis of variance and the correlation coefficient.

Another common type of text used in research classes today is the method book. Paul Cheralnik's (2001) *Methods of Behavioral Research* is typical of this type. Instead of concentrating on statistical tests and procedures, a method book emphasizes design. The book attends to basic topics such as criteria for good research (e.g., internal validity, reliability, and generalizability or external validity). However, the bulk of the text introduces a range of research designs. In his book Cheralnik even organizes them according to their quality, based on a set of standards. He divides studies into three general families: preexperimental designs, true experimental designs, and quasiexperimental designs. In his value system a case study is a preexperimental design that rates very, very low on his set of criteria.

A bit further up the methodological food chain are quasiexperimental designs. They are often used in the social sciences for applied research because it is often impossible to meet all the criteria for a true experimental design. For example, in educational studies it is rarely possible to randomly assign subjects to treatment and control groups. In a true control group–experimental group study the subjects would be randomly assigned to either the control condition or the experimental condition. Those subjects would also represent the general population to which you want to generalize the results. When subjects cannot be randomly assigned to treatment conditions, the researcher often uses a quasiexperimental design instead. For example, you might use intact

groups such as students in eight existing classrooms. The use of intact groups violates the random assignment rule of traditional experimental research, and the study is thus quasiexperimental instead of experimental. Some research methodologists treat quasiexperimental research with disdain. However, the choice of using an experimental or quasiexperimental research design often involves balancing two important values: validity and meaningfulness. Suppose you are studying the courtship behavior of humans and you are concerned with whether adolescent males court females who are from their neighborhood differently from females from other neighborhoods. You could do a completely randomized experimental study using another species, such as *Drosophila* flies. Actually, this type of study has been done, and female flies respond differently to males from their immediate geographic area (homotypic or within strain) compared to males who are “not from around here” (heterotypic or between strain). In fact, the research in this area shows many differences in the courtship and mating patterns with “local” and “foreign” potential partners. For example, Long, Montgomerie, and Chippindale (2006) found that females who had already had sex with one partner “were significantly less likely to remate . . . if the second males they had the opportunity to mate with were from their local population than if those second males were from a foreign population” (p. 6). In trying to explain why this happened, the authors concluded, “It seems most likely that foreign males, or their courtship signals, were in some way more attractive to females than were local males, rather than that males expended more energy in courtship when they encountered unfamiliar females” (p. 9). Foreign males also had another advantage in that they

were 80% more successful than local males, on average, at maintaining sperm in the female’s reproductive tract following remating. . . . This finding suggests better sperm binding in the female reproductive tract by foreign males conferring resistance to either (i) the challenge of second male sperm and accessory proteins or (ii) lower sperm dumping . . . by females during remating. (p. 10)

This study involved several thousand flies that came from genetically controlled populations that had been “kept under identical environmental conditions for greater than 600 generations” (Long et al., 2006, p. 1). The experimental process was also tightly controlled: “Adult flies of both sexes were collected as virgins under light CO<sub>2</sub> anaesthesia as they eclosed from pupae on day 9. . . . Adults were allowed to mate and freely interact in the females’ natal vials for the next five days” (p. 3). The study was thus highly controlled in ways that would not be thinkable in a human population.

The purpose of this research was to contribute generally to the study of animal mating behaviors, but what if we try to apply the findings to humans? The study is very well controlled and is clearly an experimental rather than a quasiexperimental study. We can probably believe the results of this study, which means it has high *validity*. Is it also *meaningful* in the sense that we can apply the findings to human courtship and mating behavior? Clearly, meaningfulness of that sort is in question. Does research on flies kept in artificially controlled environments have a lot to say about human behavior “in the wild”? This is the big question, and different scholarly traditions answer it in diverse ways. My opinion is that although well-controlled cross-species research may add to the discussion, both qualitative and quantitative research on humans in natural environments may be more meaningful even if it is quasiexperimental or of some other type that is held in low esteem on the traditional hierarchy of research methods. In their somewhat critical commentary on contemporary research about sex differences and social behavior, Rabinowitz and Valian (2000) pointed out that many different research methods have been used, including experimental and quasiexperimental methods, qualitative studies of behavior in natural environments, and qualitative analyses of archival data. Rabinowitz and Valian use the example of research on jealousy to emphasize the importance of individual cognitive and social characteristics that may be overlooked in cross-species and purely experimental research. The available research indicates that “women are more likely than men to report distress at emotional infidelity; men are more likely than women to be upset about sexual infidelity” (Rabinowitz & Valian, 2000, p. 197). This suggests that the characteristics of jealousy may be sex-linked and genetically based. However, more detailed studies (that explore many issues best studied using qualitative research methods) found that an individual’s perception of the meaningfulness of an action is very important. “For men more than women, a partner’s sexual infidelity implies emotional commitment whereas for women more than men, a partner’s emotional infidelity means that sex is in the air. Most people choose as most distressing the type of infidelity that more implies the existence of the other” (pp. 197–198). In this finer-grained research, biological sex did not appear to be the core determinant of what was upsetting. Instead, it was the individual’s beliefs about how these two types of behavior (emotional infidelity and sexual infidelity) interact.

The issue of validity is a major one, but there are actually many criteria for a good research study in the postpositivist tradition, and very few studies in the social sciences meet all of them. Therefore, most of the quantitative studies you read will be quasiexperimental rather than true experimental studies.

