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MIXED METHODOLOGY

Combining Qualitative and Quantitative Approaches

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Pragmatism and the
Choice of Research Strategy

In Chapter 1, we presented an overview of "mixed model studies" as an effort to combine the quantitative and qualitative approaches. We discuss these "mixed model studies" in Chapter 3. In the current chapter, we discuss a variety of conceptual and methodological issues pertaining to monomethod research.

The specific purposes of this chapter are to (a) discuss the relative importance of the research question, method, and paradigm; (b) present further distinctions among positivism, postpositivism, constructivism, and pragmatism; (c) present arguments for why pragmatism is the appropriate paradigm for justifying the use of mixed method and mixed model studies in the behavioral and social sciences; (c) present the basic issues and principles involved in traditional (monomethod) research procedures and provide more detail about the evolution of the taxonomy of methodological approaches presented in Table 1.1; and (d) provide more information about the differences and similarities among these methodological approaches.

If you are already familiar with distinctions among the paradigms, or you are not interested in paradigmatic discussions, there is no need to read the first two sections of the chapter. Please proceed to the last two sections of the chapter that concern design issues in monomethod research and a taxonomy of traditional data collection techniques.

THE DICTATORSHIP OF THE RESEARCH QUESTION
(NOT THE PARADIGM OR METHOD)

For researchers, an important philosophical issue concerns the relative importance of paradigms, research methods, and research questions. In their most recent writing, Guba and Lincoln (1994) have reiterated that, from their point of view, research methods are of secondary importance to research paradigms:

Both qualitative and quantitative methods may be used appropriately with any research paradigm. Questions of method are secondary to questions of paradigm, which we define as the basic belief system or worldview that guides the investigation, not only in choices of method but in ontologically and epistemologically fundamental ways. (p. 105)

Despite this statement, Guba and Lincoln continue to link specific paradigms with specific methods; for instance, they (1994) linked postpositivism with the following methodologies: "modified experimental/manipulative; critical multiplism; falsification of hypotheses; may include qualitative methods." On the other hand, they linked constructivism with a methodology that they called the "hermeneutical/dialectical" (p. 109).[1]

Howe (1988) states the pragmatist response to the importance of paradigm (and of the paradigm-methodology link) as follows:

Compatibilists... want to overcome the forced choice between... the conceptual over the empirical— is the hallmark of pragmatic philosophy. (p. 13)

But why should paradigms determine the kind of work one may do with inquiry any more than the amount of illumination should determine where one may conduct a search? . . . Eschewing this kind of "tyranny of method" (Bernstein, 1983)—of the epistemological over the practical, of the conceptual over the empirical— is the hallmark of pragmatic philosophy. (p. 13)

Howe's (1988) comments follow up on the following admonition by Trow (1957): "Let us be done with the arguments of 'participant observation' versus interviewing . . . and get on with the business of attacking our problems with the widest array of conceptual and methodological tools that we possess and they demand" (p. 35).

Similarly, Brewer and Hunter (1989) stated that the multimethod approach allows investigators to "attack a research problem with an arsenal of methods that have nonoverlapping weaknesses in addition to their complementary strengths" (p. 17).

To put all of this more simply and directly, we believe that pragmatists consider the research question to be more important than either the method they use or the worldview that is supposed to underlie the method. Most good researchers prefer addressing their research questions with any methodological tool available, using the pragmatist credo of "what works" (e.g., Cherryholmes, 1992; Howe, 1988; Rorty, 1982). For most researchers committed to the thorough study of a research problem, method is secondary to the research question itself, and the underlying worldview hardly enters the picture, except in the most abstract sense. While the majority of this text thus far has concerned the paradigm wars and their resolution, it

is important to reiterate that such paradigmatic considerations are not as important in the final analysis as the research questions that you are attempting to answer. (For a detailed presentation of types of research questions, see Hedrick, Bickman, & Rog, 1993, pp. 23-34.)

Our best scholars have always been more interested in investigating the questions that they have posed than the specific methodologies that they employ and the paradigms that underlie these methods. For instance, shortly after the recent death of pioneering methodologist Donald T. Campbell, Gene V. Glass eulogized him in a message sent out over the World Wide Web: "The method must follow the question. Campbell, many decades ago, promoted the concept of triangulation—that every method has its limitations, and multiple methods are usually needed."

