

CHAPTER 2 CLASSIFYING RESEARCH

2	Classifying Research	2
2.1	The Extent of Researcher Manipulation of Antecedent Conditions.....	6
2.1.1	Stage of the Inquiry.....	7
2.1.2	Laboratory versus Field Research	8
2.1.3	Research Interests of Psychologists.....	10
2.2	The Extent To Which The Researcher Limits Response Alternatives.....	17
2.2.1	Surveys	18
2.2.2	Archival Research.....	20
2.2.3	Participant Observation	21
2.2.4	Phenomenological Research	25
2.3	Naturalistic Research Defined.....	27
2.4	Idiographic Versus Nomothetic Research	29
2.4.1	The Single-Case Experiment.....	32
2.4.2	The Case Study.....	33
2.4.3	Psychobiography and Life Narratives.....	35
2.5	The Value of Diversity	37
2.6	Key Terms.....	37
2.7	Key People.....	38
2.8	Review Questions	39

2 CLASSIFYING RESEARCH

The goal of research is to answer a question in such a way that it is convincing and can be defended with cogent arguments. Methods are to be developed as responses to specific questions. Donald Polkinghorne

When Jane Goodall was just one-year-old, her mother gave her a large, hairy, toy chimpanzee named Jubilee, after the first chimpanzee born in captivity at the London zoo. Perhaps it was Jubilee that helped to inspire Goodall's lifelong fascination with studying animals. Whatever the origin, this interest was evident from very early on. At four years of age, Jane hid in a stuffy henhouse for hours to see how hens lay eggs. By the time she was eight, she had decided that when she grew up she would move to Africa and live among the wild animals.

In her late teens, this dream came true. Soon after moving to Kenya at the invitation of a friend, Goodall met Louis Leakey, the curator of the National Museum of Natural History in Nairobi and a renowned physical anthropologist. Leakey told Goodall about a group of chimpanzees living on the shores of Lake Tanganyika. Studying them, he believed, "might shed light on the behavior of our stone age ancestors" (van Lawick-Goodall, 1971, p. 6). When Leakey asked her if she would be "willing to tackle the job," Goodall enthusiastically agreed. Much of her life since has been spent in the forests of Gombe observing that group of chimpanzees—collecting the observations needed "to piece together bit by bit, the overall pattern of chimpanzee life" (Goodall, 1986, p. 51).

At first, Goodall's observations were made from a rocky peak, which offered her a good site for watching some happenings in chimpanzee life. Later she began to shadow individual chimpanzees (all assigned names, like David Graybeard, Hugo, and Fifi!) for hours on end, meticulously recording every event that caught her eye. The stories that Goodall tells have transformed our understanding of these primates and shattered many widely accepted myths as well.

Contrary to accepted knowledge, Goodall discovered that chimpanzees, formerly thought to be strictly vegetarian and invariably peaceful, eat meat, use weapons, and engage in gang attacks on other chimpanzees. Like people, they have individual personalities, spend much of their youth at play, use tools, establish close family ties, and display generosity. Because of observations such as these, the U.S. government's guidelines regulating the care and treatment of animal subjects in research now require researchers to make efforts to promote the psychological well-being of their primate charges (see Chapter 7, Ethics of Research).



Jane Goodall and a chimp at the Gombe Stream Research Center in Nigeria in 1972

Ronald Kessler and his colleagues (1994) at the Institute of Social Research at the University of Michigan used very different data collection strategies from Goodall's. Kessler directed the National Comorbidity Survey (NCS), "a congressionally mandated survey designed to study the comorbidity of substance abuse disorders and nonsubstance psychiatric disorders in the United States" (Kessler et al., 1994, p. 8). (*Comorbidity* is the presence of two or more illnesses or abnormal conditions in the same person.) According to Kessler and his coauthors, "The NCS is the first survey to administer a structured psychiatric interview to a representative national sample in the United States" (Kessler et al., 1994, p. 8).

Kessler's group had responded to a congressional mandate calling for information on the prevalence of psychiatric disorders in the United States. To collect such data, needed for national health care planning, an interview procedure had to be developed that would allow nonclinical interviewers to reliably diagnose the psychiatric disorders of members of the general public. Kessler et al.'s state-of-the-art structured diagnostic interview, the Composite International Diagnostic Interview, was designed to do this.

Using this instrument, eight thousand people, representing all 15- to 54-year-olds in the civilian noninstitutionalized population of the United States, were diagnosed according to which, if any, psychiatric disorders they had experienced in the previous year, or at some point in their lives. The diagnoses were based on the DSM-III-R (*Diagnostic and Statistical Manual III— Revised*) of the American Psychiatric Association. Although this manual has since been revised, at the time this diagnostic system was the accepted standard among mental health practitioners.

Like Goodall's findings, the results of this ground-breaking survey were unexpected. Almost half of those interviewed, both male and female, had had a major psychiatric disorder some time during their lives. About a third had experienced a psychiatric disorder in the 12 months prior to the interview. In addition, the "results show that while a history of some psychiatric disorder is quite common among persons

aged 15 to 54 years in the United States, the major burden of psychiatric disorder in this sector of our society is concentrated in a group of highly comorbid people who constitute about one sixth of the population" (Kessler et al., 1994, p. 11). Data on the incidence and nature of psychiatric disorders, according to sex, race, socioeconomic, and other factors, are reported later in this chapter.

Although scientists as a group share an allegiance to scientific method—to the goals, practices, and rules of evidence that we discussed in Chapter 1, Goodall's and Kessler's studies, combined with the research we discussed in Chapter 1, illustrate that what psychologists actually do in their research is anything but uniform. Because the kinds of questions that investigators hope to answer are so varied, the methods they use also must be. Research does not take place in the abstract. Deciding on the particulars of a study is a complex process that is guided in large measure by the questions the researcher hopes to answer. The *research designs* used by psychologists, that is, their general strategies for collecting observations, reflect the diversity in research questions they pose and the other choices they make as they translate their abstract ideas into concrete actions.

In this chapter, we present several dimensions for classifying the research designs used by psychologists today. We describe the essential features of the basic designs and the kinds of questions they are most suited to answering. Most of the research strategies we outline in this chapter are discussed more fully later in the book. There you will learn how the designs were developed, their strengths and limitations, as well as improvements that have been made in them since they first were introduced.

Our presentation of research designs is organized using a classification scheme developed by Edwin P. Willems (1969). Willems's classification focuses on differences in what psychologists do in conducting studies, assigning these activities to a position in a "two-dimensional descriptive space." The first dimension describes "the degree of the investigator's influence upon, or manipulation of, the antecedent conditions of the behavior studied." The second "describes the degree

to which units are imposed by the investigator upon the behavior studied" (Willems, 1969, p. 46).

2.1 THE EXTENT OF RESEARCHER MANIPULATION OF ANTECEDENT CONDITIONS

Willems's first dimension is one that most psychologists would use to classify research designs, one that we introduced in the last chapter: the distinction between *experiments* and *observational studies*. In *experiments*, the researcher manipulates the test situation to create the precise conditions needed to test the hypothesis.

In *observational studies*, hypotheses are tested by "seeking out, or waiting for cases where the specified conditions are realized by nature, and then checking whether [the event] does indeed occur" (Hempel, 1966, p. 20).