The value system, the examples used, and the designs proposed in Cherulnik's book (and hundreds like it) are all based on a postpositivist paradigm that includes the assumption that the traditional scientific method is the only reasonable way to think about research. This is succinctly expressed in Cherulnik's (2001) introduction to research designs: "Every research study is a comparison between what happens under one set of conditions and what happens under another or a number of others" (p. 144). This position dominated social science research for much of the 20th century, and it is explored in this chapter.

### **Social Science Research: The View From the Postpositivist Paradigm**

The paradigms that will be discussed in this chapter and the next take distinctive positions on five issues:

- The nature of reality
- The purpose of research
- The methods of research and types of data that are acceptable
- The types of meaning achieved and the way meaning is derived from the data gathered
- The relationships between research and practice

These five issues are similar to the three Guba (1990) used to distinguish research paradigms: *ontological*, *epistemological*, and *methodological*. Table 3.1 summarizes the positions taken by the postpositivist paradigm and the older paradigm that it replaced, positivism.

**Table 3.1** Differences Between Positivism and Postpositivism on the Five Major Issues

	<i>Empiricism or Positivism</i>	<i>Postempiricism or Postpositivism</i>
Nature of reality	External to human mind	External to human mind
Purpose of research	Find universals	Find universals
Acceptable methods and data	<ul style="list-style-type: none"> <li>• Scientific method</li> <li>• Objective data</li> </ul>	<ul style="list-style-type: none"> <li>• Scientific method</li> <li>• Objective data</li> </ul>
Meaning of data	<ul style="list-style-type: none"> <li>• Mirror to reality</li> <li>• Use to develop theory</li> </ul>	<ul style="list-style-type: none"> <li>• Falsification</li> <li>• Use to test theory</li> </ul>
Relationship of research to practice	<ul style="list-style-type: none"> <li>• Separate activities</li> <li>• Research guides practice</li> </ul>	<ul style="list-style-type: none"> <li>• Separate activities</li> <li>• Research guides practice</li> </ul>

In the admittedly oversimplified comparison of positivism and postpositivism in Table 3.1, there are only two differences between these two paradigms. First, as regards the meaning of data, positivism takes the position that you can discover the way things really are by conducting scientific research. That is, if you do enough research and it verifies your theory, you can be confident your theory reflects the true nature of the world. This is sometimes called a *correspondence theory* of truth. Postpositivists, on the other hand, argue that you can never be sure that the next research study will not be the one that shows your theory is wrong (Popper, 1937). Thus, there is never enough research to permit you to eliminate all doubt about your theory. On the other hand, if one study produces data that contradict your theory, that is enough to falsify the theory. You then look for a better theory, or modify your current theory, in response to the falsification. This extreme version of falsification is not widely used today. Most researchers who work in the positivist or postpositivist tradition have adopted a modified falsification approach in which failures may result from a number of things—instrumentation, misinterpretation of the data, misapplication of the theory, poor sampling, and so on—and therefore do not always mean your core theory is wrong.

The other difference between these two paradigms is the relationship of theory to data. Positivism proposes that theory be derived from research observations. This “raw empiricism” assumes that you can collect objective data that are theory free and then use them to develop a theory. The data are “unpolluted” by theory. Postpositivists reject this assumption and accept that any collection of data is based on theory. Data and the interpretation of data are thus theory dependent. Postpositivists can develop a theory in any way they want; theory need not be based on data. However, they test their theories by doing scientific research.

Postpositivism has largely replaced positivism today in the social sciences, and the remainder of this section focuses on postpositivism. As you can see from Table 3.1, the purpose of postpositive research is the discovery of universals or laws. As Guba (1990) puts it, “The business of science is to discover the ‘true’ nature of reality and how it ‘truly’ works” (p. 19). The way those universal laws are to be discovered is by use of the scientific method. Again quoting Guba (1990),

Once committed to a realist ontology [e.g., the basic nature of the world is material], the positivist is constrained to practice an objectivist epistemology [e.g., we can come to know something only by experience in the real world, such as empirical research]. If there is a real world operating according to natural laws, then the inquirer

must behave in ways that put questions directly to nature and allow nature to answer back directly. (p. 19)

### **The Foundations of Postpositivist Research**

Most paradigm debate literature makes the assumption that the research being done is basic research on fundamental issues such as the nature of human learning or the truth about how children's cognitive development takes place. However, much of the research in the social sciences is applied rather than basic. Even though positivism and postpositivism were developed primarily to guide basic research, the majority of studies in the social sciences—basic and applied—are based on one of the variants of postpositivism. Although there is a difference between testing a broad general theory about how humans learn and comparing the success of two ways of teaching reading, research on these two questions, if it is based on a postpositivist paradigm, shares some critical elements. The most important probably is the tendency to look for truth. The goal of postpositivist research, basic or applied, is to find the truth about something. Postpositivists do not believe you can convincingly find truth with one study, but each study is part of a broader effort to get closer and closer to the truth through a series of research studies. That is one characteristic of postpositivist research that distinguishes it from other types. There are many others, and our discussion of them has been organized around the five basic or foundational issues discussed earlier.

#### *Nature of Reality*

All research grounded in this paradigm is based on the assumption that there is an accessible, external, physical reality. Accessibility does not necessarily come easily, however. In this paradigm many of the rules for research were developed to give researchers more confidence in their assertions about an external reality. For example, many areas of postpositivist research have developed very specialized jargon to allow researchers to use words to precisely and accurately describe the “real world.” That is one reason the language of the postpositivist researcher often differs from both ordinary or “street” language, and the language of practice.