COMPARISONS AMONG THE PARADIGMS

Table 2.1 contains a presentation of what we consider to be the primary distinctions among four major paradigms used in the social and behavioral sciences: positivism, postpositivism, pragmatism, and constructivism. The comparisons with regard to positivism, postpositivism, and constructivism were abstracted from Denzin and Lincoln (1994), Lincoln and Guba (1985), Guba and Lincoln (1990, 1994), House (1994), Greene (1994), and Miles and Huberman (1994). The information with regard to pragmatism was abstracted from Cherryholmes (1992), Greene (1994), House (1994), Howe (1988), Murphy (1990), and Rorty (1982). (Critical theory and its variants were not included in this comparison because they emphasize historical methods, while the focus in this text is on examination of ongoing phenomena.)

It is interesting to note that theorists delineating between positivism (including postpositivism) and constructivism (or interpretivism) typically do not include pragmatism as a third point of comparison (e.g., Guba & Lincoln, 1994; Smith & Heshusius, 1986), even though those two competing points of view do not exhaust the paradigmatic possibilities. As Howe (1988) notes, "This seems to be a serious omission, for pragmatists were largely responsible for bringing down positivism and would clearly reject the forced choice between the interpretivist and positivist paradigms" (p. 13).

Rejection of the Either-Or

In Table 2.1, the pragmatist point of view is illustrated as rejecting the forced choice between positivism (including postpositivism) and construc-

Table 2.1
Comparisons of Four Important Paradigms
Used in the Social and Behavioral Sciences

Paradigm	Positivism	Postpositivism	Pragmatism	Constructivism
Methods	Quantitative	Primarily Quantitative	Quantitative + Qualitative	Qualitative
Logic	Deductive	Primarily Deductive	Deductive + Inductive	Inductive
Epistemology	Objective point of view. Knower and known are dualism.	Modified dualism. Findings probably objectively "true."	Both objective and subjective points of view.	Subjective point of view. Knower and known are inseparable.
Axiology	Inquiry is value-free.	Inquiry involves values, but they may be controlled.	Values play a large role in interpreting results. Choose explanations that best produce desired outcomes.	Inquiry is value-bound.
Ontology	Naive realism	Critical or transcendental realism.	Accept external reality.	Relativism
Causal linkages	Real causes temporally precedent to or simultaneous with effects.	There are some lawful, reasonably stable relationships among social phenomena. These may be known imperfectly. Causes are identifiable in a probabilistic sense that changes over time.	There may be some causal relationships, but we will never be able to pin them down.	All entities simultaneously shaping each other. It's impossible to distinguish causes from effects.

tivism with regard to methods, logic, and epistemology. In each case, pragmatism rejects the either-or of the incompatibility thesis and embraces both points of view. Nielsen (1991) suggests that pragmatism is a "reactive, debunking philosophy" (p. 164) that argues against dominant systematic philosophies, making mocking critiques of metaphysical assertions such as "the grand Either-Or."

With regard to methods, we discuss the pragmatist orientation toward using both qualitative and quantitative methods throughout this volume. While information in Table 2.1 indicates that postpositivists may also use qualitative methods, the discussion of methodological correctness in Chapter 1 should be reiterated. When choices are between qualitative or quantitative methodology, postpositivists typically prefer the experimental design

(or variants thereof such as *quasi-experimental designs* and *ex post facto or causal comparative designs*) due to their concern with causality and internal validity (e.g., Cook & Campbell, 1979).

Similarly, constructivists prefer their own methods and dutifully distinguish the differences in methodological orientations. For example, Denzin and Lincoln (1994), writing in the *Handbook of Qualitative Research*, presented the following typologies of what they consider to be nonoverlapping methodologies:

The five points of difference described above . . . reflect commitments to different styles of research, different epistemologies, and different forms of representation. Each work tradition is governed by a different set of genres. . . . Qualitative researchers use ethnographic prose, historical narratives, first-person accounts, still photographs, life histories, fictionalized facts, and biographical and autobiographical materials, among others. Quantitative researchers use mathematical models, statistical tables, and graphs. (p. 6)

Pragmatists, on the other hand, believe that either method is useful, choosing to use the dazzling array of both qualitative and quantitative methods listed by Denzin and Lincoln. Decisions regarding the use of either qualitative or quantitative methods (or both) depend upon the research question as it is currently posed and the phase of the research cycle that is ongoing.

The Research Cycle: Using Both Inductive and Deductive Logic

Research on any given question at any point in time falls somewhere within a cycle of inference processes, often referred to as the research cycle, the chain of reasoning (e.g., Krathwohl, 1993), or the cycle of scientific methodology. The cycle may be seen as moving from grounded results (facts, observations) through *inductive logic* to general inferences (abstract generalizations, or theory), then from those general inferences (or theory) through *deductive logic* to tentative hypotheses or predictions of particular events/outcomes. See Figure 2.1 for a visual representation of this chain of reasoning.

