**Focus Questions**

What research methods do social scientists use?

What steps do researchers use to conduct experiments?

What is a sample survey?

How do researchers conduct interviews?

Why do researchers use the method of observation?

# Research Methods

Social scientists have a range of methods they can use for the third step in the inquiry process—gathering data. The research method chosen will depend on the question or problem and the field of study. Anthropologists, psychologists and sociologists often prefer different approaches.

## Case Studies

A **case study** is the observation of an individual, a situation or a group over a period of time. A psychologist may work closely with one individual in order to understand and help that particular person. A sociologist may observe and interview the students of one class. An anthropologist may study people in one culture.

Why study one example or case? By studying one situation in depth, a lot of detail can be unearthed, and hypotheses about similar situations can be developed. Researchers may then use these hypotheses to study and understand other individuals, social groups or cultures. For example, if

**Figure 1–3**
An anthropologist might conduct a case study of child rearing in Mexico, using it as a basis for comparison with child rearing in other countries. A psychologist might conduct a case study of a parent and child to better understand their relationship. A sociologist might conduct a case study to find out more about the role of parenthood.

you were to study the case of one student whose marks seem to be falling as a result of having a car, you might be able to apply what you have learned to other students who are not doing well in school.

## Experiments

The essence of an experiment is to determine how one factor is related to another—for example, could one factor be caused by the other? What happens if one factor is changed? How does this change appear to affect other factors?

In the natural sciences such as physics, biology and chemistry, experiments are widely conducted. However, in the social sciences, this method is used with great care due to the ethical questions involved in experimenting with human beings. For example, it might be possible to measure the impact of car use on grades by encouraging one group of students

**ethical**—pertaining to the accepted principles that govern the conduct of a profession or practice

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## Conducting an Experiment

### Here's How

1. **The question:** Like other forms of inquiry, experiments begin with a question or a problem.
2. **A testable hypothesis:** The purpose of the experiment is to determine whether there is evidence to support the hypothesis.
3. **Independent variable:** This is the factor to be changed in the experiment. For example, if the experiment is to determine the impact of car use on school grades, the independent variable might be the number of hours a week that students have access to a car.
4. **Dependent variable:** This is the factor affected by the change. In the car-use inquiry, the dependent variable would be the grades.
5. **The control group:** In order to measure the impact of the independent variable, experiments will often have a control group—that is, a group that is monitored as a standard for comparison with the experiment. For example, to study the impact of car ownership on grades, the researcher must compare the grades of car owners with grades from a control group of students who do not own cars.
6. **Control of other factors:** The researcher must ensure that other factors are not causing the observed effects. For example, if all the car drivers in the experiment also belonged to a gym team and were committed to long hours of practice, there would be no proof that car use caused the falling grades.
7. **Observation:** The experiment requires some method of observing, measuring and recording the change that takes place. For example, in the car-use inquiry, the researcher would have to measure the hours of car use—perhaps the time of day and the number of hours the car was available.
8. **Conclusion:** This statement indicates whether the hypothesis is supported by the evidence provided in the experiment.

to spend every evening over the next few months driving around, while a control group spent several hours each evening doing homework. Would this be ethical? Probably not—it's likely that the grades of the students in the experimental group would fall, and the students would suffer the consequences. It would be ethical, however, to record how many hours car-owning students do homework per week, compare this number with students who do not have access to a car, and then observe their grades. In this case, the social scientist would not be intruding or harming the students.

## Sample Surveys

**Sample surveys** are used to obtain information about the thoughts or behaviour of a large group of people. They are called "sample" surveys because researchers ask questions of a fairly limited number of individuals who represent a larger group; then they draw conclusions about that larger group. For example, a researcher might investigate the impact of car use on grades in the entire school by surveying several teens from different classes. Sample surveys are often used by sociologists because they provide a general idea of trends and responses. The tool used to gather information is usually a questionnaire—a series of formulated questions aimed at collecting information for research or statistical study. Many questionnaires use a multiple-choice format, which allows researchers to collate the results easily.

**polling companies**—organizations that conduct and assess opinion surveys

How many people must be sampled to have a reliable result? The sample should be large enough to include a range of characteristics that might affect the result. For example, a car-use survey should include students with different levels of academic achievement. In political surveys, when polling companies ask 1000 people whom they will vote for, they must make sure that they question a cross-section—a range of people representing different aspects of the population with respect to age, sex, occupation, region, culture and other characteristics. From this representative sample, they will draw conclusions about Canadians in general. One drawback is that sample surveys do not allow people to explain their thoughts or opinions beyond responding to the questions themselves.