Another reason postpositivists invest so much energy in trying to develop unambiguous language is the assumption that all problems can and should be clear cut. Reflecting the line of thought expressed by Newell and Simon (1972) on both the nature of real-world problems and how problems are formulated, postpositivist researchers assume that all meaningful



problems can be framed in clear-cut, unambiguous ways. That is why post-positivists require students to write very precise hypotheses for dissertation research. There are no fuzzy, ambiguous problems, only fuzzy ambiguous formulations of problems. And, likewise, the paradigm assumes there are clear-cut solutions to clear-cut problems. However, the problem must be properly framed before we can fruitfully search for a solution, and the search must be conducted in an objective, scientific manner. For example, it would not be appropriate for a postpositivist to begin a research study without knowing exactly what is to be studied and how the research will be conducted. You need precisely stated hypotheses and well-defined methods.

### Article of Interest

**Bruce A. Ryan. (1999, August). Does postmodernism mean the end of science in the behavioral sciences, and does it matter anyway? *Theory & Psychology*, 9, 483–502.**

Bruce Ryan is a psychologist at the University of Guelph in Canada. His article is about different definitions of reality and their impact on the discipline of psychology and on the social sciences in general. Ryan distinguishes between what he calls a modernist view of reality—that it is independently knowable and external to the knower—and a postmodernist conception that posits reality as something constructed by humans. Ryan traces the history of these two conceptions of reality from Plato and Aristotle to contemporary philosophers of science. He also devotes much of the last half of his article to the implications of adopting a postmodern definition of reality in the social sciences. Opinions vary, from the end of social science research as we know it, to the flowering of social science research in a new era of usefulness and impact. What is your view of the impact of adopting a postmodern view of reality in your field?

To read the entire article, please go to [http://www.sagepub.com/willis\\_aoi](http://www.sagepub.com/willis_aoi).

### *Purpose of Research*

With postpositivism, the search for universals is not limited to basic research. That search extends to applied research as well. As noted earlier, both the basic researcher studying cognitive functioning and the applied researcher studying methods of teaching reading may be looking for universals. The postpositivist paradigm searches for those universals:

beliefs, concepts, and ideas that can be applied to many different situations. Consider this question: Will teacher education students be more likely to use technology in their own classrooms when they graduate if their computer experiences in teacher education focus on developing strong basic operational skills or their computer experiences emphasize ways technology can be integrated into the classroom? Postpositivist research on this question would look for a general and universal answer. The purpose of research is to find universals that allow you to generalize across contexts.

### Article of Interest

**Frances E. Racher & Steven Robinson. (2003, August). Are phenomenology and postpositivism strange bedfellows? *Western Journal of Nursing Research*, 25, 464–481.**

Frances Racher is a nurse practitioner, and this article is a reflective analysis of her struggle with the paradigms she used to guide her research and practice. She is particularly concerned with postpositivism and interpretivism, especially phenomenology practiced within an interpretive framework. Whereas much of the literature takes the position that postpositivism and interpretivism are incompatible because they take radically different positions on topics such as the nature of reality and the purpose of research, Racher and Robinson argue that they are, in fact, quite compatible. How do they come to that conclusion? Do their positions on fundamental issues reflect the views of postpositivists? Interpretivists? Or do they manage to merge the two perspectives?

To read the entire article, please go to [http://www.sagepub.com/willis\\_aoi](http://www.sagepub.com/willis_aoi).

### *Acceptable Methods and Data*

Good research must meet the established, objective standards for both the design and the analysis of data. In the early 20th century a group of scientists in Vienna established the Vienna Circle, a solidly positivist group that argued there is one acceptable way of discovering the truth: the scientific method. Rudolph Carnap, one of the founders of the Vienna Circle, argued forcefully that all science, including social science, must use the same scientific method. His 1934 book *The Unity of Science* is a clear statement of this position. If standards for what constitutes good research are universal, they are the same for basic and applied research in all fields, from physics to anthropology to history.

In this paradigm the technical standards of good research are of paramount importance. If the technical standards are not met, the research does not warrant our attention. For the postpositivist the goal is objectivity and precise control of the research situation. The opposite, subjectivity, must be avoided at all costs.

### Article of Interest

**Stephen C. Yanchar & Jack R. Hill. (2003, January). What is psychology about? Toward an explicit ontology. *Journal of Humanistic Psychology*, 43, 11–32.**

Both positivist and postpositivist philosophies of social science emphasize the need to pay particular attention to the rigor of the research design. Yanchar and Hill point out that this has often resulted in *methodolatry*: the worship of research design over other important issues in the research process. They believe that the privileging of research method (e.g., a favored epistemology) has harmed psychology because the emphasis has let psychology drift along without a real subject matter of its own (e.g., it does not have specific answers for ontological questions). For example, some psychologists study observable behavior, others study cognition, and still others study the unconscious. As Yanchar and Hill put it, “We have no idea of what psychology is about” (p. 16). Furthermore, the level at which these topics of study are explained ranges from the chemical and biological levels to the social or group levels. The authors think this crisis in psychology should be redressed through an ontology of psychology that points to the topics that interest psychology as a discipline. Their solution begins with a rejection of much of the positivist framework. They then argue for the adoption of an alternative ontological position. What do you think of the position they adopt and the arguments they use to support it?

To read the entire article, please go to [http://www.sagepub.com/willis\\_aoi](http://www.sagepub.com/willis_aoi).

### *Meaning of Data*

Postpositivist research is based on a theory-first model. Before conducting a standard study, the researcher would develop specific hypotheses to be tested. In fact, the entire study would be planned in detail because the logic of this type of research calls for everything to be clearly and precisely stated before the data are collected. Ad hoc conclusions are viewed with suspicion. Through statistical analysis, data are interpreted relative to the implications of a theory. The theory comes first, then you conduct the research to test your theory.