Research concerning any substantive area of inquiry travels through this cycle at least once before it ends. Research may start at any point in the cycle: Some researchers start from theories or abstract generalizations, while others start from observations. In many research reports, there is an initial attempt to inductively build a conceptual (theoretical) framework on
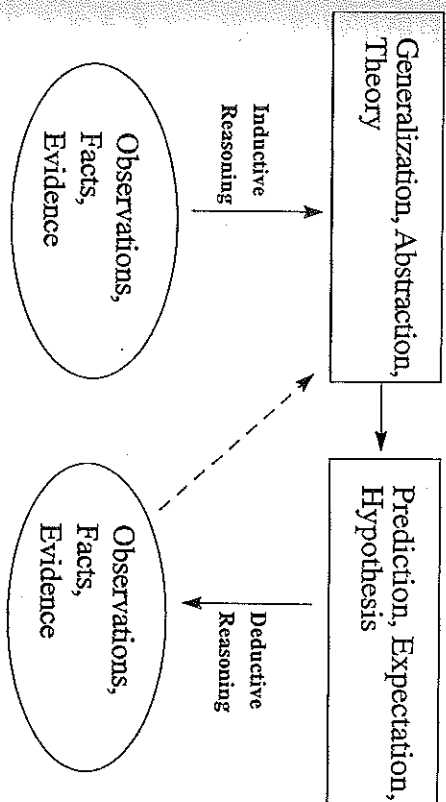
Figure 2.1. The Research Cycle (Cycle of Scientific Methodology)

the basis of previous findings (i.e., in the introduction section of a journal article). The obtained theoretical framework is then used as a basis for planning the course of the research. Regardless of where the researcher starts (facts or theories), a research project always starts because there is a question that needs a satisfactory answer, and partially travels through the cycle at least once.

At some points during the research process, it is likely that both types of inferences and methods will be used simultaneously. When this occurs, then we have the *mixed model studies with multiple applications within phase of study* depicted in Table 1.1 in Chapter 1. Pragmatists accept that they will have a choice of inductive and deductive logic in the course of conducting research on a question that needs to be answered.

Epistemological Relativism: The Use of Both the Subjective and the Objective Points of View

Again, the black and white contrast of the incompatibility thesis (either a dualism or a singularity, either an objective or a subjective point of view) is challenged by the pragmatists' contention that scientific inquiry is not "formalistic" and that researchers may be both objective and subjective in epistemological orientation over the course of studying a research question. In this case, it is more reasonable to think of a continuum than two opposing poles: At some points, one may be more "subjective," while at others more

"objective"; at some points the knower and the known must be interactive, while at others, one may more easily stand apart from what one is studying.

If one allows the researcher to use both qualitative and quantitative methodological tools, then this embrace of both the subjective and the objective points of view is inevitable.

The Roles of Values (Axiology)

As indicated in Table 2.1, positivists believe that inquiry is value-free, while constructivists believe that inquiry is value-bound. Postpositivists realize that values play an important role in inquiry, but they also believe that it is possible to control the degree to which values influence results and interpretations.

As noted in Chapter 1, postpositivists acknowledge both the value-ladenness and the theory-ladenness of facts (Reichardt & Rallis, 1994). Despite this recognition (and to a large degree *because of it*), postpositivists (e.g., Cook & Campbell, 1979) have devoted considerable effort to developing methods whereby the internal and external validity of their conclusions can be enhanced. These methods, aimed at enhancing the validity of results and their interpretations, represent the postpositivists' attempt to reduce the influence of their personal values and their allegiances to certain theoretical positions.

Pragmatists believe that values play a large role in conducting research and in drawing conclusions from their studies, and they see no reason to be particularly concerned about that influence. As Cherryholmes (1992) stated,

For pragmatists, values and visions of human action and interaction precede a search for descriptions, theories, explanations, and narratives. Pragmatic research is driven by anticipated consequences. Pragmatic choices about what to research and how to go about it are conditioned by where we want to go in the broadest of senses. . . . Beginning with what he or she thinks is known and looking to the consequences he or she desires, our pragmatist would pick and choose how and what to research and what to do. (pp. 13-14)

Thus pragmatists decide what they want to research, guided by their personal value systems; that is, they study what they think is important to study. They then study the topic in a way that is congruent with their value system, including variables and units of analysis that they feel are the most appropriate for finding an answer to their research question. They also

conduct their studies in anticipation of results that are congruent with their value system. This explanation of the way in which researchers conduct their research seems to describe the way that researchers in the social and behavioral sciences actually conduct their studies, especially research that has important social consequences.

