Faulty Reasoning about Units of Analysis: The Ecological Fallacy and Reductionism

At this point, it's appropriate to introduce two types of faulty reasoning that you should be aware of: the ecological fallacy and reductionism. Each represents a potential pitfall regarding units of analysis, either of which can occur in doing research and drawing conclusions from the results.

The Ecological Fallacy

In this context, "ecological" refers to groups or sets or systems: something larger than individuals. **The ecological fallacy** is the assumption that something learned about an ecological unit says something about the individuals making up that unit. Let's consider a hypothetical illustration of this fallacy.

Suppose we are interested in learning about the nature of electoral support received by a female political candidate in a recent citywide election. Let's assume that we have the vote tally for each precinct so that we can tell which precincts gave her the greatest support and which the least. Assume also that we have census data describing some characteristics of these precincts. Our analysis of such data might show that precincts with relatively young voters gave the female candidate a greater proportion of their votes than did precincts with older voters. We might be tempted to conclude from these findings that young voters are more likely to vote for female candidates than are older voters—in other words, that age affects support for women in politics. In reaching such a conclusion, we run the risk of committing the ecological fallacy because it may have been the older voters in those "young" precincts who voted for the woman. Our problem is that we have examined *precincts* as our units of analysis but wish to draw conclusions about *voters*.

The same problem would arise if we discovered that crime rates were higher in cities having large African-American populations than in those with few African Americans. We would not know if the crimes were actually committed by African Americans. Or if we found suicide rates higher in Protestant countries than in Catholic ones, we still could not know for sure that more Protestants than Catholics committed suicide.

In spite of these hazards, social scientists very often have little choice but to address a particular research question through an ecological analysis. Perhaps the most appropriate data are simply not available. For example, the precinct vote tallies and the precinct characteristics mentioned in our initial example might be easy to obtain, but we may not have the resources to conduct a postelection survey of individual voters. In such cases, we may reach a tentative conclusion, recognizing and noting the risk of an ecological fallacy.

While you should be careful not to commit the ecological fallacy, don't let these warnings lead you into committing what we might call the individualistic fallacy. Some people who approach social research for the first time have trouble reconciling general patterns of attitudes and actions with individual exceptions. As we discussed in Chapter 2, generalizations and probabilistic statements are not invalidated by individual exceptions. Your knowing a rich Democrat, for example, doesn't deny the fact that most rich people vote Republican—as a general pattern. Similarly, if you know someone who has gotten rich without any formal education, that doesn't deny the general pattern of higher education relating to higher income.

The ecological fallacy deals with something else altogether—confusing units of analysis in such a way that we draw conclusions about individuals based solely on the observation of groups. Although the patterns observed between variables at the level of groups may be genuine, the danger lies in reasoning from the observed attributes of groups to the attributes of the individuals who made up those groups when we have not actually observed individuals.

Reductionism

A second type of potentially faulty reasoning related to units of analysis is reductionism. Reductionism means seeing and explaining complex phenomena in terms of a single, narrow concept or set of concepts. Thus, we "reduce" what in reality is complex to a simple explanation.

For instance, scientists from different disciplines tend to look at different types of answers and ignore the others. Sociologists tend to consider only sociological variables (such as values, norms, and roles), economists only economic variables (such as supply and demand, marginal value), and psychologists only psychological variables (such as personality types, traumas). Explaining all or most human behavior in terms of economic factors is called economic reductionism; explaining all or most human behavior in terms of psychological factors is called psychological reductionism; and so forth. Notice how this issue relates to the discussion of theoretical paradigms in Chapter 2.

In another example, suppose we ask what caused the American Revolution. Was it a shared commitment to the value of individual liberty? The economic plight of the colonies in relation to Britain? The megalomania of the founding fathers? As soon as we inquire about *the* single cause, we run the risk of reductionism.

Reductionism of any type tends to suggest that particular units of analysis or variables are more relevant than others. If we were to regard shared values as the cause of the American Revolution, our unit of analysis would be the individual colonist. An economist, though, might choose the 13 colonies as units of analysis and examine the economic organizations and conditions of each. A psychologist might choose individual leaders as the units of analysis for purposes of examining their personalities.

Like the ecological fallacy, reductionism can occur when we use inappropriate units of analysis. The appropriate unit of analysis for a given research question, however, is not always clear. Social scientists, especially across disciplinary boundaries, often debate this issue.