*Relationship of Research to Practice*

Inherent in this paradigm is the assumption that research is a special activity that is quite different from practice. Professional practice is an inherently subjective activity. Thus, a teacher, psychologist, or urban planner will not be able to conduct good research as a part of professional practice. Research must be conducted under very stringent, well-controlled conditions by an objective researcher. Few practitioners work in settings where the requirements for good research can be satisfied (e.g., random assignment to groups, to name just one), and they are not objective about their students, patients, or clients. You must step out of the professional practitioner role in order to take on the role of researcher. In the researcher role you look for universals that, when found, can be communicated to others, who use them to guide practice. In the postpositivist paradigm, there is an inherent hierarchical relationship between research and practice. Research generates the rules of practice that practitioners are to follow.

**Article of Interest**

**Matthew O. Howard, Curtis J. McMillen, & David E. Pollio. (2003, March). Teaching evidence-based practice: Toward a new paradigm for social work education. *Research on Social Work Practice*, 13, 234–259.**

The postpositivist model of empirical research guiding practice is aptly expressed in the contemporary concept of evidence-based practice. Over the past decade this concept has gained in popularity so that there are organizations to promote evidenced-based health care, evidence-based education, and evidence-based just about everything else. This article, written by three professors of social work at Washington University in St. Louis, lays out a rationale for evidence-based social work practice and describes how students in the master's degree program in social work at Washington University are prepared to base their professional decisions on the best available empirical evidence. Compare the beliefs of these authors with those of Yanchar and Hill in the previous Article of Interest. How would the recommendations and suggestions be different in each article if the foundational beliefs of the authors were swapped?

To read the entire article, please go to [http://www.sagepub.com/willis\\_aoi](http://www.sagepub.com/willis_aoi).

**Examples of Postpositivist Research**

A good example of an applied postpositivist research study is the work of Waxman and Huang (1996). They asked whether “1) classroom interaction, 2)

selection of activities, 3) instructional activities, 4) organizational setting of the classroom, and 5) student on-task and off-task behaviors in the classroom significantly differ according to the degree of use of technology in mathematics classrooms” (p. 157). Such studies are conducted in many fields, from studies of different forms of psychotherapy to the impact of different medical treatments on a particular disease. Such questions have many practical implications, but they are also inherently theoretical questions. In this case the question is, “Does using computers in the classroom change important classroom patterns?” Waxman and Huang studied more than 2,000 randomly selected middle school students in a large school district. Trained observers visited the classrooms four times in one year. They used a well-validated and reliable classroom observation instrument to gather data on a wide range of student and teacher behaviors in the classroom. Waxman and Huang used part of the observation data to categorize classrooms into three levels of technology use: moderate, slight, and infrequent. Then they used multiple analysis of variance (MANOVA) and analysis of variance (ANOVA) procedures to analyze the rest of the classroom observation data. The results were interesting:

Instruction in classroom settings where technology was not often used tended to be whole-class approaches where students generally listened or watched the teacher. Instruction in classroom settings where technology was moderately used had much less whole-class instruction and much more independent work. (p. 157)

In their discussion Waxman and Huang also comment that the overall level of use of technology in the classrooms they studied was not high even though the school district had provided technology resources for the classrooms:

The mere presence of computers or any other type of instructional technology in the classroom does not mean that it will be effectively used. The results from the present study clearly indicated that the wide availability of technology in these mathematics classrooms did not ensure that teachers would use them in their classrooms. Technology needs to be combined with properly trained teachers before it can be really beneficial for students. (p. 165)

The authors also point out that although preservice teacher education usually covers topics such as instructional strategies and classroom management, such topics are generally addressed in contexts that do not involve

technology use. However, if the use of technology does change the dynamics of the classroom, then preservice teachers need exposure to and experience in technology-enriched classrooms if they are to teach successfully in that environment.

The Waxman and Huang study meets many of the criteria for a good scientific study, but, like most applied studies conducted in a real-world environment, it does not meet all of them. For example, the researchers used intact groups that were conveniently available rather than randomly assigning each of the 2,000 students who participated to an experimental group. Another education study (Brush, 1997) did randomly create control and experimental groups specifically for the research study. Brush was concerned with the way integrated learning systems (ILSs) are commonly used in schools. (ILSs typically diagnose students' academic deficits and then focus on teaching students what they do not know through drills, tutorials, and practice.) Typically, students work alone at their ILS computers. Brush cited literature indicating that this isolated approach to ILS work can lead to increased anxiety, hostility, and boredom. His study "examined achievement and behavior differences between students completing ILS activities in a traditional, individualized format, and students completing the same activities in cooperative learning groups" (p. 51). He randomly assigned 65 fifth graders to one of two groups, cooperative or individual, and after several weeks of work in the math section of the Jostens ILS, he administered an achievement posttest and an attitude scale. The attitude questionnaire had questions such as "Do you like math?" and "Do the computer math lessons help you with your math classwork?" Students in the cooperative group scored significantly higher on the achievement test and had significantly better attitudes toward both math and the computer math lessons.