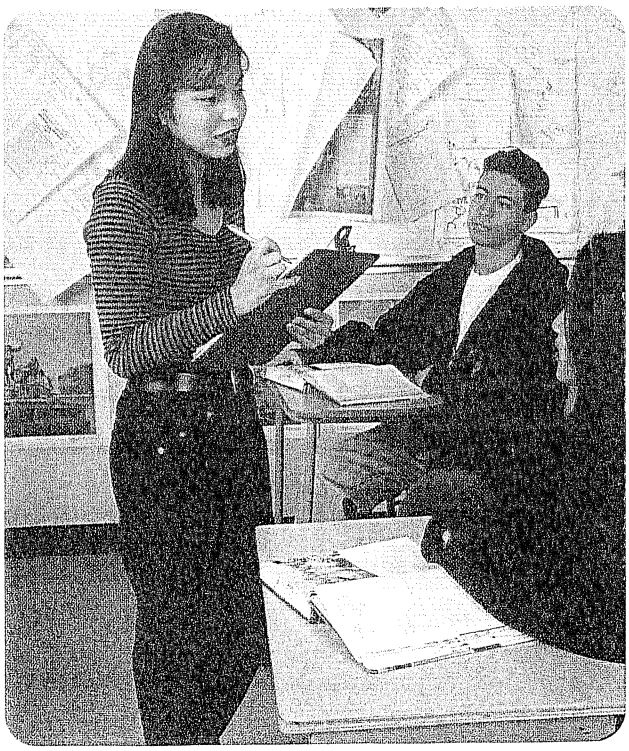

**Figure 1–4**
Using a questionnaire, a student conducts a survey of classmates, recording answers as they are given.

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## Conducting a Sample Survey

### Here's How

1. **The problem:** First focus on your main question.

2. **The hypothesis:** As in all social science inquiries, develop a hypothesis to guide your research.

3. **The questionnaire:** Prepare a questionnaire that will allow you to collect enough evidence to test the hypothesis. Use a multiple-choice format if possible.

   **DO:**
   Phrase questions so that there is no doubt about the answer.
   Use questions that will help you quantify your data.
   1. Do you own your own car?
      a) Yes b) No
   2. Do you have access to a car owned by someone else?
      a) Yes b) No
   3. How many hours a week do you have access to a car?
      a) Never b) 5 hours or less
      c) 6–10 hours d) More than 10 hours

   **DON'T:**
   Ask questions that can be interpreted in different ways.
   Ask questions that are not needed to test the hypothesis.
   1. Do you own your own car or have access to a car owned by someone else?
   2. Do you enjoy driving?

4. **The sample group:** Decide the size of the sample you need to get a meaningful result and who will complete your questionnaire. The people you actually select to respond to your questionnaire are called your sample group. If your respondents are chosen by chance, you have what is called a random sample. For example, to get a random sample of students in your school, you could put everyone's name in a hat and pull out a certain number of names.

5. **Analyzing data:** Using a blank questionnaire, record the number of responses to each question. Convert the raw scores to percentages:

   **Size of sample: 40**
   1. Do you own your own car?
      a) Yes **10/40 = 25%**
      b) No **30/40 = 75%**
   2. Do you have access to a car owned by someone else?
      a) Yes **20/40 = 50%**
      b) No **10/40 = 25%**

## Interviews

Interviews are used when a researcher requires detailed information from a few people and is looking for explanations or descriptions of thought and behaviour. An interview takes the form of a dialogue between the interviewer and the subject. Generally, a number of questions are prepared before the interview; the interviewer may stay with these questions or allow the interview to develop according to the discussion that follows. Interviews are a useful tool for anthropologists, psychologists, and sociologists alike.

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## Conducting an Interview

### Here's How

**1. Preparing for the interview**

- Write down your purpose for conducting the interview. This purpose is often the central problem of your inquiry. Example: Does car use affect student grades?
- Write down specific things you want to find out. For instance, you might want to know about accessibility to a car, rules imposed by parents and reasons for using the car. Now convert these areas of interest into a list of questions you will ask. Begin with straightforward questions; move on to questions that may require more thought or longer answers.
- Contact the person you wish to interview. Explain the purpose of the interview, and arrange a time and place for your meeting. Remember that you are asking the person to do you a favour, so be courteous.