The Time Dimension

So far in this chapter, we have regarded research design as a process for deciding what aspects we shall observe, of whom, and for what purpose. Now we must consider a set of time-related options that cuts across each of these earlier considerations. We can choose to make observations more or less at one time or over a long period.

Time plays many roles in the design and execution of research, quite aside from the time it takes to do research. Chapter 3 noted that the time sequence of events and situations is critical to determining causation (a point we'll return to in Part 4). Time also affects the generalizability of research findings. Do the descriptions and explanations resulting from a particular study accurately represent the situation of ten years ago, ten years from now, or only the present? Researchers have two principal options available to deal with the issue of time in the design of their research: cross-sectional studies and longitudinal studies.

Cross-Sectional Studies

A **cross-sectional study** involves observations of a sample, or cross section, of a population or phenomenon that are made at one point in time. Exploratory and descriptive studies are often cross-sectional. A single U.S. Census, for instance, is a study aimed at describing the U.S. population at a given time.

Many explanatory studies are also cross-sectional. A researcher conducting a large-scale national survey to examine the sources of racial and religious prejudice would, in all likelihood, be dealing with a single time frame—taking a snapshot, so to speak, of the sources of prejudice at a particular point in history.

Explanatory cross-sectional studies have an inherent problem. Although their conclusions are based on observations made at only one time, typically they aim at understanding causal processes that occur over time. This problem is somewhat akin to that of determining the speed of a moving object on the basis of a high-speed, still photograph that freezes the movement of the object.

Yanjie Bian, for example, conducted a survey of workers in Tianjin, China, for the purpose of studying stratification in contemporary, urban Chinese society. In undertaking the survey in 1988, however, he was conscious of the important changes

brought about by a series of national campaigns, such as the Great Proletarian Cultural Revolution, dating from the Chinese Revolution of 1949 (which brought the Chinese Communists into power) and continuing into the present.

> These campaigns altered political atmospheres and affected people's work and nonwork activities. Because of these campaigns, it is difficult to draw conclusions from a cross-sectional social survey, such as the one presented in this book, about general patterns of Chinese workplaces and their effects on workers. Such conclusions may be limited to one period of time and are subject to further tests based on data collected at other times.
>
> *(1994:19)*

The problem of generalizations about social life from a "snapshot" is one this book repeatedly addresses. One solution is suggested by Bian's final comment—about data collected "at other times": Social research often involves revisiting phenomena and building on the results of earlier research.

Longitudinal Studies

In contrast to cross-sectional studies, a **longitudinal study** is designed to permit observations of the same phenomena over an extended period. For example, a researcher can participate in and observe the activities of a UFO cult from its inception to its demise. Other longitudinal studies use records or artifacts to study changes over time. In analyses of trends in newspaper editorials or Supreme Court decisions over time, for example, the studies are longitudinal whether the researcher's actual observations and analyses are made at one time or over the course of the actual events under study.

Many field research projects, involving direct observation and perhaps in-depth interviews, are naturally longitudinal. For example, when Ramona Asher and Gary Fine (1991) studied the life experiences of the wives of alcoholic men, they were in a position to examine the evolution of the women's troubled marital relationships over time, sometimes even including the reactions of the subjects to the research itself.

In a classic study, *When Prophecy Fails* (1956), Leon Festinger, Henry Reicker, and Stanley Schachter were specifically interested in learning what happened to a flying saucer cult when the cult's predictions of an alien encounter failed to come true. Would the cult members close down the group, or would they become all the more committed to their beliefs? A longitudinal study was required to provide an answer. (They redoubled their efforts to get new members.)

Longitudinal studies can be more difficult for quantitative studies such as large-scale surveys. Nonetheless, they are often the best way to study changes over time. There are three special types of longitudinal studies that you should know about: trend studies, cohort studies, and panel studies.

Trend Studies

A trend study is a type of longitudinal study that examines changes within a population over time. A simple example is a comparison of U.S. Censuses over a period of decades, showing shifts in the makeup of the national population. A similar use of archival data was made by Michael Carpini and Scott Keeter (1991), who wanted to know whether contemporary U.S. citizens were better or more poorly informed about politics than were citizens of an earlier generation. To find out, they compared the results of several Gallup Polls conducted during the 1940s and 1950s with a 1989 survey that asked several of the same questions tapping political knowledge.