These two studies point out some of the problems of dividing up research by paradigms. Postpositivist research often is associated with teaching strategies based on behavioral and information processing theories. However, Waxman and Huang's study used objective methods to demonstrate that classrooms with higher levels of technology use tend to be more "constructivist." Thus "technology can be the catalyst that helps teachers shift from traditional lecture and drill approaches to more student-centered, authentic approaches that emphasize teaching for understanding" (Waxman & Huang, 1996, p. 166). This study thus uses objectivist methods to demonstrate that technology may well support a move toward more subjective teaching and learning environments. Brush's study, on the other hand, attempts to compare a very structured, objective approach to teaching and learning (e.g., ILSs) with a constructivist strategy, cooperative learning. However, in Brush's study the definition of cooperative learning is that pairs of students worked at the computer on the ILS assignments. They helped each other with the ILS

lessons. This is a bit like saying you are using cooperative learning strategies if you allow students to work in pairs while they complete the math drill sheets you duplicate and hand out for seatwork. Constructivist educators would argue that cooperative learning involves more than children working together; it involves them working on quite different types of activities than are typical of the tasks found in integrated learning systems. The Brush study illustrates one significant problem of crossing paradigms: The meaning of critical terms and phrases may be subject to debate.

### **Social Science Research: The View From the Critical Theory Paradigm**

In their chapter on critical theory Nichols and Allen-Brown (1997) comment that “the language of critical theory is at times difficult to understand” (p. 227). Similarly, Smith (1993) begins his explanation of critical theory with the comment that “of the three major philosophical tendencies now competing for the attention of social and educational researchers, critical theory is probably the most difficult to understand and, as a result, the most difficult to coherently summarize” (p. 91). This section attempts to capture some of the essence of this paradigm, although most critical theorists will find this effort less than satisfactory.

Proponents of critical theory are a loose collection of scholars and practitioners who tend to focus on the impact of power relationships in human cultures. Critical theory emerged from Marxism in the first half of the 20th century and differs from classical Marxism in its willingness to explore a wide range of power relationships, including those involving gender, race, and ethnicity, whereas classical Marxism tended to focus on capitalist-worker relationships and control of the means of production. Leading proponents of critical theory as a philosophy include Jürgen Habermas. He is a contemporary advocate of a tradition that goes back to a movement called the Frankfurt School, which included both social scientists and philosophers associated with the Institute for Social Research that began in Frankfurt, Germany, in 1929. Examples of scholarship in this tradition include Apple (2003), Giroux (2001a, 2001b) Sloan (2001), and Nightingale and Cromby (1999). Members of this group are generally known today as *critical theorists*. The terminology and the framework of critical theory research are unfamiliar to many people. Consider this explanation by a critical theorist:

Critical research assumes the necessity of critique of the current ideology, seeking to expose dominating or oppressive relationships in society. It illuminates power relationships between individuals and groups of

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individuals, enabling the researcher and participants to critique commonly-held values and assumptions. It requires the researcher and participants to be willing to become aware of how a false understanding contributes to oppression and resistance.

Critical theory is also concerned with human action and interaction. When action takes place, the historical context changes and we must critique our assumptions again. Critical theory is a continuous process. Its goal is Utopia and its reality is that although Utopia may not be possible, our struggle to achieve it will at least create something better than our current existence. (Kilgore, 1998)

In simpler terms, critical theory research tends to emphasize relationships that involve inequities and power, and a desirable aspect of critical research involves helping those without power to acquire it.

Kilgore (1998) explains research in the critical theory tradition this way:

Critical research begins with identifying a specific organization of people whose needs are not satisfied within the current system, and who are willing and able to put research findings into practice. Researchers then enter the participants' world to gain an interpretive understanding of their intersubjective meanings; the culture that has been created by all groups of actors in their world. Researchers then figure out how the current social condition came to exist with historical and empirical analyses.

Understanding the current social condition and the events and actions leading up to the present, the researcher then tries to illustrate the "dialectical tension between historically created conditions of action and the actors' understanding of these conditions" (Comstock, 1982, p. 383). This model reveals social contradictions under which human beings work for a society that no longer works for them. The researcher tries to educate participants and enable them to see the situation in a different light and themselves as capable of transforming a culture that they participated in creating. Finally, the researcher participates in a program of action that will change the current social condition.

Many of the research methods you will study later in this book are used by critical theorists. In fact, some are almost unique to them.

Although the rhetoric of critical theorists is quite different from that of both postpositivists and interpretivists, they are also defined, to a great extent, by the positions they take on the five foundational issues discussed earlier.



### *Nature of Reality*

Table 3.2 suggests that critical theory shares only one common foundation with postpositivism: a belief in an external, knowable reality. There is actually even less agreement than is implied by the table. Yes, both are materialists and thus agree that there is an external reality, but the form that reality takes is quite different in the two paradigms. Critical theory's external reality has little in common with the external reality of postpositivism, and this is only the beginning of the differences between these two paradigms. For example, postpositivist researchers might study the impact of a new method of teaching certain business skills to students. Critical theorists might analyze the impact of the skills themselves and conclude that education is being used as a tool of business to subjugate workers and prepare them to fit into boring jobs created by industry. Although critical theorists might not argue with the findings of the postpositivist who is studying better ways to teach certain skills, they would probably question whether those skills are really important and whether teaching them is a good or bad idea. They might also assert that such research supports a system that is itself in need of reform or revolution. Thus, the reality of the postpositivist is quite different from the reality of the critical theorist.