Considerations of Ontology and Causality

The most controversial issues related to the positivist/postpositivist, constructivist, and pragmatist points of views concern ontology and causality (the last two rows in Table 2.1). Guba and Lincoln (1994) considered differences concerning the nature of reality (ontology) to constitute the defining distinction between positivism/postpositivism and constructivism: "The term *constructivism* denotes an alternative paradigm whose breakaway assumption is the move from ontological realism to ontological relativism" (p. 109, italics in original). Guba and Lincoln (1994) and Miles and Huberman (1994) defined the following types of realism:

(1) Naive realism. There is an objective, external reality upon which inquiry can agree (Guba & Lincoln, 1994, p. 111). As indicated in Table 2.1, this position is associated with positivists.

(2) Critical realism. There is an objective reality, but it can be understood only imperfectly and probabilistically (Guba & Lincoln, 1994, p. 111). This position is associated with postpositivists.

(3) Transcendental realism. This involves the belief that social phenomena exist in the objective world, and that there are some "lawful and reasonably stable relationships" among them (Miles & Huberman, 1994, p. 429). This statement is an alternative expression of the postpositivist position.

(4) Ontological relativism. There are multiple social realities that are products of human intellects and that may change as their constructors change (Lincoln & Guba, 1994, p. 111). This position is associated with constructivists.

The major difference between the positivists/postpositivists and the constructivists on the nature of reality concerns the existence of an objective, external reality: The positivists/postpositivists believe that such an objective reality exists (please see Greenberg & Folger, 1988, chap. 1, for

a discussion of controversies in this respect); the constructivists believe that only multiple, subjective realities exist.

The pragmatist point of view regarding reality consists of two parts:

1. There is an external world independent of our minds (Cherryholmes, 1992, p. 14). Thus the pragmatists agree with the positivists/postpositivists on the existence of this external reality.

2. On the other hand, pragmatists deny that "Truth" can be determined once and for all. They also are unsure if one explanation of reality is better than another. According to Cherryholmes (1992), the pragmatists' choice of one explanation over another "simply means that one approach is better than another at producing anticipated or desired outcomes" (p. 15).

Howe (1988) further explained the pragmatists' views regarding truth as follows:

For pragmatists, "truth" is a normative concept, like "good," and "truth is what works" is best seen not as a theory or definition, but as the pragmatists' attempt to say something interesting about the nature of truth and to suggest, in particular, that knowledge claims cannot be totally abstracted from contingent beliefs, interests, and projects. (pp. 14-15)

Notions regarding causal relationships follow from these ontological distinctions. In short:

1. Postpositivists believe that there are some lawful, reasonably stable relationships among social phenomena that may be known imperfectly, or in probabilistic terms. Although the prediction of some event (criterion variables, "effects") from others (predictor variables, "causes", and so on) is never possible with 100% accuracy (probability of 1.00), the accuracy of predictions can be improved over time and as potent predictors are identified.

2. Pragmatists believe that there may be causal relationships but that we will never be able to completely pin them down.

3. Constructivists believe that all entities are simultaneously shaping each other and that it's impossible to distinguish causes from effects.

Thus there is an increase in pessimism regarding the possibility of understanding causal relationships as one goes from the postpositivists to the pragmatists to the constructivists. For example, House (1994), in a

response to Cherryholmes' (1992) presentation of pragmatism, expressed the scientific realist (postpositivist) point of view as follows:

Criteria for judging explanations vary from discipline to discipline and within disciplines from time to time, but with some contact with material reality. When scholars invent new ideas, using new stories and metaphors perhaps, they create new explanations of the physical world, but do not invent the world, which is already there. Nor is there any sense in which their explanations are finally "correct." No ultimate red light comes on. None is necessary. There are simply better explanations discussed by communities of scholars who have contact with material reality, which is always understood in language, concepts, and imagery. From this point, pragmatists seem overly pessimistic about the possibility of explaining the real world. (p. 18)

We feel somewhat conflicted between arguments of the postpositivist and pragmatist positions regarding the nature of reality and our ability to understand causal relationships. Both paradigms agree that there is an external reality and that we should explore causal relationships.

Both paradigms also agree on the principle of the underdetermination of theory by fact, that is, that the results from any data set can be explained by multiple theories (Reichardt & Rallis, 1994).

One group believes that we should strive for constantly better explanations of reality and causality, while the other believes that we should concur with those explanations of causality and reality that are closer to our own values because we will never be able to understand them absolutely. Given that there are multiple explanations of the results from any research study, the choice comes down to either the "better" explanation (postpositivist) or the explanation that is closer to the researchers' values (pragmatist). The choice between the "better" explanation and the one closer to the researcher's values will often be the same given that the researcher designed the study and gave the constructs their operational definitions.