Overall, the analysis suggested that contemporary citizens were slightly better informed than were earlier generations. In 1989, 74 percent of the sample could name the vice president of the United States, compared with 67 percent in 1952. Substantially higher percentages could explain presidential vetoes and congressional overrides of vetoes than could people in 1947. On the other hand, more of the 1947 sample could identify their U.S. representative (38 percent) than could the 1989 sample (29 percent).

An in-depth analysis, however, indicates that the slight increase in political knowledge resulted from the fact that the people in the 1989 sample were more highly educated than were those from earlier samples. When educational levels were taken into account, the researchers concluded that political knowledge had actually declined within specific educational groups.

TABLE 4-1
Age and Political Liberalism

Survey Dates	1972 to 1974	1977 to 1980	1982 to 1984	1987 to 1989
Age of Cohort	20–24	25–29	30–34	35–39
Percent who would let the communist speak	72%	68%	73%	73%

Cohort Studies

In a **cohort study,** a researcher examines specific subpopulations, or cohorts, as they change over time. Typically, a cohort is an age group, such as those people born during the 1950s, but it can also be some other time grouping, such as people born during the Vietnam War, people who got married in 1994, and so forth. An example of a cohort study would be a series of national surveys, conducted perhaps every 20 years, to study the attitudes of the cohort born during World War II toward U.S. involvement in global affairs. A sample of people 15–20 years of age might be surveyed in 1960, another sample of those 35–40 years of age in 1980, and another sample of those 55–60 years of age in 2000. Although the specific set of people studied in each survey would differ, each sample would represent the cohort born between 1940 and 1945.

James Davis (1992) turned to a cohort analysis in an attempt to understand shifting political orientations during the 1970s and 1980s in the United States. Overall, he found a liberal trend in issues such as race, gender, religion, politics, crime, and free speech. But did this trend represent people in general getting a bit more liberal, or did it merely reflect more liberal younger generations replacing the conservative older ones?

To answer this question, Davis examined national surveys conducted in four time periods, five years apart. In each survey, he grouped the respondents into age groups, also five years apart. This strategy allowed him to compare different age groups at any given point in time as well as follow the political development of each age group over time.

One of the questions he examined was whether a person who admitted to being a communist should be allowed to speak in the respondents' communities. Consistently, the younger respondents in each period of time were more willing to let the communist speak than were the older ones. Among those aged 20–40 in the first set of the survey, for example, 72 percent took this liberal position, contrasted with 27 percent among respondents 80 and older. What Davis found when he examined the youngest cohort over time is shown in Table 4-1.

This pattern of a slight, conservative shift in the 1970s, followed by a liberal rebound in the 1980s, typifies the several cohorts Davis analyzed (J. Davis 1992:269).

Panel Studies

Though similar to trend and cohort studies, a **panel study** examines the same set of people each time. For example, we could interview the same sample of voters every month during an election campaign, asking for whom they intended to vote. Though such a study would allow us to analyze overall trends in voter preferences for different candidates, it would also show the precise patterns of persistence and change in intentions. For example, a trend study that showed that Candidates A and B each had exactly half of the voters on September 1 and on October 1 could indicate that none of the

electorate had changed voting plans, that all of the voters had switched allegiance to the other candidate, or something in between. A panel study would eliminate this confusion by showing what kinds of voters switched from A to B and what kinds switched from B to A, as well as other facts.

Joseph Veroff, Shirley Hatchett, and Elizabeth Douvan (1992) wanted to learn about marital adjustment among newlyweds, looking for differences between white and African-American couples. To get subjects for study, they selected a sample of couples who applied for marriage licenses in Wayne County, Michigan, April through June 1986.

Concerned about the possible impact their research might have on the couples' marital adjustment, the researchers divided their sample in half at random: an experimental group and a control group (concepts we'll explore further in Chapter 8). Couples in the former group were intensively interviewed over a four-year period, whereas the latter group was contacted only briefly each year.

By studying the same couples over time, the researchers could follow the specific problems that arose and the way the couples dealt with them. As a by-product of their research, they found that those studied the most intensely seemed to achieve a somewhat better marital adjustment. The researchers felt that the interviews may have forced couples to discuss matters they may have otherwise buried.