**Table 3.2** Differences Between Postpositivism and Critical Theory on the Five Major Issues

	<i>Postpositivism</i>	<i>Critical Theory</i>
Nature of reality	Material and external to the human mind	Material and external to the human mind
Purpose of research	Find universals	Uncover local instances of universal power relationships and empower the oppressed
Acceptable methods and data	<ul style="list-style-type: none"> <li>• Scientific method</li> <li>• Objective data</li> </ul>	Subjective inquiry based on ideology and values; both quantitative and qualitative data are acceptable
Meaning of data	<ul style="list-style-type: none"> <li>• Falsification</li> <li>• Use to test theory</li> </ul>	Interpreted through ideology; used to enlighten and emancipate
Relationship of research to practice	<ul style="list-style-type: none"> <li>• Separate activities</li> <li>• Research guides practice</li> </ul>	<ul style="list-style-type: none"> <li>• Integrated activities</li> <li>• Research guides practice</li> </ul>

### Article of Interest

**Steve Fleetwood. (2005, March). *Ontology in organization and management studies: A critical realist perspective. *Organization*, 12, 197–222.***

The State Museum of Russian Art in Kiev, Ukraine, houses an interesting painting. The name of the picture is *Easter Procession in a Village*, and it shows the poor peasants of the village marching down the street in an Easter procession while the drunken village priest stands unsteadily on the steps of a house (you can view the picture at <http://www.abcgallery.com/P/perov/perov23.html>). At his feet is another religious official, who is so drunk he has fallen down. The two are moving from one house to another, blessing the inhabitants and receiving the customary and expected gifts of food and drink. The painter, Vasily Perov, was part of the critical realist movement in art. This group used art to point out the poverty and oppression of the poor by those in power. Perov painted his village procession scene in 1861. He was one of the leaders in the critical realist movement that attempted to influence the power structure of tsarist Russia to reform the system and improve the lot of the peasants.

Although the term *critical realism* has a number of different meanings today, there are still elements of the meaning that led Vasily Perov to try to use his artistic talent to help emancipate and empower the peasants of Russia. In this article Steve Fleetwood, from Lancaster University in the United Kingdom, takes a critical realist view of the world and applies it to business research.

Fleetwood does not find positivist realist positions on the nature of the world very appealing. However, he is also not very happy with the fuzzy, subjective nature of an interpretivist's or postmodernist's world. He rejects a subjective foundation for research and proposes instead a realist foundation. However, his is a critical realism rather than a postpositivist realism. As you read the article, note that he rejects aspects of both subjective and positivist versions of what we can know. For example, he argues that the world is knowable as something separate from the mind of the knower. However, he does not believe there is any possibility of humans having unmediated access to the external world (external to the human mind). All our access is mediated by our prior experiences and beliefs. Thus, Fleetwood neither totally rejects nor totally accepts either positivism or interpretivism (postmodernism). However, his strongest criticisms are aimed at postmodern or interpretive subjectivism. Do you find his version of critical realism an appealing alternative to positivist realism and interpretive subjectivism? Why?

To read the entire article, please go to [http://www.sagepub.com/willis\\_aoi](http://www.sagepub.com/willis_aoi).

### *Purpose of Research*

Critical theory is less focused on methodology than it is on the reason for doing research. In fact, as noted in chapter 2, Guba (1990) thinks the phrase *ideologically oriented inquiry* is a much better name for this approach than

*critical theory* because it emphasizes the focus on ideology as a guide to research. Critical theorists do accept that there is an external reality, but as noted in Table 3.2 they do not pretend to be objective about how they go about discovering that external reality. They *know* that power relationships are critical factors in society, and they know the research they conduct will find specific examples of the negative influence of those relationships. Much of the research within this paradigm is aimed at uncovering these hidden relationships and making us aware both that they exist and that they disenfranchise some groups while giving excessive power and resources to others.

Although critical theorists tend to conduct research that makes us aware of issues such as gender bias in corporate hiring, many critical theorists argue that it is not enough simply to point out problems. The research must also empower the oppressed and help them overturn or overcome the oppression. As Smith (1993) puts it, “The regulative ideal of critical social and educational inquiry is to integrate theory and practice in a way that not only makes transparent to people the contradictions and distortions of their social and educational lives, but also inspires them to empower and emancipate themselves. Critical theorists and critical inquirers have embraced the Marxian injunction that the idea is not merely to interpret or understand the world, it is to change it” (p. 92). Research and practice are thus integrated activities in the critical paradigm. Paulo Freire (1995; Freire & Barr, 1995) probably is the best-known theorist in education who advocated this more active form of critical theory.

Critical theory’s idealized version of what research should be is based on the concept that the research process is interwoven with practice in such a way that it helps those who are oppressed to free themselves from the oppression. However, thus far the critical theorists have demonstrated much more skill at criticizing than at empowering and freeing. Most research projects within this tradition are cogent critiques of the current state of affairs. A minority of the critical studies detail successful efforts to bring about change.

### Article of Interest

**Gaile S. Cannella & Yvonna S. Lincoln. (2004, April). Epilogue: Claiming a critical public social science—Reconceptualizing and redeploying research. *Qualitative Inquiry*, 10, 298–309.**

Cannella and Lincoln have written an aggressive defense of the critical research agenda in the social sciences that puts the issue squarely in the political and ideological arenas. They make their critical theory foundation clear by declaring, “First, research as construct was/is conceived and practiced as a political act that

generates power for particular groups" (p. 302). Critical research is to support a left-wing view of both the way things are and the way things should and can be (e.g., "engaging in a struggle for liberatory social transformation," p. 304). The authors define the type of research that needs to be done and argue that social scientists must make a concerted effort to get the message of critical social science research to the public and to counter the right-wing research agenda, supported mostly by the positivist and postpositivist paradigm. Would the field of social science that interests you be better if it adapted a critical realist paradigm? A postpositivist paradigm? Why?

To read the entire article, please go to [http://www.sagepub.com/willis\\_aoi](http://www.sagepub.com/willis_aoi).