The basic difference between the two viewpoints relates to optimism regarding finding the truth. On this issue, our position can best be described as cautiously optimistic pragmatism.

The Intuitive Appeal of Pragmatism

Given all these considerations, pragmatism appears to be the best paradigm for justifying the use of mixed method and mixed model studies

(Howe, 1988). Pragmatism is appealing (a) because it gives us a paradigm that philosophically embraces the use of mixed method and mixed model designs, (b) because it eschews the use of metaphysical concepts (Truth, Reality) that have caused much endless (and often useless) discussion and debate, and (c) because it presents a very practical and applied research philosophy: Study what interests and is of value to you, study it in the different ways that you deem appropriate, and use the results in ways that can bring about positive consequences within your value system.

DESIGN ISSUES ASSOCIATED WITH MONOMETHOD APPROACHES

During the monomethod period (Period I, described in Table 1.1), there was a definite link between the methods used in a study and the scientific paradigm within which the investigator worked. As noted in Chapter 1, methodological purists believed in the incompatibility thesis, which prescribed that QUANs could not use qualitative methods, and vice versa.

Traditional monomethod research not only was expected to adhere to one of the two main approaches but also was expected to be uniquely different from the other approach in the type of data collection and data analysis procedures as well as in the types of inferences that were derived from these data analyses. The following discussion indicates that the two monomethods, in fact, have many similarities.

A Comparison of Monomethod Prototypes

There are two prototypical monomethod designs: (a) the *laboratory experiment*, characterized by a controlled research environment in which a manipulation of a variable occurs and involving confirmatory investigations of an a priori hypothesis, and (b) the *descriptive case study*, characterized by a natural environment in which no manipulation of any variable occurs and involving exploratory investigations.

These traditional research techniques have often been distinguished from each other on three major dimensions. The first dimension is the presence/absence of the *manipulation of* independent variables. The second dimension concerns the setting of the study (*natural setting* versus *controlled setting*). The third involves the presence/absence of prior hypotheses and/or predictions regarding the direction of findings.

BOX 2.1
The MAXMINCON Principle

In discussing the research design, Kerlinger (1986) summarizes different design issues in what he calls the *MAXMINCON* principle. Understanding the three components of the principle is a necessary step for doing research. The three components are to MAXimize the experimental variance, MINimize the error variance, and CONtrol the extraneous variance.

MAXimizing the experimental variance refers to the necessity of allowing enough difference between groups (or levels of an independent variable) to allow the effect to occur. For example, if two teaching methods are not different from each other, their differential effects are not detectable, even though they might be very effective. In Kerlinger's own language, "design, plan, and conduct research so that the experimental conditions are as different as possible" (p. 287).

MINimizing the error variance provides power for detecting differences between groups or relationship between variables. These random fluctuations are similar to having constant fluctuating noise when you are trying to comprehend a conversation (signal). The greater the variation in noise, the more difficult it is to comprehend the signal. Error variance is the result of random fluctuations in reactions, behaviors, and/or measurement. Unreliability of measurement is one source of such error. Individual differences are another source. Usually, as the number of observations (sample size) increases, with this latter source, random errors cancel each other out.

CONtrol of extraneous variables means that all competing variables that might affect the dependent variable should be removed (controlled). In the absence of such controls, one is unable to make inferences regarding the main independent variables of the study. For example, if gender is related to achievement along with teaching method, differences between groups of students might not be attributable to teaching method.

Although the MAXMINCON principle might seem more applicable to the experimental method than nonexperimental and/or qualitative methods, it is applicable to any research. The degree of one's confidence in a research finding regarding a relationship (what is called "internal validity" by QUANs) depends on the researcher's ability to rule out competing explanations for the results.

Much of the controversy over monomethod approaches revolves around the first two dimensions or, more specifically, the issues of manipulation and control. The *MAXMINCON Principle* of Kerlinger (1986) presents an excellent summary of these issues. It is described in Box 2.1.

Are the Two Monomethod Prototypes Actually at Opposite Extremes?

As we discussed before, instead of posing either-or dichotomies when discussing research design issues, it is more productive to consider these issues as continua. For instance, it is more productive to consider the purely quantitative studies at one end of a continuum and the purely qualitative studies at the other end, with a wide variety of designs between. This preference for a continuum reflects the importance of looking at research design issues as shades of gray rather than as black or white. In fact, it is not even clear that the two research prototypes (experiment, case study) are actually that different from one another if you make one major assumption: that the purposes of both quantitative and qualitative research include answering how and why questions. (For a discussion regarding questions of causality, see Shadish, 1995.)

