

Scientific Method for Sociology

An area of inquiry is a **scientific discipline** if its investigators use the **scientific method**, which is a systematic approach to researching questions and problems through objective and accurate **observation, collection and analysis of data, direct experimentation, and replication** (repeating) of these procedures. Scientists affirm the importance of gathering information carefully, remaining unbiased when evaluating information, observing phenomena, conducting experiments, and accurately recording procedures and results. They are also skeptical about their results, so they repeat their work and have their findings confirmed by other scientists.

Is sociological research scientific? Yes! By definition, **sociological research** is the scientific means of acquiring information about various aspects of society and social behavior. Sociologists use the scientific method. Like other scientists, they stress the accurate and unbiased collection and analysis of social data, use systematic observation, conduct experiments, and exhibit skepticism.

Basic Sociological Research Concepts

An investigator begins a research study after evolving ideas from a specific **theory**, which is an integrated set of statements for explaining various phenomena. Because a theory is too general to test, the investigator devises a **hypothesis**, or testable prediction, from the theory, and tests this instead. The results of the research study either disprove or do not disprove the hypothesis. If disproved, the investigator cannot make predictions based

on the hypothesis, and must question the accuracy of the theory. If not disproved, the scientist can make predictions based on the hypothesis.

A goal of sociological research is to discover the similarities, differences, patterns, and trends of a given **population**. Members of a population who participate in a study are **subjects** or **respondents**. When the characteristics of a **sample** of the population are representative of the characteristics of the entire population, scientists can apply, or **generalize**, their findings to the entire population. The best and most representative sample is a **random sample**, in which each member of a population has an equal chance of being chosen as a subject.

In **quantitative research**, information collected from respondents (for example, a respondent's college ranking) is converted into numbers (for example, a junior may equal three and a senior four). In **qualitative research**, information collected from respondents takes the form of verbal descriptions or direct observations of events. Although verbal descriptions and observations are useful, many scientists prefer quantitative data for purposes of analysis.

To analyze data, scientists use **statistics**, which is a collection of mathematical procedures for describing and drawing inferences from the data. Two types of statistics are most common: **inferential**, used for making predictions about the population, and **descriptive**, used for describing the characteristics of the population and respondents. Scientists use both types of statistics to draw general conclusions about the population being studied and the sample.

A scientist who uses a questionnaire or test in a study is interested in the test's **validity**, which is its capacity to measure what it purports to measure. He or she is also interested in its **reliability**, or capacity to provide consistent results when administered on different occasions.

Sociological Research: Designs, Methods

Sociologists use many different designs and methods to study society and social behavior. Most sociological research involves **ethnography**, or “field work” designed to depict the characteristics of a population as fully as possible.

Three popular social research **designs** (models) are

- **Cross-sectional**, in which scientists study a number of individuals of different ages who have the same trait or characteristic of interest at a single time
- **Longitudinal**, in which scientists study the same individuals or society repeatedly over a specified period of time
- **Cross-sequential**, in which scientists test individuals in a cross-sectional sample more than once over a specified period of time

Six of the most popular sociological research **methods** (procedures) are the *case study*, *survey*, *observational*, *correlational*, *experimental*, and *cross-cultural* methods, as well as working with information already available.

Case study research

In **case study research**, an investigator studies an individual or small group of individuals with an unusual condition or situation. Case studies are

typically clinical in scope. The investigator (often a clinical sociologist) sometimes uses self-report measures to acquire quantifiable data on the subject. A comprehensive case study, including a long-term follow-up, can last months or years.

On the positive side, case studies obtain useful information about individuals and small groups. On the negative side, they tend to apply only to individuals with similar characteristics rather than to the general population. The high likelihood of the investigator's biases affecting subjects' responses limits the generalizability of this method.

Survey research

Survey research involves interviewing or administering **questionnaires**, or written surveys, to large numbers of people. The investigator analyzes the data obtained from surveys to learn about similarities, differences, and trends. He or she then makes predictions about the population being studied.

As with most research methods, survey research brings both advantages and disadvantages. Advantages include obtaining information from a large number of respondents, conducting personal interviews at a time convenient for respondents, and acquiring data as inexpensively as possible. "Mail-in" surveys have the added advantage of ensuring anonymity and thus prompting respondents to answer questions truthfully.

Disadvantages of survey research include **volunteer bias**, **interviewer bias**, and **distortion**. **Volunteer bias** occurs when a sample of volunteers is not representative of the general population. Subjects who are willing to

talk about certain topics may answer surveys differently than those who are not willing to talk. **Interviewer bias** occurs when an interviewer's expectations or insignificant gestures (for example, frowning or smiling) inadvertently influence a subject's responses one way or the other. **Distortion** occurs when a subject does not respond to questions honestly.