Comparing the Three Types of Longitudinal Studies

To reinforce the distinctions among trend, cohort, and panel studies, let's contrast the three study designs in terms of the same variable: political party affiliation. A trend study might look at shifts in U.S. religious affiliations over time, as the Gallup Poll does on a regular basis. A cohort study might follow shifts in religious affiliations among "the Depression generation," specifically, say, people who were between 20 and 30 in 1932. We could study a sample of people 30–40 years old in 1942, a new sample of people aged 40–50 in 1952, and so forth. A panel study could start with a sample of the whole population or of some special subset and study those specific individuals over time. Notice that only the panel study would give a full picture of the shifts among the various religions as well as into or out of the "none" category. Cohort and trend studies would uncover only net changes.

Longitudinal studies in general have an obvious advantage over cross-sectional ones in providing information describing processes over time. But this advantage often comes at a heavy cost in both time and money, especially in a large-scale survey. Observations may have to be made at the time events are occurring, and the method of observation may require many research workers.

Panel studies, which offer the most comprehensive data on changes over time, face a special problem: panel attrition. Some of the respondents studied in the first wave of the survey may not participate in later waves, whether by choice or circumstance. The danger is that those who drop out of the study may not be typical, thereby distorting the results of the study. Thus, when Carol S. Aneshensel and colleagues compared Latina and non-Latina adolescents' sexual behavior by means of a panel study, they looked for and found differences in characteristics of survey dropouts among Latinas born in the United States and those born in Mexico. These differences needed to be taken into account to avoid misleading conclusions about differences between Latinas and non-Latinas (Aneshensel et al. 1989). For a further comparison of the three types of longitudinal studies, see the box entitled "The Time Dimension and Aging."

Approximating Longitudinal Studies

Longitudinal studies do not always provide a feasible or practical means of studying processes that take place over time. Fortunately, researchers often can draw approximate conclusions about such processes even when only cross-sectional data are available. Here are some ways to do that.

Sometimes, cross-sectional data imply processes over time on the basis of simple logic. For example, in the study of student drug use conducted at the University of Hawaii that I mentioned in Chapter 2, students were asked to report whether they had ever tried each of several illegal drugs. The study found that some students had tried both marijuana and LSD, some had tried only one, and others had tried neither. Because these data were collected at one time, and because some students presumably would experiment with drugs later on, it would appear that such a study could not tell whether students were more likely to try marijuana or LSD first.

A closer examination of the data showed, however, that although some students reported having tried marijuana but not LSD, there were no students in the study who had tried only LSD. From this finding, the researchers inferred—as common sense suggested—that marijuana use preceded LSD use. If the process of drug experimentation occurred

The Time Dimension and Aging

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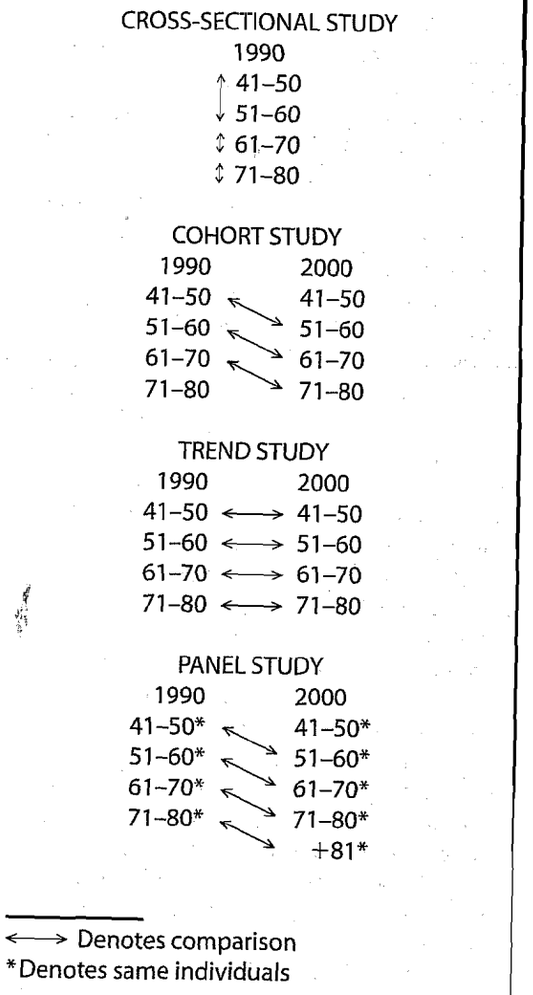
One way to identify the type of time dimension used in a study is to imagine a number of different research projects on growing older in the American society. If we studied a sample of individuals in 1990 and compared the different age groups, the design would be termed *cross-sectional*. If we drew another sample of individuals using the same study instrument in the year 2000 and compared the new data with the 1990 data, the design would be termed *trend*.