As indicated in Table 2.1, the philosophical positions concerning the possibility of making causal linkages range widely from the positivists to the constructivists. It is our position, however, that when it comes to the actual conduct of research studies, many researchers working within the qualitative case study tradition also try to answer causal questions. Just as many quantitatively oriented methodologists have adopted some of the tenets of constructivism, many qualitatively oriented methodologists believe that causal linkages are possible (see Shadish, 1995, for a review), although they are more cautious in making them due to the difficulties in controlling events in natural environments.

We do not believe that most researchers (using qualitative, quantitative, or mixed methods) are content merely to say that "something happened"; we believe that they want to explain how or why it happened. For instance, in the Whyte (1943) classic case study summarized in Box 2.2, he described causal relations among variables such as social structure, group structure, and career advancement. Yin (1993) convincingly argued that case studies should go beyond descriptive questions (who, what, where, how many, how much) to answer how and why questions (as do experiments and historical analysis, according to Yin).

Assuming that qualitative researchers are interested in studying causality, it is informative to compare purely quantitative studies and qualitative studies to see just how different or similar they are. We will now briefly compare laboratory experiments and descriptive case studies on the three dimensions used to distinguish them above: the manipulation of variables, the type of environment in which the study occurred (natural versus controlled), and the nature of the investigation (confirmatory versus

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BOX 2.2
An Example of a Qualitative Case Study

Street Corner Society (1943), by William F. Whyte, has for decades been recommended reading in community sociology. The book is a classic example of a descriptive case study. Thus it traces the sequence of interpersonal events over time, describes a subculture that had rarely been the topic of previous study, and discovers key phenomena—such as the career advancement of lower income youths and their ability (or inability) to break neighborhood ties. The study has been highly regarded in spite of its being a single-case study, covering one neighborhood ("Cornerville") and a time period now nearly 50 years old. The value of the book is, paradoxically, its generalizability to issues on individual performance, group structure, and the social structure of neighborhoods. Later investigators have repeatedly found remnants of Cornerville in their work, even though they have studied different neighborhoods and different time periods.

SOURCE: From Yin (1993).

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exploratory or a priori versus no a priori hypotheses). To set the stage, and also to provide a study to be compared with Whyte's research (Box 2.2), an example of a traditional quantitative confirmatory study (Latane & Rodin, 1969) is presented in Box 2.3.

Comparison of the Monomethod Prototypes: Manipulation of Variables

The traditional distinction between experiments and case/field studies states that experiments involve the manipulation of variables, while case studies do not. In fact, investigators conducting case studies often try to maximize the differences in the cases that they observe (the *MAX* in the *MAXMINCON* principle).

Experimental studies are usually categorized into laboratory, field, and natural experiments. The experimenter is the main agent of change in the independent variables in the first two types of experiments. In the third type, however, change in the independent variable happens as a result of other forces (social institutions, law, nature, and so on). The researcher's role is to compare the group and/or setting that has undergone such distinct change with groups or settings without such changes. While the "treatment" in case studies occurs through such "natural" manipulations, investigators often use qualitative sampling schemes (e.g., sampling extremes,

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BOX 2.3
An Example of a Traditional Quantitative Confirmatory Study

Latane and colleagues undertook a series of experiments in the late 1960s to further understand the phenomenon called "bystander intervention," which concerns the willingness of strangers to assist someone in distress. These experimental social psychologists became interested in this issue after a well-publicized case (i.e., the stabbing death of Kitty Genovese in New York City in 1964) in which a young woman was murdered while 38 of her neighbors watched but did nothing.

The researchers developed a theoretical position that predicted that the larger the number of "bystanders," the less likely it would be that a victim would receive help. They reasoned that noninterventions were acts of conformity: Individuals took their cues in responding to a victim's distress by observing others, and if the others did not help, this allowed them to interpret nonintervention as the appropriate behavior.

In one of their experiments, Latane and Rodin (1969) conducted an experimental situation around "a lady in distress": a female experimenter who staged an "accident" outside of the view of the subject, behind an unlocked collapsible curtain, but within the subject's hearing ranges. In the study, subjects heard a tape recording of the young woman climbing a chair, then falling, and then calling for help.

In one experimental condition, the subject was the only other person in the setting. In the other experimental condition, there was a "stooge," an accomplice of the experimenter who purposefully did not respond to the cries of the "victim." The theoretically derived prediction was supported: In the "alone" condition, 70% of the subjects responded to the "lady in distress," while in the "stooge" condition, only 20% of the subjects offered help.