According to Willems, research studies can be roughly arranged according to the degree —from high to low—of the investigator's manipulation of antecedent conditions.

Experiments would be at the high end of this dimension; passive observational studies would be low because their observations are selected rather than manipulated. But at the lowest point on this dimension, we would place research like Jane Goodall's *naturalistic observation*. Naturalistic observers try to observe the pattern of events in a given situation without pinpointing any particular antecedents as being of special interest.

When Mesmer wanted to test the effects of magnets in relieving Fraulein Oesterline's symptoms, he did an *experiment*. When he wanted to see how the waxing and waning of the moon influenced her, a *passive-observational study* was the order of the day. When the commissioners were trying to learn as much as they could about the magnetic treatment, they went to the public sessions and observed, watching everything that went on (*naturalistic observation*). Later they experimented to test their suspicion that suggestion played an important role in the effects attributed to magnetism. Decisions like

these about whether to use an experimental or observational approach, depend on what already is known about the behavior under study, on the setting where the research will take place, and on the type of question the researcher hopes to answer.

2.1.1 Stage of the Inquiry

Research on previously unexamined behaviors usually begins with relatively unstructured fact-finding. Such *exploratory research* is intended to chart new frontiers of knowledge by observing and identifying regularities in the phenomena of interest. Early in an inquiry, the researcher often is unprepared to select particular events to observe and tries instead to discover what is important by observing the full range of behaviors that emerges, interfering as little as possible with ongoing events.

When researchers begin to note patterns in the phenomena being studied, to observe that certain events regularly occur together or that one phenomenon regularly precedes another, and to classify phenomena according to similarities and differences, the researcher moves from pure description to analysis. At this point, new research designs, which allow the researcher to assess the nature and extent of relationships, become appropriate. Finally, when theories to account for relationships suggest themselves, still other designs are needed to test them.

With few exceptions, *experiments* are concerned with testing hypotheses. Kohler was testing a hypothesis about animal learning derived from Gestalt theory against Thorndike's stimulus-response theory. The experiments on animal magnetism tested the commissioners' suggestion theory against Mesmer's physical one. *Observational studies* are a necessary alternative to experimentation for hypothesis testing when the antecedents of interest cannot be manipulated for practical reasons (Mesmer could not create the phases of the moon) or for reasons of morality (we cannot abuse children to study the effects on them).

One type of hypothesis of special interest to scientists is cause-effect. Causal hypotheses assert that particular antecedent conditions lead to

particular consequents. The logic of how to establish clear-cut cause-effect relationships by controlling for rival hypotheses was first formally presented by John Stuart Mill in the 19th century. Mill's methods are the focus of Chapter 3, Control in Experimentation.

When conditions permit the use of experiments, it is generally conceded that they, rather than observational studies, are the method of choice for testing hypotheses of causation. In the words of Lee J. Cronbach:

The well-known virtue of the experimental method is that it brings situational variables under tight control. It thus permits rigorous tests of hypotheses and confident statements about causation. Cronbach, 1957, p. 672

Although experimentation has this advantage over observational designs, it would be a mistake to consider the observational design only as a poor substitute for experimentation. As we will see, cause-effect is not the only type of relationship of interest to psychologists, and the experiment often is not the best method for research.

2.1.2 Laboratory versus Field Research

Psychologists also label research according to where it takes place.

Laboratory research, as its name implies, is conducted in the laboratory, where antecedent conditions can be strictly controlled.

Willems's analysis reminds us that the degree to which the antecedents can be controlled in research is a continuum rather than an either-or matter. Precise control over antecedent conditions can be achieved in the laboratory, somewhat less in places like zoos, prisons, schools, or hospitals, and least of all when studying animals in the wild, or people as they go about their daily activities.

Field research takes place in settings located outside the laboratory, like clinics, schools, or industry, where it is more difficult to control the antecedents experienced by subjects. Collectively, such settings are called the field.

Both experiments and observational studies can be conducted in laboratory or field settings. Experiments done outside the laboratory are called *field experiments*; observational studies in such settings are called *field studies*. When nature creates the kinds of variations in events that might be sought in laboratory research, the resulting study is called *a natural experiment*. Chapter 10, Field Research, discusses the contributions and special challenges of field research.

Some critics of psychological research believe that we ought to do research in field settings before plunging into laboratory experimentation. They base their conclusions on discrepancies between the findings of laboratory and field research. The following example shows how field studies provide an important check on laboratory findings.

Henry K. Beecher (1959, 1960), a medical researcher, was interested in studying the effectiveness of narcotics, like morphine and other analgesics, in relieving people's pain. He found that small doses of these drugs were remarkably effective in relieving the chronic pain of malignant disease and the acute pain caused by surgical wounds. Increasing doses produced comparable increases in pain relief for both types of pain. Placebos also proved to be effective in relieving pain from these sources.

But Beecher found that drugs and placebos do not work this way when the pain is created artificially in the laboratory, as it is in many experiments. In his trials, even large doses of the drugs were ineffective in controlling experimentally induced pain, as were placebos. In Beecher's view, these results may stem from the fact that fear or anxiety usually accompanies the pain of disease or injury, whereas this is not the case with experimentally induced pain. Beecher's findings remind us to be cautious in generalizing results from the laboratory to the field.

2.1.3 Research Interests of Psychologists

In 1952, the Policy and Planning Board of the American Psychological Association (APA) began a project of considerable scope, involving the collection of empirical data from psychologists throughout the country. The project had two goals. Project A was intended to assess the status of psychological science—its methodology, its theories, and its empirical knowledge. Project B looked at professional relations in psychology by collecting and analyzing empirical data from a variety of sources, including practicing psychologists.

Sigmund Koch, a psychologist at Duke University, was put in charge of Project A. Koch asked the country's leading psychologists to write chapters discussing their work. The results were published in six volumes, edited by Koch, which provided psychologists of the day with a summation of what was known to scientific psychology. These books now are considered classics in the field (Koch, 1959-1963).

Project B, directed by Kenneth E. Clark, a psychologist at the University of Minnesota, was empirical. It required a central research staff, the assistance of committees of the APA and its divisions, as well as the cooperation of psychologists across the country, who served as subjects in the research (APA, 1952, p. 566). Once funding for Project B was received from the National Science Foundation, the committees set to work to decide how to learn more about psychology as a profession. Robert L. Thorndike, a member of one committee, had a promising idea about how to study the professional values of psychologists. If psychologists were given the names of important figures in the discipline's history and asked to rate the value of their contributions, he reasoned, their judgments would be shaped by their values. He was given the go-ahead, and the project was under way.

Thorndike first prepared a list of psychologists who were judged by colleagues, students, and himself to have made important contributions to the field. To know the names of these psychologists is to know a great deal about the history of our discipline and the diversity of interests and methods of those who have been a part of it. Thorndike organized the names of the psychologists into groups of three, each representing equally significant contributions but varying

as much as possible in the nature of those contributions. The triads were put together in an inventory that was sent to two hundred Fellows of the APA for their ratings. They were asked to rank the three psychologists in each triad in order of the importance of their contributions to the field .