**2. Conducting the interview**

- Arrive on time. If possible, bring a portable tape recorder, and ask permission to use it. Check that it is working properly before you begin. Check the spelling of the person's name. Have your interview question sheet with you; leave space between questions to jot down notes.
- Ask your questions, but be prepared to ask additional questions that come to mind as the interview proceeds.
- After completing the interview, check that you have asked all the questions you prepared.
- Thank the respondent for helping you with your research.

**3. Analyzing the results**

- If you are doing more than one interview, analyze the first one before conducting the second. Decide whether you learned information from the first interview that will help you ask better questions. If so, reword or change your questions.
- In writing up your findings, explain the purpose of your research. Discuss the findings in a logical way and include quotations from each interview. Longer segments of the interview may be put into an appendix at the end of the report. Sum up the main findings of the interview in a conclusion. Indicate further research that needs to be done.

## Observation

In everyday life, we use observation to learn about how people respond in certain situations. Observation techniques are also important in the social sciences—in psychology, sociology and anthropology. Methods that rely on observation have the advantage of helping researchers learn about people in their normal surroundings, or "in the field," as social scientists say.

There are several methods of observation. **Unstructured observation** involves studying people without a predetermined idea of what to look for. A researcher may sit in a cafeteria or on a park bench and note what people do and say, open to anything that might occur. Unstructured observation allows for fresh insights and ideas, and provides new hypotheses

for further research. **Structured observation** involves planning beforehand what will be observed and noted, and keeping a list of things to look for. For example, a researcher studying the effect of car use on grades might observe a class and look for signs of fatigue or restlessness in students known to be car owners. The observer might also use content analysis, which is a particular kind of structured observation. In content analysis, a researcher will examine an area of interest—perhaps written materials, television shows or segments of a conversation or debate. For instance, a researcher may watch television commercials for cars to see how they appeal directly to young people. Usually a checklist is used to help the observer make notes and draw conclusions. You will learn more about content analysis in Chapter 17, Culture, Communication and Computers.

**Participant observation** is a technique used mainly by anthropologists. The researcher not only observes the group but also participates in the group's activities—for short periods of time in one's own society or for longer periods in other cultures. Anthropologists may live with people in another culture or country for as long as one or two years.

**Figure 1–5**
If you were to observe this situation as a social scientist, which form of observation would you choose? Why?

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## Conducting Observation Research

### Here's How

1. **Choose** the method that best suits your purpose: unstructured observation, structured observation or participant observation.
2. **Describe** the physical setting of your observation, including the surroundings and any objects that are being used (e.g., tools, equipment or furniture).
3. **Observe** the behaviour of the people involved and how they interact with each other. Note what they do and say.
4. **Analyze** what you have observed. What do your observations reveal about the scene you have studied? What further questions do they raise?

## Activities

### Understand Ideas

1. Create a chart showing the research methods used by social scientists. The five research methods will be your column headings across the top of your chart. Below each heading, write in point form two important characteristics that describe each method.

2. a) What steps are involved in conducting an experiment?
   b) Why is it important to have a control group?
   c) What type of problem or question is best suited to this research method?

3. How would you prepare to conduct an interview?

### Think and Evaluate

4. Which research method would you use to test each of the following hypotheses? Give reasons for your choices.
   - Teenagers have more leisure time than their parents.
   - Teachers ask more questions of the students in the front of the class than at the back.
   - Over 75 percent of students you meet in the school corridors will return a smile.
   - All school facilities are wheelchair accessible.
   - Students in the cafeteria tend to sit with people of the same culture.
   - Students who sit in the front row of the class get better grades than those in the back.
   - Girls in secondary school get better grades than boys.

### Apply Your Learning

5. Develop a hypothesis for each of the following questions. Suggest a research method that would be most appropriate for testing your hypothesis in each case. Why did you choose those particular methods?
   - Will students work harder for marks or for free time?
   - Are women better drivers than men?
   - Does more education bring higher income?
   - Are older or younger students more willing to follow school rules?
   - Do Canadian television shows reflect the cultural diversity of Canadian society?
   - Do most seniors in your community live independently, with their families or in retirement homes?
   - Do parents allow daughters less freedom than they give their sons?
   - Is there a relationship between school grades and having a part-time job?