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maximum variance sampling) to highlight the differences between the groups they are studying. For instance, effective schools have been compared with ineffective schools to ascertain the differential impact that such schools have on students' learning (e.g., Brookover, Beady, Flood, Schweitzer, & Wisenbaker, 1979; Teddlie & Stringfield, 1993).

The major difference between case studies of very different groups and laboratory/field experiments using groups that have received different experimental treatments is that one involves a manipulation of nature and the other involves a manipulation conducted by the investigators. Such a methodological distinction does not seem to constitute a rigid dichotomy between case studies and experiments but a continuum from cases in which

the investigator is the agent of change in the "treatment" to cases where the investigator has no control over such changes. (An extended example in Chapter 5 further illustrates the differences in control of "treatment" that different investigators can have when studying the same phenomenon.)

Comparison of the Monomethod Prototypes: Natural Versus Controlled Settings

The usual or traditional distinction between experiments and case studies states that experiments occur in controlled settings, while case studies occur in natural settings. From a research design perspective, the essence of this distinction concerns the control of extraneous variables (the *CON* component of the *MAXMINCON* principle) and the reduction of the error variance within treatment (the *MIN* component of the *MAXMINCON* principle).

Research conducted in controlled settings is more likely to have reduced the effect of extraneous variables and error variance than research conducted in natural settings. Nevertheless, there will always be uncontrollable variance, and even the best designed experiments will never eliminate all of it. In fact, conducting research in controlled settings can result in different types of extraneous variables, such as the *experimenter bias effect* (Rosenthal, 1976) in which experimenters' expectancies are somehow communicated to their subjects in a manner that affects their behavior.

On the other hand, well-designed case studies that include "controls" for important variables can yield results that are relatively devoid of the impact of extraneous variables and error variance. For instance, case studies comparing effective and ineffective schools have controlled for the following variables in their designs: the socioeconomic status of the students who attend the schools, the ethnic composition of the schools, the school district in which the study was conducted, the community type in which the study was conducted, the grade levels that are studied, the types of subject matter that is taught and tested, and other factors (e.g., Chrispeels, 1992; Hallinger & Murphy, 1986; Stringfield & Teddlie, 1990; Teddlie & Stringfield, 1993).

Of course, this discussion relates to the general issues of the internal and external validity of research studies, which will be discussed more thoroughly in Chapters 4 and 5. The point to be made here is that the distinction between natural settings and controlled settings is a continuum, not a rigid dichotomy, in terms of important issues such as the control of extraneous variables and error variance. Furthermore, experiments can occur in natural

settings (field experiments) and case studies can occur in controlled settings (clinical case studies).

Comparison of the Monomethod Prototypes: Confirmatory Versus Exploratory Investigations

The traditional distinction between experiments and case studies states that experiments are confirmatory in nature, involving the use of a priori hypotheses, while case studies are exploratory in nature and do not involve hypothesis testing. There are numerous counterexamples in which case studies did have a priori hypotheses and in which experiments did not.

This issue relates to the research cycle illustrated in Figure 2.1 in which inductive and deductive reasoning are seen as complementary, alternating components of the overall process of studying a phenomenon. Again, the distinction between experiments and case studies is blurred, with either approach being appropriate for either confirmatory or exploratory studies.

Thus the two prototypes of the quantitative (laboratory experiment) and qualitative (case study) approaches are not that different from one another in terms of the three dimensions that we have examined, provided that investigators are interested in causality. Yin (1994) recently came to the same conclusion when examining commonalities between qualitative and quantitative research. He listed four commonalities in examples of exemplary quantitative and qualitative studies: thorough coverage and investigation of all evidence, constant awareness and testing of rival hypotheses, results with significant implications, and investigatory expertise about the subject.

A TAXONOMY OF TRADITIONAL DATA COLLECTION TECHNIQUES IN THE BEHAVIORAL AND SOCIAL SCIENCES

A taxonomy of traditional behavioral and social science research designs is contained in Table 2.2. We have labeled this table a taxonomy of "data collection techniques" rather than research designs, a point that we will explain later in this section. Within this table, common types of designs are characterized in terms of the three dimensions of analysis presented above. Information in this table indicates that there are three general groups of traditional designs:

Table 2.2
A Taxonomy of Traditional Data Collection Techniques in the Social and Behavioral Sciences

Data Collection Technique	Setting		Manipulation		Orientation	
	Controlled	Natural	Yes	No	Confirmatory	Exploratory
Lab experiment	X		X		X	
Single-subject study	X		X		X	
Field experiment		X	X		X	
Survey study		X		X	X	X
Relationship studies		X		X	X	X
Prediction studies		X		X	X	X
Archival studies		X		X	X	X
Causal-comparative		X		X	X	X
Historical research		X		X	X	X
Case/field study		X		X	X	X
Descriptive research		X		X		X
Developmental research*	X	X		X		X

*Developmental research includes longitudinal, cross-sectional, shortened longitudinal, and similar research (see Salkind, 1997). Although these methods are classified as either descriptive or survey, we think they should be classified as a separate category because the investigators might use a combination of methods in such studies, from qualitative case studies to correlation/prediction and quasi experiments.