Suppose we wished to study only those individuals who were 51–60 in the year 2000 and compare them with the 1990 sample of 41–50-year old persons (the 41–50 age cohort); this study design would be termed *cohort*. The comparison could be made for the 51–60 and 61–70 age cohorts as well. Now, if we desired to do a *panel* study on growing older in America, we would draw a sample in the year 1990 and, using the same sampled individuals in the year 2000, do the study again. Remember, there would be fewer people in the year 2000 study because all the 41–50-year-old people in 1990 are 51–60 and there would be no 41–50-year-old individuals in the year 2000 study. Furthermore, some of the sampled individuals in 1990 would no longer be alive in the year 2000.



in the opposite time order, then a study at a given time should have found some students who had tried LSD but not marijuana, and it should have found no students who had tried only marijuana.

Researchers can also make logical inferences whenever the time order of variables is clear. If we discover in a cross-sectional study of college students that those educated in private high schools received better college grades than did those educated in public high schools, we would conclude that the type of high school attended affected college grades, not the other way around. Thus, even though our observations were made at only one time, we would feel justified in drawing conclusions about processes that took place across time.

Very often, age differences discovered in a cross-sectional study form the basis for inferring processes across time. Suppose you are interested in the pattern of worsening health over the course of the typical life cycle. You might pursue this subject by studying the results of annual checkups in a large hospital. You could group health records according to the ages of those examined and rate each age group in terms of several health conditions—sight, hearing, blood pressure, and so forth. By reading across the age-group ratings for each health condition, you would have something approximating the health history of individuals. Thus, you might conclude that the average person develops vision problems before hearing problems. You would need to be cautious in this assumption, however, because the differences might reflect society-wide trends. Perhaps improved hearing examinations instituted in the schools had affected only the young people in your study.

Asking people to recall their pasts is another common way of approximating observations over time. Researchers use that method when they ask people where they were born or when they graduated from high school or whom they voted for in 1996. Qualitative researchers often conduct in-depth "life history" interviews. For example, C. Lynn Carr (1998) used this technique in a study of "tomboyism." Her respondents, aged 25 to 40, were asked to reconstruct aspects of their lives from childhood on, including experiences of identifying themselves as tomboys.

The danger in this technique is evident. Sometimes people have faulty memories; sometimes they lie. When people are asked in postelection polls whom they voted for, the results inevitably show more people voting for the winner than actually did so on election day. As part of a series of in-depth interviews, such a report can be validated in the context of other reported details; however, results based on a single question in a survey must be regarded with caution.

This discussion of the ways that time figures into social research suggest several questions you should confront in your own research projects. In designing any study, be sure to examine both the explicit and the implicit assumptions you're making about time. Are you interested in describing or explaining some process that occurs over time, or are you interested simply in what exists now? If you want to describe a process occurring over time, will you be able to make observations at different points in the process, or will you have to approximate such observations by drawing logical inferences from what you can observe now? If you opt for a longitudinal design, which method best serves your research purposes?

Examples of Research Strategies

As the preceding discussions have implied, social scientific research follows many paths. The following short excerpts further illustrate this point. As you read each excerpt, take note of both the content of each study and the method used to study the chosen topic. Does the study seem to be exploring, describing, or explaining (or some combination of these)? What are the sources of data in each study? Can you identify the unit of analysis? Is the dimension of time relevant? If so, how will it be handled?