One hundred and twenty-five inventories that were returned in usable shape were analyzed. Thorndike's classification of research contributions and his findings on the preferences of psychologists were published in the *American Psychologist*, the journal of the APA (Thorndike, 1954). Most important for our purposes is Thorndike's finding that the evaluations given to the psychologists depended on the type of work done by the psychologists rating them. In a nutshell, experimental psychologists preferred experiments conducted in the laboratory. Clinicians and psychologists in other applied fields saw nonexperimental contributions as most valuable.

Because Thorndike's data were obtained from a diverse group of psychologists from across the United States, Lee J. Cronbach, then president of the APA, concluded that its results provided a clear picture of how the research interests of psychologists differ. In his presidential address to the APA membership, Cronbach (1957) argued on the basis of these data for the existence of "two historic streams of method, thought, and affiliation which run through the last century of our science. . . . Psychology continues to this day," he went on, "to be limited by the . . . dedication of its investigators to one or the other method of inquiry rather than to scientific psychology as a whole" (Cronbach, 1957, p. 671). For this reason, Cronbach titled his speech "The Two Disciplines of Scientific Psychology."

According to Cronbach, psychologists fall into two groups— "*experimenters*" and "*correlators*," distinguished according to whether they most value experimental or observational (also called correlational) research methods.

Experimenters and correlators differ in their goals and in their standard operating procedures. Correlators use the design we have called passive observational and often use a statistic called the correlation coefficient, which we discuss in Chapter 5, Correlation.

Experimenters want to vary environmental events and control differences between subjects. To experimenters, individual differences between subjects are "an annoyance rather than a challenge" and they take pains to avoid them. Experimenters standardize the heredity and other life experiences of their animal subjects and select their human subjects "from a narrow subculture." (College sophomores are used so frequently in psychological experiments, for example, that they have been called "psychology's fruit flies"!)

Correlators are interested in studying the very differences between subjects that experimenters try to eliminate. Correlators want to keep environmental conditions constant and study the effects of individual differences between subjects. They want to know how "already existing variation between individuals, social groups, and species" that results from biology or social circumstances influences their adaptation. "What present characteristics of the organism determine its mode and degree of adaptation?" is the question that correlators seek to answer (Cronbach, 1957, pp. 671, 674).

From our discussion in Chapter 1, you already are familiar with the work of a number of experimenters—Kohler, Skinner, and the commissioners are good examples—so we will now turn to some examples of research done by psychologists who fit Cronbach's criteria for correlators. In the remainder of this section, we will look at examples of correlational research testing, respectively, hypotheses of causation, coexistence, and sequence.

2.1.3.1 Testing causal hypotheses.

Thomas Elbert and his colleagues (1995) studied the impact of musical experience on the cerebral cortex (the part of the brain associated with higher functions) of stringed instrument players (a cause-effect hypothesis). The study compared the cortical functioning of musicians (six violinists, two cellists, and one guitarist) and nonmusicians, to

learn whether years of musical practice would affect brain functioning. Previous experimental research on monkeys had revealed that prolonged tactile stimulation of the fingers results in increased cortical representation for the portion of the fingers stimulated. String players were chosen for the study on humans because playing stringed instruments requires continuous fingering by the left hand with much less finger movement and tactile stimulation for the right hand.



Building a brain for music

The subjects were all between 21 and 27 years of age, and the musicians had been playing from 7 to 17 years. If experimental manipulation of stringed instrument playing had been used in the research, it would have been impossible to study the impact of such prolonged experience. In the testing session, light pressure was applied to the subjects' first digit or fifth digit of either hand in separate trials, and records were made of their cortical functioning by means of magnetic source imaging. The results showed "that the cerebral cortices of string players are different from the cortices of [nonmusicians] in that the representation of the digits of the left hand is substantially enlarged in the cortices of string players" (Elbert, Pantev, Wienbruch, Rockstroh, & Taub, 1995, p. 305).

Figure 1, from the published report of this research, shows that the extent of the enlargement depends upon the age at which the musician first began to play. This result is something that would not have been detected without a correlational design. Although alternative interpretations of the results might be offered, the authors concluded, based on this and their experimental work with animals, that playing a stringed instrument leads to an increase in the cortical representation of the digits of the left hand.

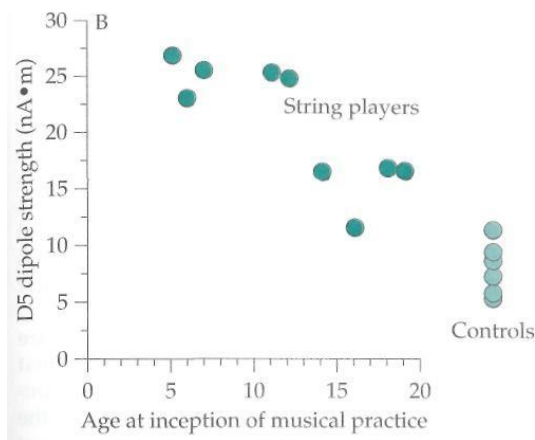


Figure 1. The size of cortical representation as a function of the age when musical practice begins (Elbert, T., Pantev, C, Wienbruch, C, Rockstroh, B., & Taub, E. (1995). Increased cortical representation of the fingers of the left hand in string players, 270, 305-7.)

2.1.3.2 Studying coexistence.

Correlational interests also prompted the data collection and analysis done by Kessler and his colleagues (1994). They wanted to find out the nature and extent of psychiatric disorders in various subgroups of their national sample—males versus females, urban versus rural residents, lower versus higher socioeconomic status, and blacks versus whites. They were interested in learning which types of people had which disorders so that planned mental health services would meet actual needs. Note that this hypothesis is not about cause and effect.

Kessler and his colleagues found that women experienced more affective disorders (except mania, for which there were no differences) and anxiety disorders; men, on the other hand, had higher rates of substance use and antisocial personality disorders. In general, the results showed that rates of psychiatric disorders decrease proportionately with increasing income and education (two indexes of socioeconomic status).

For the most part, differences between city and rural residents were not significant, and blacks were found to have significantly lower rates of affective disorders, substance use disorders, and lifetime comorbidity than whites. The authors found these last two findings particularly intriguing; residents of rural areas have lower income than urban dwellers, and blacks experience both financial difficulties and lower education, both factors that put people at risk for psychiatric disorder. For this reason, "future analyses of the NCS data will explore these patterns in more depth with the expectation that some as yet unknown resources protect rural people and blacks from the adverse psychiatric effects that we would otherwise expect to be associated with their stressful lives" (Kessler et al, 1994, p. 18).

2.1.3.3 *Testing hypotheses about sequence.*

Developmental psychologists are interested in charting the course of psychological development—in studying, for example, when and how particular cognitive abilities emerge and what problems typify different epochs of life. Although there are noncorrelational designs that can be used to learn about the sequencing of events, developmental psychologists frequently use one of two types of correlational design to study changes that occur over time.

Longitudinal studies collect observations on the same subjects on at least two separate occasions. *Cross-sectional studies* collect observations on subjects of different ages at one point in time.