Observational research

Because distortion can be a serious limitation of surveys, **observational research** involves directly observing subjects' reactions, either in a laboratory (called **laboratory observation**) or in a natural setting (called **naturalistic observation**). Observational research reduces the possibility that subjects will not give totally honest accounts of the experiences, not take the study seriously, fail to remember, or feel embarrassed.

Observational research has limitations, however. Subject bias is common, because volunteer subjects may not be representative of the general public. Individuals who agree to observation and monitoring may function differently than those who do not. They may also function differently in a laboratory setting than they do in other settings.

Correlational research

A sociologist may also conduct **correlational research**. A **correlation** is a relationship between two **variables** (or “factors that change”). These factors can be characteristics, attitudes, behaviors, or events. Correlational research attempts to determine if a relationship exists between the two variables, and the degree of that relationship.

A social researcher can use case studies, surveys, interviews, and observational research to discover correlations. Correlations are either positive (to +1.0), negative (to -1.0), or nonexistent (0.0). In a positive correlation, the values of the variables increase or decrease ("co-vary") together. In a negative correlation, one variable increases as the other decreases. In a nonexistent correlation, no relationship exists between the variables.

People commonly confuse correlation with causation. Correlational data do not indicate *cause-and-effect* relationships. When a correlation exists, changes in the value of one variable reflect changes in the value of the other. The correlation does not imply that one variable causes the other, only that both variables somehow relate to one another. To study the effects that variables have on each other, an investigator must conduct an experiment.

Experimental research

Experimental research attempts to determine *how* and *why* something happens. Experimental research tests the way in which an **independent variable** (the factor that the scientist manipulates) affects a **dependent variable** (the factor that the scientist observes).

A number of factors can affect the outcome of any type of experimental research. One is finding samples that are random and representative of the population being studied. Another is **experimenter bias**, in which the researcher's expectations about what should or should not happen in the study sway the results. Still another is controlling for **extraneous variables**, such as room temperature or noise level, that may interfere with

the results of the experiment. Only when the experimenter carefully controls for extraneous variables can she or he draw valid conclusions about the effects of specific variables on other variables.

Cross-cultural research

Sensitivity to others' norms, folkways, values, mores, attitudes, customs, and practices necessitates knowledge of other societies and cultures. Sociologists may conduct **cross-cultural research**, or research designed to reveal variations across different groups of people. Most cross-cultural research involves survey, direct observation, and **participant observation** methods of research.

Participant observation requires that an "observer" become a member of his or her subjects' community. An advantage of this method of research is the opportunity it provides to study what actually occurs within a community, and then consider that information within the political, economic, social, and religious systems of that community. Cross-cultural research demonstrates that Western cultural standards do not necessarily apply to other societies. What may be "normal" or acceptable for one group may be "abnormal" or unacceptable for another.

Research with existing data, or secondary analysis

Some sociologists conduct research by using data that other social scientists have already collected. The use of publicly accessible information is known as **secondary analysis**, and is most common in situations in which collecting new data is impractical or unnecessary. Sociologists may obtain statistical data for analysis from businesses, academic institutions, and

governmental agencies, to name only a few sources. Or they may use historical or library information to generate their hypotheses.

Ethics in Sociological Research

Ethics are self-regulatory guidelines for making decisions and defining professions. By establishing ethical codes, professional organizations maintain the integrity of the profession, define the expected conduct of members, and protect the welfare of subjects and clients. Moreover, ethical codes give professionals direction when confronting **ethical dilemmas**, or confusing situations. A case in point is a scientist's decision whether to intentionally deceive subjects or inform them about the true risks or goals of a controversial but much-needed experiment. Many organizations, such as the American Sociological Association and the American Psychological Association, establish ethical principles and guidelines. The vast majority of today's social scientists abide by their respective organizations' ethical principles.

A researcher must remain mindful of her or his ethical responsibilities to participants. A researcher's primary duty is to protect the welfare of the subjects. For example, a researcher whose study requires extensive questioning of volunteers' personal information should screen the subjects beforehand to assure that the questioning will not distress them. A researcher should also inform subjects about their expected roles in the study, the potential risks of participating, and their freedom to withdraw from the study at any time without consequences. Agreeing to participate in a study based on disclosure of this type of information constitutes **informed consent**. After the study is finished, the researcher should provide subjects

with complete details about the study. Providing details at the conclusion of an experiment is called **debriefing**.

Many critics believe that no experiment justifies the intentional use of **deception**, or concealing the purpose and procedures of a study from participants. Not only does deception carry the risk of psychologically harming subjects, it reduces the general public's support for research. Proponents, however, view deception as necessary when prior knowledge of a study would sway a subject's responses and invalidate the results. If subjects learn that a study measures attitudes of racial discrimination, they may intentionally try to avoid appearing prejudiced.

Even the most ethical and cautious researcher cannot anticipate every risk associated with participating in a study. But by carefully screening subjects, informing subjects of their rights, giving them as much information as possible before the study, avoiding deception, and debriefing following the study, the researcher can at least minimize the risks of harm to the subjects.