- This case study of unobtrusive mobilizing by Southern California Rape Crisis Center uses archival, observational, and interview data to explore how a feminist organization worked to change police, schools, prosecutors, and some state and national organizations from 1974 to 1994. (Schmitt and Martin 1999:364)
- Using life history narratives, the present study investigates processes of agency and consciousness among 14 women who identified themselves as tomboys. (Carr 1998:528)
- By drawing on interviews with activists in the former Estonian Soviet Socialist Republic, we specify the conditions by which accommodative and oppositional subcultures exist and are successfully transformed into social movements. (Johnston and Snow 1998:473)
- This paper presents the results of an ethnographic study of an AIDS service organization located in a small city. It is based on a combination of participant observation, interviews with participants, and review of organizational records. (Kilburn 1998:89)
- Using interviews obtained during fieldwork in Palestine in 1992, 1993, and 1994, and employing historical and archival records, I argue that Palestinian feminist discourses were shaped and influenced by the sociopolitical context in which Palestinian women acted and with which they interacted. (Abdulhadi 1998:649)
- This article reports on women's experiences of breastfeeding in public as revealed through in-depth interviews with 51 women. (Stearns 1999:308)
- Using interview and observational field data, I demonstrate how a system of temporary employment in a participative workplace both exploited and shaped entry-level workers' aspirations and occupational goals. (V. Smith 1998:411)
- I collected data [on White Separatist Rhetoric] from several media of public discourse, including periodicals, books, pamphlets, transcripts from radio and television talk shows, and newspaper and magazine accounts. (Berbrier 1998:435)
- In the analysis that follows, racial and gender inequality in employment and retirement will be analyzed, using a national sample of persons who began receiving Social Security Old Age benefits in 1980–81. (Hogan and Perrucci 1998:528)
- Drawing from interviews with female crack dealers, this paper explores the techniques they use to avoid arrest. (Jacobs and Miller 1998:550)

How To Design a Research Project

You've just seen some of the options available to social researchers in designing projects. Now let's pull the parts together by looking at the actual process of designing a research project. Assume you were to undertake a research study. Where would you start? Then, where would you go?

Although research design occurs at the beginning of a research project, it involves all the steps of the subsequent project. This discussion, then, provides both guidance on how to start a research project and an overview of the topics that follow in later chapters of this book.

Figure 4-2 presents a schematic view of the social science research process. I present this view reluctantly, because it may suggest more of a step-by-step order to research than actual practice bears out. Nonetheless, this idealized overview of the process provides a context for the specific details of particular components of social research. Essentially, it is another and more detailed picture of the scientific process presented in Chapter 2.

At the top of the diagram are interest, idea, and theory, the possible beginning points for a line of research. The letters (A, B, X, Y, and so forth) represent variables or concepts such as prejudice or alienation. Thus, you might have a general interest in finding out what causes some people to be more prejudiced than others, or you might want to know some of the consequences of alienation. Alternatively, your inquiry might begin with a specific idea about the way things are. For example, you might have the idea that working in low-level service jobs (say, at a fast-food outlet) causes alienation. The question marks in the diagram indicate that you aren't sure things are the way you suspect they are—that's why you're doing the research. Notice that a theory is represented as a set of complex relationships among several variables.

you'll reach them. Will it be appropriate to select a sample? If so, how will you do that? If there is any possibility that your research will affect those you study, how will you insure that the research does not harm them?

Measurement

What are the key variables in your study? How will you define and measure them? Do your definitions and measurement methods duplicate or differ from those of previous research on this topic? If you have already developed your measurement device (a questionnaire, for example) or will be using something previously developed by others, it might be appropriate to include a copy in an appendix to your proposal.

Data-Collection Methods

How will you actually collect the data for your study? Will you conduct an experiment or a survey? Will you undertake field research or will you focus on the reanalysis of statistics already created by others? Perhaps you will use more than one method.

Analysis

Indicate the kind of analysis you plan to conduct. Spell out the purpose and logic of your analysis. Are you interested in precise description? Do you intend to explain why things are the way they are? Do you plan to account for variations in some quality: for example, why some students are more liberal than others? What possible explanatory variables will your analysis consider, and how will you know if you've explained variations adequately?

Schedule

It is often appropriate to provide a schedule for the various stages of research. Even if you don't do this for the proposal, do it for yourself. Unless you have a timeline for accomplishing the several stages of research and keeping in touch with how you're doing, you may end up in trouble.

Budget

When you ask someone to cover the costs of your research, you need to provide a budget that specifies where the money will go. Large, expensive projects include budgetary categories such as personnel, equipment, supplies, telephones, and postage. Even for a project you will pay for yourself, it's a good idea to spend some time anticipating expenses: office supplies, photocopying, computer disks, telephone calls, transportation, and so on.