The distinctive feature of the longitudinal design is that the same subjects are tracked over time. Such tracking allows the researcher to

study the stability and change of particular behaviors in a given subject and can yield information on the impact of early events on later development. Jane Goodall (1986) observed individual chimpanzees throughout their lives to learn how events that took place in their infancy and youth led to individual differences in the chimpanzees later in life. Jean Piaget (1954) also used a longitudinal design when he assessed changes in his children's cognitive abilities as they developed. Lewis Terman tested and retested a group of intellectually gifted children, his "Termanites," over many decades to learn how their extraordinary early intellectual achievement was related to their accomplishments later in life (Terman & Oden, 1947,1959).

In a cross-sectional design, groups of subjects of different ages are tested to discover how age relates to the behaviors of interest. Recall that Kessler et al.'s survey sampled the 15- to 54-year-old civilian noninstitutionalized population of the United States. When the authors broke down the incidence of psychiatric disorders according to age, they found the highest prevalences among people 25 to 34 years of age, and declining prevalences at later ages.

The advantage of the cross-sectional design over the longitudinal design is the savings in time required to conduct the research. Longitudinal studies require a lengthy time commitment of both the subjects and the researchers; the researcher is likely to stick with it, the subjects may not. Subjects are less likely to drop out of cross-sectional studies, since they participate only once. This advantage must be weighed against a major disadvantage of the design; namely, that the subjects in the different age groups differ from one another in many ways other than age. The effects of individual differences in personality and life experience are not a problem in longitudinal studies because the same subjects are tested at the different ages.

Our brief survey of correlational studies should convince you of the importance of correlational designs in the research of psychologists. Indeed, in the years since Cronbach wrote his classic paper dividing psychologists into "experimenters" and "correlators," the value of multiple methods in psychological research has been increasingly recognized. But back in 1957, Cronbach, a correlator himself, felt the

need to passionately defend his method against the criticisms of those in the other camp—the experimenters. Calling for a "true federation of the disciplines," Cronbach wrote:

The correlational method, for its part, can study what man has not learned to control or can never hope to control. Nature has been experimenting since the beginning of time, with a boldness and complexity far beyond the resources of science. The correlator's mission is to observe and organize the data from Nature's experiments. As a minimum outcome, such correlations improve immediate decisions and guide experimentation. At the best, a Newton, a Lyell, or a Darwin can align the correlations into a substantial theory. (Cronbach, 1957, p. 672)

2.2 THE EXTENT TO WHICH THE RESEARCHER LIMITS RESPONSE ALTERNATIVES

To illustrate his second dimension, Willems (1969) described a study he conducted to find out what attracted high school students to five extracurricular activities. He varied the way participants in his study were allowed to respond. In the first procedure, an interview, the students simply were asked, "What, if any, were for you real reasons for or pulls toward attending this activity?" In the second, the students were required to sort cards, on each of which was a particular reason for attending. They sorted the cards into two piles—those that applied to them and those that did not. The third procedure was a checklist on which the students were asked to check all of the reasons that applied to them. Willems found that "the interview method, the technique with the least restriction of response alternatives and lowest on [his second] dimension" yielded the best predictions (Willems, 1969, p. 48).

Willems's second dimension, then, has to do with "the degree to which units are imposed by the investigator on the behavior being studied" (Willems, 1969, p. 46). Such

imposition occurs when the researcher restricts the subjects' behavior so that they can respond only in certain ways, as was done in the study described above, and when the researcher records only limited aspects of the subjects' behaviors.

In studying conversations, for example, the researcher might record only the number of nouns and verbs spoken rather than the entire discussion. This dimension refers to restrictions imposed by the researcher during the data collection, not to any structuring of subjects' responses later for the purpose of analysis. As we will see in the discussion that follows, this dimension also proves useful for classifying psychology's research designs.

2.2.1 Surveys

The survey is a method of systematically collecting data from people about their behaviors, attitudes and beliefs. Subjects for surveys are carefully selected to represent the group of people about whom the investigator intends to draw conclusions.

Although variations have been built into the questions of some surveys as experimental manipulations, for the most part, surveys are passive observational studies. Survey researchers compare the responses of groups of subjects sorted according to particular attributes or past experiences. Kessler et al.'s study of psychiatric disorders, with which we began this chapter, is a good example of a survey.

The subjects in a survey can be interviewed in person, as they were in Kessler's study, or on the telephone; or they might complete a self-administered paper-and-pencil or computerized questionnaire. Whatever the mode of data collection, the questions in a survey are carefully constructed to yield the precise information that the investigator is seeking. Usually surveys require respondents to choose between response alternatives that are supplied by the researchers; so most surveys would fall at the highly structured end of Willems's

second dimension. The exception would be surveys that use open-ended questions, comparable to essay questions on an exam.

Subject selection procedures in survey research have become highly sophisticated, ensuring that the characteristics of the subjects studied (called the sample) match closely with those of the larger group (the population) to which the researcher plans to generalize. Subjects are selected so that the various groups that compose the population of interest are represented, and in their correct proportions, and that there is no systematic bias in selecting participants from the groups. In the Kessler et al. study, for example, the subjects were selected so that they represented the 15- to 54-year-old, civilian, noninstitutionalized population of the United States.

As we will discuss more fully in Chapter 10, Field Research, the procedure used to eliminate bias in selecting subjects for research is *probability sampling*. In such sampling, subjects are selected from a particular population by chance, and because the research is anonymous and nonpainful, often a high proportion of those selected agree to participate.

The state-of-the-art in generalizing results precisely from a sample to a known population has been reached in public opinion research, where the intent frequently is to predict responses to events that have not yet happened— to forecast election results or to assess responses to proposals for social change, for example. In such research, it is particularly embarrassing, and obvious, when the poll fails to predict the event accurately.

Surveys are useful for collecting data on stable forms of behavior that subjects can answer questions about. Although the survey's structured response alternatives yield precise, quantifiable data on the behaviors, attitudes, and opinions of interest to the researchers, this structure also limits the usefulness of surveys for uncovering unanticipated possibilities. In this respect, the survey is very different from some of the other methods we consider later in this chapter.

2.2.2 Archival Research

The questions and results of some comprehensive national surveys are published so that other researchers, not involved in the study, can conduct their own analyses of the data. Results published in this manner are said to be archived, and research using these results is called archival research.

Archival research uses existing records, gathered originally for some other purpose, as data. An archival study might examine census figures; birth records; scores on tests administered in schools, clinics or businesses; criminal records; or personal documents, such as diaries or letters.

To illustrate this method, let's look at an ingenious study that used archival data to study the impact of jet lag on the wins and losses of major league baseball teams. Lawrence Recht and his colleagues (1995) examined the records of 19 North American major league baseball teams, based in the Eastern and Pacific time zones, over three complete seasons (1991-1993). They were interested in studying whether the "home field" advantage (54% wins at home; 46% away) might be due to jet lag, a physiological condition known to affect physical strength and endurance, and which is worse when traveling east than west.

TABLE 1 HOME TEAM WINNING PERCENTAGE DEPENDS ON THE DIRECTION OF VISITOR'S TRANSCONTINENTAL TRAVEL (FROM RECHT ET AL., 1995)

<i>Visitor's direction of travel</i>	<i>No. of games</i>	<i>Games won</i>	<i>Winning %</i>
No travel	712	385	54.1
East—>west	194	109	56.2
West—>east	175	110	62.9
Totals	1,081	604	55.9

To test their hypothesis, the researchers looked at the statistical records for the two games before and after a transcontinental trip (jet lag lasts about one day for each time zone traversed). They found that the overall records of the Eastern and Pacific teams were the same, but the probability of winning home games depended on whether the visiting team had just traveled east. Their archival data, presented in Table 1, show that home teams won a higher percent of their games than usual when the visitor had just traveled east; only western teams "face the double handicap of playing their away games after eastern trips" (Recht, Lew, & Schwartz, 1995, p. 583).