### *Acceptable Methods and Data*

Because the heart of critical theory is ideological rather than methodological, the research from this paradigm is not limited to a narrow range of methods. Critical theorists sometimes criticize the "objective" methods of postpositivism because the approach tends to treat people and social phenomena as things or objects. Critical theorists also argue that the whole process of research—from the selection of research topics to the creation of research instruments and the interpretation of the data gathered—is not a value-free activity. Each step of the research process is based on the values and beliefs of the researcher. Therefore, there can be no "objective" research. However, there are examples of both quantitative and qualitative research in this tradition.

### *Meaning of Data*

The difference between critical theory research and other paradigms, especially interpretivism, is not so much in the methods used as in the way the data are interpreted and understood. Both critical theory and interpretivism often use qualitative research methods but in different ways. Carspecken's (1995) book on qualitative research methods is a clear-cut explanation of how several qualitative methods are used within the critical paradigm. Carspecken does not introduce readers to ethnography; he presents the case for *critical* ethnography. The difference between critical use of a method and an interpretive or postpositivist use is important but difficult to explain. If they used a qualitative method, postpositivists would conduct research to get at "the way things are," but critical theorists do not view the data as having significant meaning in themselves. The interpretation of data from a critical perspective entails thoughtful analysis and reflection.

The purpose of that analysis and reflection is “to critique or make transparent the false consciousness and ideological distortion” (Smith, 1993, p. 106). Critical theorists believe current social and political systems distort reality and create in individuals a false consciousness that keeps them from seeing the real structure of society. It is only through critical self-reflection that we can free ourselves of these distortions and move toward a truly emancipated society. Research in the critical tradition is thus part of the process of fostering and nurturing self-reflection, which is a necessary step in the course of moving society toward the empowerment of all citizens. For more information on critical methodology, see Gitlin (1994), Morrow and Brown (1994), and Lather (1991).

### *Relationship of Research to Practice*

There are several aspects of the critical theorist’s view of research and practice. Unlike postpositivists, critical theorists tend to emphasize scholarship that occurs in context. If they study gender bias, for example, they are likely to do it in a setting such as a classroom, a factory, a university, or an organization. Postpositivists are more likely to study it in artificial, more controlled environments. For example, postpositivists might study gender bias in a psychology lab at a university (rather than studying the patterns of gender bias in the promotion and hiring practices of the psychology department).

Critical theory’s emphasis on meaningful research in context is supported by the emphasis on going beyond knowing something. To be useful the research also has to be emancipatory. Emancipatory research helps free individuals and groups from oppression and control. Thus, critical theorists tend to see research and practice as interwoven rather than separate activities.

However, research conducted by a critical theorist generates knowledge that is superior to the knowledge of people the researcher studies. One purpose of research is to free those studied from their mistaken beliefs so they can achieve goals generally set by the researcher. Therefore, although critical research and critical practice commingle, there is an inherent assumption that the knowledge developed by the research is superior to that of subjects in the research. A goal is thus to get the subjects to believe as the researcher does.

### **Examples of Critical Research**

Michael Apple (1991, 1995, 2003; Bromley & Apple, 1998; Carlson & Apple, 1999) is one of the best-known critical theorists in education. He also writes regularly about issues related to technology in education. In 1990 he

made a presentation to the annual meeting of the Society for Technology and Teacher Education. His paper was subsequently published (Apple, 1991) and is a good example of the type of conceptual work many critical theorists do. Apple did not describe in his article a single “study,” nor did he summarize the results of a series of individual studies. Instead, he stepped back and took a broad view of the field. He argued that too many of the discussions about technology in education focus on the “how to” questions rather than the “why” questions. He then explored a number of political and economic issues and discussed in detail whether teaching as a profession will be enhanced and empowered by the advent of technology. His conclusion was that if current trends continue the profession may well be disempowered and deskilled as teaching is redefined as a management job that focuses on keeping the computers running while the machines deliver specific, skill-based instruction to students who are being prepared for boring, demeaning jobs in a capitalist society that views people as resources to be used as the employer sees fit.

Apple’s broad-stroke research draws from the methods of the historian and essayist as well as of the critical educational researcher. This is a common approach among critical theorists because they are often concerned with larger and more complex issues. C. A. Bowers (1988) uses a similar approach in his article “Teaching a Nineteenth-Century Mode of Thinking Through a Twentieth-Century Machine.” In the article he argues that the way personal computers are being used in education reinforces certain types of social interaction and legitimizes certain types of knowledge at the expense of others. Bowers argues that in a computer-intensive learning environment the role of the teacher as an interpreter, clarifier, and amplifier of cultural knowledge becomes critical because of the bias built into the computer as an educational tool.

Critical theorists also use more traditional qualitative and quantitative research methods. For example, Monke (1999) used a detailed case study of the diffusion of technology into the public schools of Des Moines, Iowa, to highlight the significant and serious hidden costs to teachers and administrators of such efforts. A modified case study method was also used by Ann De Vaney (1993) to analyze the gender issues inherent in a popular piece of educational software, *The Oregon Trail*.

Critical theorists have also used several types of quantitative methods. For example, Chappell (1996) used a procedure called content analysis to study gender representation and the amount of violence and competition in the most popular math educational software. Her results indicated that 4.2% of the activities in preschool math software were violent, and 46% of the activities in high school programs were violent. Similarly, none of the

activities in the preschool software involved competition against peers, whereas 31% of the activities at the high school level were competitive. Chappell points out that some research suggests that the attitude of girls toward computers is positive in preschool but becomes more negative over the years. She suggests that the amount of violence and competition in software may be one factor in that trend. Her study also found that whereas 39% of the characters in preschool math software were female, only 13% were in high school programs.