As you can see, if you were interested in conducting a social science research project, it would be a good idea to prepare a research proposal for your own purposes, even if you weren't required to do so by your instructor or a funding agency. If you're going to invest your time and energy in such a project, you should do what you can to insure a return on that investment.

Now that you've had a broad overview of social research, let's move on to the remaining chapters in this book and learn exactly how to design and execute each specific step. If you've found a research topic that really interests you, you'll want to keep it in mind as you see how you might go about studying it.

MAIN POINTS

- The principal purposes of social research include exploration, description, and explanation. Research studies often combine more than one purpose.
- Exploration is the attempt to develop an initial, rough understanding of some phenomenon.
- Description is the precise reporting and/or measurement of the characteristics of some population or phenomenon under study.
- Explanation is the discovery and reporting of relationships among different aspects of the phenomenon under study. Whereas descriptive studies answer the question "What's so?" explanatory ones tend to answer the question "Why?"

- Units of analysis are the people or things whose characteristics social researchers observe, describe, and explain. Typically, the unit of analysis in social research is the individual person, but it may also be a social group, a formal organization, a social artifact, or some other phenomenon such as lifestyles or social interactions.
- The ecological fallacy involves conclusions drawn from the analysis of the attributes of groups (e.g., neighborhoods) that are then assumed to apply to individuals (e.g., specific residents of different neighborhoods).
- Reductionism is the attempt to understand a complex phenomenon in terms of a narrow set of concepts, such as attempting to explain the American Revolution solely in terms of economics (or political idealism or psychology).
- Research into processes that occur over time presents social challenges that can be addressed through cross-sectional studies or longitudinal studies.
- Cross-sectional studies are based on observations made at one time. Although such studies are limited by this characteristic, researchers can sometimes make inferences about processes that occur over time.
- In longitudinal studies, observations are made at many times. Such observations may be made of samples drawn from general populations (trend studies), samples drawn from more specific subpopulations (cohort studies), or the same sample of people each time (panel studies).
- Research design starts with an initial interest, idea, or theoretical expectation and proceeds through a series of interrelated steps to narrow the focus of the study so that concepts, methods, and procedures are well defined. A good research plan accounts for all these steps in advance.
- At the outset, a researcher specifies the meaning of the concepts or variables to be studied (conceptualization), chooses a research method or methods (e.g., experiments versus surveys), and specifies the population to be studied and, if applicable, how it will be sampled.
- The researcher operationalizes the concepts to be studied by stating precisely how variables in the study will be measured. Research then proceeds through observation, processing the data, analysis, and application, such as reporting the results and assessing their implications.
- A research proposal provides a preview of why a study will be undertaken and how it will be conducted. A research project is often required to get permission or necessary resources. Even when not required, a proposal is a useful device for planning.

KEY TERMS

units of analysis
social artifact
ecological fallacy
reductionism
cross-sectional study
longitudinal study
trend study
cohort study
panel study

REVIEW QUESTIONS AND EXERCISES

1. Using InfoTrac or the library, select a research report that illustrates exploration, description, or explanation. Identify which of these three purposes the report illustrates and briefly justify your judgment in that regard.
2. Here are some examples of real research topics. For each one, name the unit of analysis. (The answers are at the end of this chapter.)
   a. Women watch TV more than men because they are likely to work fewer hours outside the home than men. . . . Black people watch an average of approximately three-quarters of an hour more television per day than white people. (Hughes 1980:290)
   b. Of the 130 incorporated U.S. cities with more than 100,000 inhabitants in 1960, 126 had at least two short-term nonproprietary general hospitals accredited by the American Hospital Association. (Turk 1980:317)
   c. The early TM [transcendental meditation] organizations were small and informal. The Los Angeles group, begun in June 1959, met at a member's house where, incidentally, Maharishi was living. (Johnston 1980:337)

d. However, it appears that the nursing staffs exercise strong influence over . . . a decision to change the nursing care system. . . . Conversely, among those decisions dominated by the administration and the medical staffs . . . (Comstock 1980:77)

e. Though 667,000 out of 2 million farmers in the United States are women, women historically have not been viewed as farmers, but rather, as the farmer's wife. (Votaw 1979:8)