Archival research can fall anywhere on Willems's two-dimensional classification. Archives can record data as diverse as the results of experiments in which strict control of antecedents and subject responses are possible, to material over which researchers have exercised no control at all, like someone's personal papers or the artifacts of an ancient civilization. The baseball study would be classified as low both on control of antecedents and restrictions of subjects' behavior, since the researchers controlled neither the games nor the recorded behaviors of the participants.

2.2.3 Participant Observation

The term "participant observer" was coined by Eduard Lindeman (1924), a University of Chicago sociologist, to refer to "individuals who belong to a group and report on that group to investigators" (Easthope, 1974, p. 90). Today the term still is used, but now it refers to a researcher who interacts with group members for the purpose of studying them.

The extent of participant observers' involvement with their subjects varies from study to study, as do the means they use to gain entry into their subjects' worlds. Researchers may spend extended periods of time with the people they study, sharing many life experiences with them, or the data may be gathered over a relatively short time by means of one or a few intensive interviews. Some investigators have

gained access to groups deceptively, by passing themselves off as regular group members. Others identify themselves as researchers from the outset, hoping that those they plan to study will grant them access to information usually reserved for insiders.

Participant observers try to learn as much as possible about how the people they study understand and give meaning to the events in their lives, by sharing "as intimately as possible" in their lives and activities.
(Denzin, 1970, p. 187)

Researchers using this approach try to understand their subjects' worlds by walking a mile in their shoes, so to speak. Their data may be collected by means of open-ended interviews, questionnaires, examining artifacts and stored information, overhearing conversations, as well as observing ongoing events. Participant observers usually keep detailed field notes. When anthropologists use the method, it is called ethnography, which "literally means 'a portrait of a people'" (Ward, 1996, p. XI).

Participant observers collect facts related to the questions of interest to them, trying to develop explanations and understandings to account for the data they have collected. The result might be an analysis of the stages in the "career" of a mental patient, an explanation of what life is like for a ballet dancer, an attempt to understand the causes of rape by studying how rapists see themselves and their victims, or a description of the lives of teenage boys, as in the following study.

Jay MacLeod (1995), a participant observer, came to the Clarendon Heights public housing project as one of three university students starting a youth enrichment program for 11- to 13-year-old boys. While working with the youth program, MacLeod noticed the failure of the boys to aspire to middle-class jobs. Puzzled by their low aspirations, MacLeod decided to study their older brothers for clues about possible contributing factors. Gradually this interest developed into a plan for a research project that would be the basis for MacLeod's senior honors thesis.

As we have noted, one problem faced by participant observers is how to gain access to the worlds of those they want to study. As Denzin, an expert on the method, noted, participant observers must work "to carve out a role for themselves in the ongoing interaction of which they are a part" (Denzin, 1970, p. 188). This was less of a problem for MacLeod than it might have been. His work with the youth program helped to earn him the respect of the Clarendon Heights community, including its teenagers. Another big step toward entering the world of The Brothers and The Hallway Hangers, the groups MacLeod studied, was gaining the trust of respected members of these groups and sharing in activities valued by group members. MacLeod, a very good athlete, spent hours playing basketball with the boys.

At first, MacLeod observed what went on unobtrusively. Later he told the boys about his research project and asked them to help him out by being interviewed. As he hung out with the boys and spent hours interviewing them, MacLeod reflected on what he was learning, trying, as all participant observers must, to formulate generalizations, which would be tested and retested as the participant observation continued. As MacLeod described this:

If my own experience is at all typical, insight comes from an immersion in the data, a sifting and resifting of the evidence until a pattern makes itself known (MacLeod, 1995, p. 270)

Fieldwork is an organic process that should include a nearly continuous analysis and reorganization of the material into patterns and models that in turn guide the fieldwork in new directions. (MacLeod, 1995, p. 283)

Incredibly, MacLeod's senior paper was published as a book, *Ain't No Makin' It* (1995), which describes the lifestyles of the two groups of teenage boys in the Clarendon Heights project—The Hallway Hangers, a group of predominantly white boys who had given up hope of achievement through legitimate pursuits, and The Brothers, predominantly black youths, who still believed that hard work and

success in school would get them good jobs. The book provides a firsthand glimpse into the worlds of these boys, revealing not only their aspirations but why they saw things as they did.

MacLeod's book also gives his firsthand observations on some of the joys and difficulties of participant observation. Besides the pleasures of coming to know the boys, MacLeod faced some difficult decisions, like whether to violate the law to fit in with The Hallway Hangers. He also found himself unconsciously adopting the style and mannerisms of the boys he was studying:

My speech became rough and punctuated more often with obscenities; I began to carry myself with an air of cocky nonchalance and, I fear, machismo; and I found myself walking in a slow, shuffling gait that admitted a slight swagger. These were not, on the conscious level at least, mere affectations but were rather the unstudied products of my increasing involvement with The Hallway Hangers. (MacLeod, 1995, p. 278)

Losing one's outsider's perspective is one of the pitfalls of participant observation.

Participant observation is a method of collecting observations that is low on Willems's second dimension, the imposition of restrictions on subjects' response alternatives. Participant observers may simply observe happenings as they take part in group activities or they may conduct open-ended intensive interviews. Whatever the particulars, the participant observer begins collecting data uncertain of what will be discovered, and this lack of structure yields both benefits and problems. One benefit is the richness of the descriptive material that the method yields. Participant observation is particularly useful for uncovering the "how" and "why" of behavior, for developing an understanding of sequences of happenings and forms of interaction that are in flux, and for discovery.

A disadvantage of the method is that it is very time-consuming. In addition, the method takes a kind of courage not required of researchers using more structured approaches. Participant observers

must face the constant stress of having to generate insights and revise hypotheses throughout the study.

2.2.4 Phenomenological Research

The phenomenological method shares many features with participant observation, including its low position on Willems's second dimension. A major difference between the methods is what is being studied. Rather than focusing on the "why" of behavior—how people explain what they think and do—the phenomenological researcher looks at the nature of human experience itself.

Researchers using this method systematically collect descriptions of a particular experience, for example, the experience of "really feeling understood," "being angry," or grieving over the loss of a child, from people who have had it. Once gathered, they analyze the descriptions to "come to a grasp of the constituents or common elements that make the experience what it is" (Polkinghorne, 1989, p. 46). The aim of phenomenological research is to enable those who read its results to "come away with the feeling that 'I understand better what it is like for someone to experience that'" (Polkinghorne, 1989, p. 46).

After reading the best psychological writers on human relationships, Ruthellen Josselson (1992), a clinical psychologist, used the phenomenological method to discover how people view their relationships—"What are the dimensions of a relationship as they appear from the inside? What do people mean to others? How do we make use of others in our own development?" (Josselson, 1992, p. xii).