1. Group 1 controls settings and/or manipulates variables, with the objective of testing tentative predictions or hypotheses (confirmatory). Designs in this group include laboratory experiments, single-subject studies, and field experiments.

2. Group 2 neither controls settings nor manipulates variables, and may be confirmatory or exploratory. Designs in this group include surveys, correlational/archival studies, causal comparative studies, historical studies, and case studies.

3. Group 3 neither controls settings nor manipulates variables, and focuses on exploratory issues. Designs in this group include descriptive and ethnographic studies.

While this taxonomy has some interesting contrasts, it is unsatisfactory as an efficient way of classifying all of the different types of designs in the behavioral and social sciences. The first problem with this taxonomy concerns the number of designs, which in Table 2.2 is 12. Brewer and Hunter (1989) constructed a similar taxonomy with four types of designs. Yin's (1993) analysis included five types of designs. Research books from

different fields have different elements in their taxonomies due to the idiosyncratic nature of the areas of study.

Second, this taxonomy is based on a set of three dichotomies that are a bit "fuzzy," as indicated by the discussion in the previous sections of this chapter. For instance, both the confirmatory and the exploratory dimensions are checked for 4 of the 12 research designs. Although distinctions between types of setting and the presence/absence of manipulations are clearer in Table 2.2, the discussion above indicates that experiments and descriptive case studies are more alike than indicated in the table. For example, confirmatory case studies have design characteristics intended to control certain extraneous factors in a natural setting.

A final problem with the taxonomy in Table 2.2 concerns the methodological "baggage" that the designs carry as they cross interdisciplinary lines. This "baggage" occurs due to different disciplines' preconceived notions about designs that have been around for decades. A good example would be case studies. Can case studies be confirmatory? Yin (1993), writing from an experimental psychology background, says yes. Many anthropological and educational ethnographers would say no.

We propose a more logical taxonomy for mixed model designs, based solely on the intrinsic characteristics of those designs, in Chapter 3. We have sought to avoid value-laden terms in this taxonomy of mixed model studies (see Table 3.1 in Chapter 3).

We have referred to the taxonomy in Table 2.2 as a set of *data collection methods* rather than *research designs* or research types, as they are called in other standard textbooks (e.g., Gall, Borg, & Gall, 1996). This change in nomenclature occurred for two reasons:

1. We prefer the nonoverlapping taxonomy of research designs (to be discussed in Chapter 3) to the traditional taxonomy found in Table 2.2, with its inherently overlapping categories and ambiguous cross-disciplinary distinctions.

2. The categories in Table 2.2 are, in fact, basically different approaches for gathering data. These approaches have emerged from all the social and behavioral sciences: laboratory experiments from psychology; single-subject designs from school and educational psychology and special education; field experiments from education and evaluation; surveys from sociology; correlational and archival studies from several fields including sociology; causal comparative (ex post facto) studies from evaluation, education, and sociology; historiography from history; case/field study and ethographic studies from anthropology primarily, with contributions from sociology; and descriptive studies from virtually all the social and behavioral sciences.

These approaches represent the traditional normative methods for collecting data from these different disciplines. As such, they have been confused with research designs from those fields: experiments with psychological methods, surveys with sociological methods, ethnographic studies with anthropological methods, historiography with historical methods, causal-comparative studies with evaluation research, and so on.

In fact, there is no reason that sociologists (or any other group of scientists) shouldn't be able to use experiments, surveys, ethnographic studies, historiography, quasi experiments, and all of the other types of data collection methods while doing sociological studies (or other types of studies). Some of the most accomplished researchers have often used research designs not indigenous to their own discipline to answer their research questions. There will be more discussion of these specific data collection methods in Chapter 5.

NOTE

1. This methodology (Guba & Lincoln, 1994, p. 111) consists of (a) individual constructions being elicited and refined through interaction "between and among" researcher and respondents; (b) the interpretation of these constructions through hermeneutic techniques and dialogue among participants; and (c) the determination of a consensus construction. (According to Kneller, 1984, *hermeneutic philosophy* refers to the "philosophic study of understanding," which is "considered as interpretive" [p. 66]. Hermeneutics refers to the analysis of text, or literature.)