### Research and Communicate

6. a) Select one of the topics listed in Activity 5 above and conduct your research based on the method you have chosen.
   b) Present your findings to the class. Be sure to describe the method you have used as well as your findings.

**Focus Questions**

What are the three steps in analyzing data?

Why is analyzing data so important?

# Analyzing Data

The research methods we have discussed will all yield data that takes a variety of forms depending on the method chosen, for example, numbers and statistics from a survey questionnaire, a description of a structured observation or notes from an interview. The data, in itself, will not be useful unless it is organized and analyzed. It must be changed into a format that helps test the hypothesis and answer the question being asked—it must be turned into evidence.

## Analyzing Data: How Much Do Students Spend?

Follow the procedure below to put your social science skills into action.

**Question:** How much money does a high-school student spend per day, on average?

**Hypothesis:** Most students spend more than $4.00 per day.

**Research method:** Use a sample survey questionnaire. Conduct a random sample survey of students in the school. Make sure your sample includes at least 15 people. Ask the following question: "On average, how much money do you spend in a day? Consider daily expenditures (such as bus fares) and exception expenditures (such as going shopping for clothes or going to a movie on the weekend)."

**Data analysis:** Start by listing your findings. Your findings might look like this:

| | |
|---|---|
| Fatima | $0.00 |
| Robin | $4.00 |
| Vasily | $70.00 |
| Abiba | $4.50 |
| Tara | $5.00 |
| Jeanne | $3.00 |
| Rasheed | $14.00 |
| Kirsten | $20.00 |
| Bill | $5.50 |
| Lana | $20.00 |
| Liam | $3.00 |
| Mara | $14.00 |
| Dee | $4.50 |
| Tommy | $3.00 |
| Zachary | $80.00 |

Now organize your data to make sense of your findings. One way is to determine the median, which is derived from ordering the statistics from lowest to highest. The median is the mid-point, or the point at which half the numbers are above and half are below. In the example above, $5.00 appears to be the median:

$0.00
$3.00
$3.00
$3.00
$4.00
$4.50
$4.50
**$5.00**
$5.50
$14.00
$14.00
$20.00
$20.00
$70.00
$80.00

Another way to organize your data is to determine the mean average. To do so, you take the total amount spent and divide it by the number of people surveyed. In the example above, the total is $250.50. When the total is divided by 15, the result is $16.70 per person.

Which of these methods of organization do you think would be best for your purposes? Choose one and draw a conclusion based on your survey. Compare your findings with others in the class.

## Steps to Analyze the Data

Analyzing data is a process that involves three steps:

1. **Data should be separated into two categories: relevant and irrelevant.** Some of the data that has been collected may not have a bearing on the question or the hypothesis. This data can be discarded as irrelevant. The only data that is retained and used is whatever will address the question and support or negate the hypothesis.

**random**—having no specific pattern, purpose or objective

2. **Data should be organized in a way that makes it clear.** Unorganized information can become a random collection of facts and figures. Data can be organized in several ways: divide the data into information that either supports or negates the hypothesis; convert numbers into percentages; or put the data into a chart or a graph to determine whether it reveals any trends over time.

3. **Data should be analyzed in terms of how it supports, or fails to support, the hypothesis.** This is a crucial step in research. Once the information has been organized, the researcher has to determine the extent to which it supports the hypothesis. This process involves dividing the data into three categories: information that supports the hypothesis, information that provides evidence against the hypothesis and information that neither supports nor negates the hypothesis.

**Focus Questions**

What are the four categories of conclusions?

How can you verify that a social science study has value?

# Drawing Conclusions

In the social sciences, a conclusion is an answer to the question being asked. It is also a statement of the degree to which the hypothesis is supported. Based on the hypothesis, conclusions can be divided into four categories:

1. The evidence supports the hypothesis.
2. There is some evidence in support of the hypothesis.
3. The evidence does not support the hypothesis.
4. The evidence supports an alternative hypothesis.

**Figure 1–6**
Data can help you draw conclusions only if it is organized and analyzed.

Which of these conclusions best fits the findings of your survey on student spending?

Social scientists should not be overly cautious when considering warranted or reasonable conclusions. On the other hand, they must never go beyond what is supported by the evidence. There are three general tests to check that a social science study has value: objectivity, relevance and validity. To be objective, the findings should not be coloured by the personal opinions of the researcher. To be relevant, the findings must relate directly to the problem. To be valid, all results must be accurate and reliable.