Because the phenomenological method sets out only general guidelines for research, investigators must devise their own particular strategies for generating the kinds of descriptions they need. The success of the method depends upon investigators collecting accurate and full descriptions of experience. Josselson's starting point was to ask her subjects to draw a "relational space," using circles to indicate the important people in their lives— first at age 5, then at 5-year intervals thereafter. Figure 2 shows one such relational space, for Tom at age 5.

Josselson then conducted 3 to 5 hour in-depth interviews with 55 people to help her understand their "lived experience" of important relationships. The people she interviewed ranged in age from 11 to 93 and represented a variety of cultural backgrounds, so that she would have data on the full range of variations of the experience. The interviews focused on the atmosphere of the relationships, important moments, and their changing nature. Josselson's "aim was to offer myself as a nonjudgmental and interested other. ... I did not listen as an expert. I was a student, trying to learn how people make others important to them" (Josselson, 1992, p. xiii).

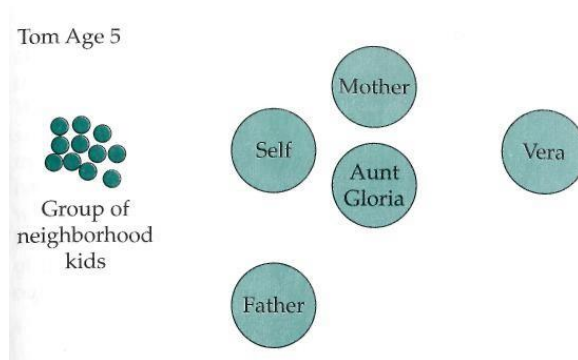


Figure 2 Sample relational map. (From Josselson, 1992.)

Josselson analyzed the descriptions she collected to yield eight basic dimensions that she believes capture the essentials of the experience of relationship with others: The dimensions include the experience of being held by the other, "finding ourselves in the other's eyes," and caring for and being cared for by others. The eight dimensions are discussed in separate chapters of Josselson's book *The Space Between Us*.

Since the ideal of the phenomenological method is to arrive at an accurate and complete picture of experiences, the results of phenomenological research are judged by their clarity. When results of a phenomenological study are published, it is assumed that others will evaluate its analysis against their own experiences. As a further check,

investigators often compare their findings to the descriptions of other researchers, as Josselson did.

2.3 NATURALISTIC RESEARCH DEFINED

One of the reasons why Willems developed his classification scheme was to enable him to provide a clear definition of naturalistic research, the type of research that he does himself. To understand his definition, we first must review how studies are assigned to a particular position in Willems's two-dimensional space. To assign a study requires that we decide both whether it is low, medium, or high on the manipulation of antecedent conditions, and whether it is low, medium, or high on the imposition of units on subjects' responses. Figure 3 gives an overview of Willems's two-dimensional space for describing research activities and locates the studies we have discussed so far in this and the previous chapter. To illustrate the assignment, let's look at Skinner's experiments on operant conditioning and Goodall's observations of chimpanzees in the wild.

Degree of imposition of units on subjects	High--	#1 Low-High Kessler et al. Elbert et al.	#2 High-High Kohler Skinner
	Med--	#3 Med-Med Field experiments (see Chapter 10)	
	Low---	Goodall MacLeod Josselson #4 Low-Low	Franklin & Commissioners #5 High-Low
		Low	Med
		Degree of manipulation of antecedent conditions	

FIGURE 3 Two-dimensional space for describing research studies. (From Willems, 1969.)

B. F. Skinner (1938) wanted to learn how varying environmental events shape particular behaviors of animals in a laboratory setting. In his experiments, a pigeon or rat was placed in the apparatus, an experimental environment that limited the animal's response alternatives and allowed Skinner to deliver food pellets automatically on a predetermined schedule. Skinner recorded only the frequency of highly selected, specifically defined behaviors (e.g., the pigeon's pecking at a stimulus or the rat's bar pressing). The type of design that Skinner used, the single-case experiment, which is discussed later in this chapter and in Chapter 9, is high on Willems's first dimension, the manipulation of antecedents (e.g., schedules of reinforcement), and also high on his second dimension, the imposition of units on the subject's responses. We therefore would place Skinner's research at the high-high position in Figure 3.

Jane Goodall (1986), by contrast, did everything in her power not to manipulate her subjects' behaviors, remaining as unobtrusive and inconspicuous as possible. Instead, she attempted to capture the patterns of chimpanzee life as accurately and completely as possible in her written field notes. Goodall's study is an example of *naturalistic research*.

Willems defines research studies that are low-low in his two-dimensional space (position #4), like Goodall's, as naturalistic. Using Willems's definition, Recht, Lew and Schwartz's baseball study, MacLeod's participant observation study, and Josselson's phenomenological investigation also would be examples of *naturalistic research*.

Research is naturalistic to the extent that it allows subjects' behaviors to unfold without investigator manipulation of antecedent conditions and without restricting the response alternatives of subjects.

Such naturalistic methods generally are recognized as useful in the early stages of research, because they allow researchers to get to

know the subjects they are studying. But there are other advantages of naturalistic research.

In Willems's (1969) opinion, a naturalistic study is the method of choice when researchers want to study people's everyday behavioral achievements, document the distributions of various behaviors in nature, describe and classify behavior, assess the range of behaviors in a person or animal's repertoire, and when ethical considerations do not permit the manipulation of subjects' behaviors. Naturalistic methods also provide important checks on the generality of the results of laboratory research, since most naturalistic studies are done outside the laboratory, in field settings.

2.4 IDIOGRAPHIC VERSUS NOMOTHETIC RESEARCH

Although Willems's classification allows us to think clearly about many differences between research designs, an additional dimension is needed to distinguish between studies focused on the individual case and other types of research. Gordon Allport (1937) introduced the distinction between idiographic and nomothetic research into the language of psychology to meet this need. According to Allport:

Research is *nomothetic* if it focuses on discovering general principles of behavior; it is *idiographic* if it focuses on understanding the behavior of a particular subject.

To illustrate this distinction, let us look at two very different attempts to map the structure of personality. The first, like most research in personality, is nomothetic; the second, done by Allport himself, is idiographic.

A recent report on the achievements of basic behavioral science research listed the discovery of "the fundamental structure of individual differences in personality" among them (Bower & Kilhstrom, 1995, p. 487). This breakthrough in psychologists' understanding of personality was the result of systematic research on personality done by many researchers committed to nomothetic goals.

Over the past decades, psychological researchers have conducted studies aimed at learning the number of dimensions needed to account for individual differences in personality. In such research, large numbers of subjects complete questionnaires about their behaviors, thoughts, and feelings. The results then are analyzed statistically using a complex procedure called *factor analysis* (a correlational technique) to determine the basic traits (or factors) that describe personality. A consensus is emerging from such nomothetic research that five basic dimensions—the Big Five (Goldberg, 1981, 1993) or the five-factor model (McCrae & John, 1992)—are needed to describe the structure of personality: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (Pervin, 1996, p. 43).

Gordon Allport's (1965) analysis of Jenny Gove Masterson's personality is an example of idiographic research. Jenny's son was Allport's roommate in college (Winter, 1996) and Jenny wrote 301 letters to Allport over a span of 12 years. According to Allport, these letters "tell the story of a mother-son relationship and track the course of a life beset by frustration and defeat" (Allport, 1965, p. v). Allport's analysis of the traits that made Jenny the unique person she was is reported in his book *Letters from Jenny*.