Another critical theorist, Jonathan Rees (2003), analyzed the use of standardized testing in American schools, with a focus on American history. He analyzed the American history section of the National Assessment of Educational Progress. Rees offers a thoughtful and careful critique of the test itself and many of the ways the results are used. However, his approach is informed and guided by a critical theory of education. Consider these comments from his article:

- The test's "structural flaws and problems with question design make any standardized history test a bad measure of student understanding. Worse still, because the framework of this exam limits test subject areas to a narrow consensus, it defeats the purpose of learning historical knowledge to promote informed democracy and encourages the misuse of history for partisan political purposes."
- The questions "tend to stress the importance of institutions over individuals, conservative actors over reformers and agreement over dissent. In other words, they tend to reflect conservative political values."
- "By defining . . . American history . . . in the most uplifting terms, conservatives, including President Bush, can then use history to promote their political agenda. Under the cover of promoting citizenship, they want to limit American history to information that reinforces their point of view."
- "Rather than recognize the inherent flaws . . . conservative politicians and educational reformers exploit standardized test scores to promote the idea that a crisis exists in history and civics education. They insist that the house is on fire so that they can sell their version of fire prevention. Teaching conservative values is how they want to stop historical and civic ignorance from reoccurring, and by using standardized tests they can claim their methods are scientifically measured and objective. . . . The crisis over the failure of American students to learn the component knowledge of an unattainable consensus is nothing but a political smokescreen."

- The National Assessment of Educational Progress “reflects the conservative consensus championed by the test’s political backers. And because these views are cloaked under the auspices of a supposedly objective test, parents, students and other segments of the American public don’t realize how their understanding of history is being manipulated.”

In an analysis of the “correct” answers to questions, Rees used the question, “What is the purpose of labor unions?” as an example. The answer counted as correct (“to protect jobs and interests of workers”) reflects the “consensus desire for upward mobility” but “wobblies, communists and socialists [who supported labor unions for other reasons] are therefore not worth noticing.”

Rees’s research is a very good example of how ideology guides research in the critical paradigm. Of course, Rees and other critical theorists would argue that ideology also guides research in other paradigms, but that fact is often hidden (something he accuses conservative educators of doing).

One final comment on critical theory research: Critics, including other critical theorists, often chastise this paradigm because it often seems “to be aimed at building individual careers by criticizing the work of others, and it emphasizes the ways in which people are oppressed and despairing” (Nichols & Allen-Brown, 1997, p. 229). The critical theory literature can indeed be a downer, with too much doom and gloom and far too few examples of positive work done from a critical perspective. However, that is changing. More and more critical theorists are taking initiative and developing approaches to problems in our field that reflect the values and perspectives of critical theory.

#### Article of Interest

**Susan Birden. (2004, August). Theorizing a coalition-engendered education: The case of the Boston Women’s Health Book Collective’s body education. *Adult Education Quarterly*, 54(4), 257–272.**

Despite our implication that critical theorists don’t do much more than criticize, this article by a professor at Buffalo State College illustrates just the opposite: a critical approach that is emancipatory and change focused. The main emphasis is on the use of an approach called coalition-engendered education, which the author illustrates by discussing the origins and operation of the Boston Women’s Health Book Collective. The author, Susan Birden, contrasts this approach with



a more established approach to emancipatory research based on literacy that was developed by Paulo Freire. After reading the article, do you see the approach advocated by Birden as an extension of Freire's work or a different approach to emancipation? Why? Do you agree with Birden's criticism of mainstream adult education as being too much like schooling? Why? Finally, would you consider work to establish and grow a coalition-engendered education group to be community activism, research, or both? Why?

To read the entire article, please go to [http://www.sagepub.com/willis\\_aoi](http://www.sagepub.com/willis_aoi).

## Summary

These two research traditions, postpositivism and critical theory, are quite different. Postpositivist research is separate from practice. It is conducted in an *objective* way using objective methods. Critical theory research often is subjective, conducted with emotion and ideological bias in the "real world." (Note, however, that critical theorists would argue that postpositivist research is not objective but rather is controlled and directed by the values and beliefs of the researchers and their supporters.) These two forms of research have different purposes, different methods, and different ways of looking at the data of the research project. Critical theorists often criticize postpositivists for studying unimportant things simply because they can be quantified and for studying things that prop up and maintain systems that should be torn down. Postpositivists often criticize critical theorists for confusing ideological practice with "real" research and for coming to the research table with preconceived biases about what will be learned.

In the next chapter you will learn about another framework: interpretivism. It has some things in common with the postpositivist paradigm but shares more with the critical theory paradigm. Interpretivism is also roundly criticized by proponents of both the competing paradigms.

## Questions for Reflection

1. A scholar's view of the nature of reality has a major impact on the research she or he does. Select a topic of research that interests you and link views on the nature of reality to aspects of the research endeavor: purpose, acceptable methods, data analysis, and the research–practice link.

2. Consider the five areas of difference discussed in this chapter. Develop your own position on each of them. Does your personal perspective fit one of the established philosophies of science? Do you differ on any of the foundational issues with the paradigm you are closest to? Why?
3. Consider the relationship between research and practice. What is the typical pattern in your field of practice or interest? Is the typical pattern a good one? Or would a different pattern be more useful? Why?
4. Create three imaginary studies of a particular topic that typify research in each of the three paradigms. Include information on the purpose of the study, the design and data analysis, and the relationship of the researcher to practitioners.

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