f. The analysis of community opposition to group homes for the mentally handicapped . . . indicates that deteriorating neighborhoods are most likely to organize in opposition, but that upper-middle class neighborhoods are most likely to enjoy private access to local officials. (Graham and Hogan 1990:513)

g. Some analysts during the 1960s predicted that the rise of economic ambition and political militancy among blacks would foster discontent with the "otherworldly" black mainline churches. (Ellison and Sherkat 1990:551)

h. This analysis explores whether propositions and empirical findings of contemporary theories of organizations directly apply to both private product producing organizations (PPOs) and public human service organizations (PSOs). (Schiflett and Zey 1990:569)

i. This paper examines variations in job title structures across work roles. Analyzing 3,173 job titles in the California civil service system in 1985, we investigate how and why lines of work vary in the proliferation of job categories that differentiate ranks, functions, or particular organizational locations. (Strang and Baron 1990:479)

3. Look through an academic research journal until you find examples of at least three different units of analysis. Identify each and present quotations from the journal to justify your conclusions.

4. Make up a research example—different from those discussed in the text—that illustrates a researcher falling into the trap of the ecological fallacy. Then modify the example to avoid this trap.

5. Drop in at the Russell Sage Foundation (http://www.epn.org/sage.html) and look at their publications. Select one that illustrates a cross-sectional, trend, cohort, or panel study design. Justify your choice.

ADDITIONAL READINGS

Bart, Pauline, and Linda Frankel. 1986. *The Student Sociologist's Handbook*. Morristown, NJ: General Learning Press. A handy little reference book to help you get started on a research project. Written from the standpoint of a student term paper, this volume offers a particularly good guide to the periodical literature of the social sciences available in a good library.

Casley, D. J., and D. A. Lury. 1987. *Data Collection in Developing Countries*. Oxford: Clarendon Press. This book discusses the special problems of research in the developing world.

Cooper, Harris M. 1989. *Integrating Research: A Guide for Literature Reviews*. Newbury Park, CA: Sage. The author leads you through each step in the literature review process.

Hunt, Morton. 1985. *Profiles of Social Research: The Scientific Study of Human Interactions*. New York: Basic Books. An engaging and informative series of project biographies: James Coleman's study of segregated schools is presented, as well as several other major projects that illustrate the elements of social research in practice.

Iversen, Gudmund R. 1991. *Contextual Analysis*. Newbury Park, CA: Sage. Contextual analysis examines the impact of socioenvironmental factors on individual behavior. Durkheim's study of suicide offers a good example of this, identifying social contexts that affect the likelihood of self-destruction.

Maxwell, Joseph A. 1996. *Qualitative Research Design: An Interactive Approach*. Newbury Park, CA: Sage. Maxwell covers many of the same topics that this chapter does but with attention devoted specifically to qualitative research projects.

Menard, Scott. 1991. *Longitudinal Research*. Newbury Park, CA: Sage. Beginning by explaining why researchers conduct longitudinal research, the author goes on to detail a variety of study designs as well as suggestions for the analysis of longitudinal data.

Miller, Delbert. 1991. *Handbook of Research Design and Social Measurement*. Newbury Park, CA: Sage. A useful reference for introducing or reviewing numerous issues involved in design and measurement. In addition, the book contains a wealth of practical information relating to foundations, journals, and professional associations.

ANSWERS TO REVIEW QUESTIONS AND EXERCISES, ITEM 2

a. Men and women, black and white people (individuals)

b. Incorporated U.S. cities (groups)

c. Transcendental meditation organizations (groups)

d. Nursing staffs (groups)

e. Farmers (individuals)

f. Neighborhoods (groups)

g. Blacks (individuals)

h. Service and production organizations (formal organizations)

i. Job titles (artifacts)

SOCIOLOGY WEB SITE

See the Wadsworth Sociology Resource Center, Virtual Society, for additional links, Internet exercises by chapter, quizzes by chapter, and Microcase-related materials:

http://www.sociology.wadsworth.com

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SEARCH WORD SUMMARY

Go to the Wadsworth Sociology Resource Center, Virtual Society, to find a list of search words for each chapter. Using the search words, go to InfoTrac College Edition, an online library of over 900 journals where you can do online research and find readings related to your studies. To aid in your search and to gain useful tips, see the Student Guide to InfoTrac College Edition on the Virtual Society Web site:

http://www.sociology.wadsworth.com