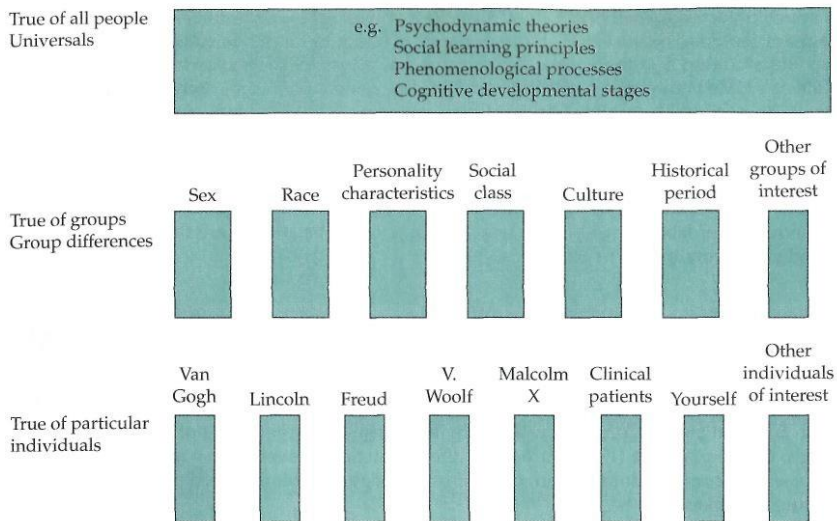


FIGURE 4 Runyan's levels of generality in the study of lives. (From Runyan, 1983.)

Figure 4 shows how William Runyan (1983), a personality psychologist, illustrated the distinction between the nomothetic and idiographic approaches to the study of lives. Although most research in psychology focuses on nomothetic goals, that is, on understanding people in general (level 1 in Figure 4) or categories of people (level 2), personality psychologists, like Runyan, increasingly are recognizing the importance of idiographic research (level 3), which aims at "the in depth understanding of individual lives" (Runyan, 1983, p. 417). In Runyan's view, such understanding is attainable only through idiographic methods, such as

"searching for the individual's reasons for acting in a particular way, through collecting as much information as possible about the individual and looking for idiographic patterns within it, and through organizing information about the case into an intelligible narrative." (Runyan, 1983, p. 418)

In the remainder of this chapter, we present several idiographic approaches to research. The first, the single-case experiment, is a

quantitative method; the other two methods, the case study and psychobiography, are examples of the kind of natural language descriptions that Runyan advocates.

2.4.1 The Single-Case Experiment

Until early in this century, behavioral science research often involved observing single subjects under a variety of circumstances. Mesmer and the commissioners tested individual people in their experiments on animal magnetism. Hermann Ebbinghaus (1885/1964) also used this method in his classic studies of memory. Ebbinghaus studied forgetting by repeatedly testing his own recall of variously constructed lists of nonsense syllables. The research to which we now turn illustrates how modern clinical psychologists use this same design, now called the single-case experiment, to study the impact of treatments on their patients.

George Morelli (1983) evaluated a cognitive-behavioral treatment for the compulsive behavior of an adolescent with this design. The subject was a 13-year-old boy with a history of compulsive tapping in threes. He would tap parts of his body, or other things, using his arms, legs, and head for tapping. He would bounce in threes as he moved around in his environment. These behaviors were not only interfering with his own functioning; they were driving his mother and sister to distraction.

In the first phase of the experiment, the boy's mother was taught cognitive strategies so that she could control her own angry outbursts at her son's behavior. Next she was asked to record his compulsive behavior for 7 days (the baseline), then to begin applying a behavioral technique that she had been taught. Every time the mother saw her son behaving compulsively she was to ask him unemotionally to retrace his steps substituting an appropriate response. Figure 5 shows that this treatment quickly reduced the compulsive behavior, and the gains were maintained at a 9-month follow-up.

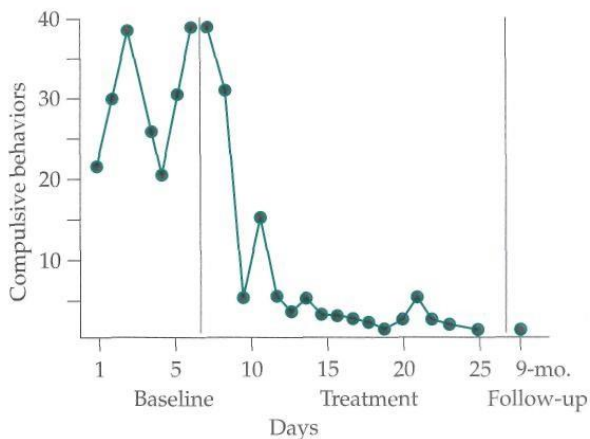


FIGURE 5 Frequency of compulsive behaviors in different phases of Morelli's experiment (Reproduced with permission of author and publisher from: Morelli, G. Adolescent compulsion: a case study involving cognitive-behavioral treatment. *Psychological Reports*, 1983, 53, 519-22.)

Morelli's experiment illustrates how a well-planned single-case experiment, conducted in a controlled setting, can result in a convincing demonstration of a clinical treatment. The single-case design used in this experiment, which is the focus of Chapter 9, also can be used to assess the impact of treatments on groups of subjects (see Chapter 10, Field Research).

2.4.2 The Case Study

The best known of the idiographic methods is the case study, a favorite research method of clinical psychologists and the medical profession. The clinician uses this design to identify and describe psychological problems and to test practical strategies for solving them. But the case study is not restricted to problem behaviors. Many popular personality and developmental theories justify their assertions using material gathered through case studies. Case studies also are used to shed light on rare conditions and exemplary talents, like creativity, leadership, and musical or artistic ability.

D.B. Bromley defines the *case study* as follows:

A case study is a reconstruction and interpretation, based on the best evidence available, of part of the story of a person's life. (Bromley, in Runyan, 1982, p. 443)

The evidence used in case studies can come from many different sources— interviews, observations, test results, archival data, experiments, reports of others, or "any other method capable of producing relevant information" (Runyan, 1982, p. 443). The following case study of a "wild child" found in California answered some questions about language and intelligence but raised even more.

When she was discovered by social workers at age 13, Genie weighed only 59 pounds. She could not straighten her arms or legs and did not know how to chew. But what intrigued psychologists, neurologists, and linguists most was her odd silence; Genie didn't speak. Her only sounds were occasional whimpers. Gradually it was learned that Genie had spent most of her life, from age 20 months to the time of her liberation, restrained, and in almost total isolation. She was the unfortunate child of a tyrannical father who could not stand the noises of children and of a mother who was too frightened of him to oppose his dictates.

Linguists saw in this rare case an opportunity to test theories that argue for a critical period in language development. According to one such theory, unless language is acquired between age 2 and puberty, it will not develop at all. Genie was tested extensively after she was discovered, and was exposed to the best language instruction to help her learn to speak. She eventually learned some words and phrases, discrediting one aspect of critical stage theory.

Despite all her training, however, Genie never achieved the kind of grammatical structure that linguists believe distinguishes human language from that of animals. This finding supported the theory that there is a critical period in language development beyond which normal language cannot be acquired (Pines, 1981).

This case study illustrates the power of the method—the research answered questions about language and about the future possibilities

of a little girl, Genie, that would not have been answered otherwise, as well as illustrating some of its problems. These include: 1) the possibility of alternative hypotheses to explain the same data, and 2) the fact that the validity of the interpretations reached through case study depends on the completeness and accuracy of the data on which they are based. Genie's father restrained and isolated her because he believed that she was intellectually subnormal, suggesting an alternative explanation to the critical period hypothesis to explain her failure to acquire normal language. Or perhaps Genie's education just was not equal to the task. If more complete information were available on Genie's development prior to her enforced isolation and deprivation, we might be able to decide between these possibilities.

In Bromley's view, the ultimate test of a hypothesis is its acceptance "by competent investigators working independently of one another" (Bromley, 1986, p. 37). To increase the likelihood of such acceptance, Bromley advises case study researchers, like attorneys in a court of law, to anticipate opposition to their interpretations and prepare for it. They should ask themselves whether the evidence on which their interpretation is based is solid; whether they have established clear links between the evidence and the conclusions they have drawn from it; whether there are gaps in the argument or evidence; whether alternative interpretations of the data might be raised; and whether predictions based on the interpretation have been substantiated.

2.4.3 Psychobiography and Life Narratives

Psychobiographical methods are a special case of the case study method. Sigmund Freud's *Leonard da Vinci and a Memory of His Childhood* (1910/1957) is identified by experts as the first use of the psychobiographical method in psychology. McAdams defines psychobiography as follows:

Psychobiography is the systematic use of psychological (especially personality) theory to transform a life into a coherent and illuminating story. In psychobiography, the life to be so transformed is usually that of a famous, enigmatic, or paradigmatic figure; and the

storied rendering of the life is communicated to the public in written form. (McAdams, 1988, p. 2)

Unlike the case study, psychobiography focuses on understanding and interpreting the entire life of a given person rather than on understanding only some aspect of it. The goal of psychobiography is to formulate "the central, organizing, animating story of that person's life" (McAdams, 1988, p. 2). Usually the person is someone of historical interest.

Alice Miller (1984), a psychoanalyst, studied Adolph Hitler's childhood to test her theory that human destructiveness is a reaction to being demeaned and humiliated in childhood rather than something innate, the result of what Sigmund Freud called "the death instinct." By studying biographies of Hitler, Miller was able to "imagine and feel what it must have been like for a child to grow up in the Hitler household" (Miller, 1984, p. 144).

Miller believes that when parents simultaneously abuse and demand respect from their offspring, the children must repress the hate engendered by such mistreatment in order to survive. Nevertheless, the history of abuse is "stored up somewhere" in the child, she believes, to appear later in disguised form, in destructive behavior toward others. Miller used Hitler's own writings and speeches, the testimony of witnesses, and the facts of his life to reveal parallels between his mistreatment as a child and his political acts of destruction.

The *life narrative* approach had its roots in the early 20th century, when sociologists used it to solicit the life stories of various marginal members of society.

Like psychobiography, *life narrative research* attempts to illuminate the central organizing themes of a human life, but it uses as its data first person accounts of lives written by people in their own words.

This method declined in popularity after World War II, but interest in the method is reviving among psychologists. In the future, we are likely

to see more research based on people's own accounts of their life experiences and many more methodological discussions of this approach.

2.5 THE VALUE OF DIVERSITY

Donald Polkinghorne (1983), the psychologist we quoted at the beginning of this chapter, studied the etymological roots of the word *method* and discovered that its Greek roots are *meta*, which means "from or after," and *hodos*, meaning "journey." Scientific methods, then, are means of "going-after" or "pursuing" knowledge. Research designs are the roadways on this scientific journey.

Scientists seek answers to many different kinds of questions, and the routes they take reflect this diversity. Our aim in this chapter has been to introduce you to the full range of research methods available to psychologists. We hope that we have been successful in showing that no one design is most useful for answering all the questions posed by modern psychologists.

As the quote with which we began this chapter reminds us, the goal of research is to answer questions as convincingly as possible. This task is not easy. Doing research that leads to clear-cut conclusions about animal and human behavior presents many challenges and pitfalls. Fortunately for us, many innovative researchers, pioneers in research methods, have preceded us on this journey. As you will come to see in the chapters that follow, we can learn much from the tales they tell us of their adventures along the way and from the detailed maps they have left behind.

2.6 KEY TERMS

Willems's two-dimensional descriptive space

Experiments vs. passive observational studies

Naturalistic observation

Exploratory research

Field experiments vs. field studies Natural experiment

"The Two Disciplines of Scientific Psychology"

Longitudinal vs. cross-sectional studies

Surveys

Sample vs. population

Probability sampling

Archival research

Participant observation

Ethnography

Phenomenological research

Naturalistic research

Idiographic vs. nomothetic research

Five-factor model

Single-case experiment

Case study

Psychobiography

Life narrative

2.7 KEY PEOPLE

Jane Goodall

Ronald Kessler

Edwin Willems

Lee Cronbach

Henry Beecher

Kenneth Clark

Robert Thorndike

Thomas Elbert

Lewis Terman

Lawrence Recht

Jay MacLeod

Ruthellen Josselson

B. F. Skinner

Gordon Allport

William Runyan

Hermann Ebbinghaus

George Morelli

Sigmund Freud

Alice Miller

2.8 REVIEW QUESTIONS

1. What research method did Jane Goodall use in observing chimpanzees in the wild? What did she discover?
2. Describe the purpose, general approach, and some of the unexpected findings of Kessler et al.'s survey.
3. What is the first dimension of Willems's two-dimensional classification of research designs? Give examples of at least one study at the high and low ends of the dimension.
4. Where on Willems's first dimension would exploratory research typically fall? Explain your answer.

5. According to Cronbach, what is the well-known virtue of the experimental method?
6. Explain the difference between laboratory and field research.
7. Describe Beecher's research on pain. What important general lesson about methods can be drawn from this research?
8. Explain the steps in Robert Thorndike's study of the professional values of psychologists. What were the results of Thorndike's study?
9. What conclusions about the methods, thoughts, and affiliations of psychologists did Cronbach draw from Thorndike's results?
10. Identify three types of hypotheses that can be tested in correlational research. Give an example of a study testing each type of hypothesis.
11. Explain the difference between a longitudinal and cross-sectional study. Give an example of each type of study.
12. What is the second dimension of Willems's two-dimensional classification of research designs? Give examples of studies at different positions (high and low) on this dimension.
13. Identify the distinguishing characteristics of the types of research listed below. For each, give an example of the research and explain where it would be classified on Willems's two dimensions.
 - surveys
 - archival research
 - participant observation research
 - phenomenological research
14. How does Willems define naturalistic research using his two-dimensional classification scheme?
15. According to Willems, for what kinds of research questions and situations is naturalistic research the method of choice?
16. Explain the difference between idiographic and nomothetic research. Give an example of each type of study.

17. Distinguish between a single-case experiment and a case study. Give an example of each of these idiographic approaches to research
18. How do psychobiography and life-narratives differ from standard case studies? Give an example of psychobiography.