

## OBSERVATION METHODS

### What you will learn in this chapter

- To distinguish between scientific observation and casual observation.
- To discuss what can and cannot be observed.
- To understand when an observation study is the appropriate research design.
- To discuss the characteristics of observation research.
- To give examples of nonverbal behavior that can be observed.
- To discuss the various situations in which direct observation studies may take place.
- To define *response latency*.
- To discuss scientifically contrived observation.
- To define *physical-trace evidence*.
- To define *content analysis*.
- To explain the purposes of content analysis.
- To describe the various types of mechanical observation.
- To discuss the techniques for measuring physiological reactions.

In conversation one day Sherlock Holmes asked Watson how many steps there were to the Baker Street apartment. Watson responded that he did not know. Holmes replied, "Ah, Watson, you see but you do not *observe*." Although we are constantly looking around in our daily lives, like Dr. Watson we often do not observe in a scientific sense. Holmes, on the other hand, trained himself to systematically observe the environment in order to see what others overlooked.

This chapter discusses how the observation method of data gathering is used in business research. ■

## WHEN IS OBSERVATION SCIENTIFIC?

Observation becomes a tool for scientific inquiry when it

- serves a formulated research purpose,
- is planned systematically,
- is recorded systematically and related to general propositions rather than being presented as reflecting a set of interesting curiosities, and
- is subjected to checks or controls on validity and reliability.<sup>1</sup>

### Scientific observation

Systematic process of recording behavioral patterns of people, objects, and occurrences as they are witnessed.

**Scientific observation** is the systematic process of recording the behavioral patterns of people, objects, and occurrences as they are witnessed. No questioning of or communicating with people occurs. The researcher utilizing the observation method of data collection witnesses and records information as events occur or compiles evidence from records of past events. (Although investigation of such secondary data uses observation—see Chapter 8—it is not extensively discussed in this chapter.)

## WHAT CAN BE OBSERVED?

A wide variety of information about the behavior of people and objects can be observed. As Exhibit 11.1 indicates, seven kinds of phenomena can be observed: physical actions, such as work patterns or television viewing; verbal behavior, such as office conversations; expressive behavior, such as tone of voice or facial expressions; spatial relations and locations, such as physical distance between workers or traffic patterns; temporal patterns, such as the amount of time spent shopping or time required to perform a work task; physical objects, such as finished goods inventory; and verbal and pictorial records, such as the content of memoranda.

Although the observation method may be used to describe a wide variety of behaviors, cognitive phenomena, such as attitudes, motivations, expectations, intentions, and preferences, cannot be observed. Another limitation is that the observation period is generally of short duration. Observing behavior patterns over a period of several days or several weeks generally is either too costly or too difficult.

### TO THE POINT

Where observation is concerned, success favors only the prepared investigator.

LOUIS PASTEUR

EXHIBIT 11.1

### WHAT CAN BE OBSERVED?

Phenomenon	Example
Human behavior or action	Workers' movement patterns in a factory
Verbal behavior	Statements made by airline travelers waiting in line
Expressive behavior	Facial expressions, tone of voice, and other forms of body language
Spatial relations	Proximity of middle managers' offices to the president's office
Temporal patterns	How long workers take to perform a task
Physical objects	How much paper office workers recycle
Verbal and pictorial records	How many illustrations appear in a training booklet

## THE NATURE OF OBSERVATION STUDIES

Business researchers can observe people, objects, events, or other phenomena by assigning the task to human observers or by using machines designed for specific observation tasks. Human observers are commonly used when the situation or behavior to be recorded is not easily predictable in advance of the research. Mechanical observation, such as by traffic counters on a factory floor, can be very accurate when the situation or behavior to be recorded is routine, repetitive, or programmatic.

Human or mechanical observation methods may be unobtrusive in that communication with the subjects is not generally necessary. Rather than ask customers how much time they spend shopping in a specific supermarket, the supermarket manager might observe and record shopping time by timing the interval between a shopper's entering and leaving the store. The unobtrusive or nonreactive nature of the observation method often generates data without subjects' knowledge. An observation situation in which the observer's presence is known to the subject is **visible observation**. A situation in which the subject is unaware that observation is taking place is **hidden observation**. Hidden, unobtrusive observation minimizes respondent error. Furthermore, asking subjects to participate in the research is not required when those subjects are unaware that they are being observed. However, hidden observation raises an ethical issue concerning respondents' privacy.

The major advantage of observation studies over surveys, which obtain self-reported data from respondents, is that the data obtained by observation

### *visible observation*

Situation in which the observer's presence is known to the subject.

### *hidden observation*

Situation in which the subject is unaware that observation is taking place.



*A wide variety of information about human behavior, such as work activity, can be unobtrusively observed. What kinds of nonverbal behaviors might a researcher record in this situation?*

are not subject to distortions, inaccuracies, or other response biases due to memory error, social desirability, and so on. The data are recorded when the actual behavior takes place.

## OBSERVATION OF HUMAN BEHAVIOR

Surveys emphasize verbal responses, while observation studies emphasize and allow for the systematic recording of nonverbal behavior. A French researcher, who regularly visited his wife's office in the early evening, observed a typical pattern: The married men and single women were working overtime, and nearly all of the single men and married women had gone home. This led to the hypothesis that marriage helps men in their careers and hinders women, because the husband receives family support for job advancement while the married woman does not. This informal observation led to more rigorous quantitative studies.

Toy manufacturers use the observation technique because children often cannot verbally express their reactions to a product. By observing children at play with a proposed toy, doll, or game, business researchers may be able to identify the elements of a potentially successful product. Researchers might observe play with toys to answer the following questions: "How long does the child's attention stay with the toy? Does the child put the toy down after 2 minutes or 20 minutes? Are the child's peers equally interested in the product?"

Behavioral scientists have recognized that *nonverbal behavior* can be a communication process by which meanings are exchanged between individuals. Head nods, smiles, raised eyebrows, and other facial expressions or body movements have been recognized as communication symbols. Observation of nonverbal communication has considerable promise for the business researcher. For example, with regard to customer–salesperson interactions, it has been hypothesized that in low-importance transactions where potential customers are plentiful and easily replaced (e.g., a shoe store), salespersons may show definite nonverbal signs of higher status than the customer. When customers are scarce, as in "big ticket" situations (e.g., real estate sales), the opposite should be true, and a salesperson might show many nonverbal indicators of deference. Observation of the nonverbal communication gestures in Exhibit 11.2 could test this hypothesis.

Of course, verbal behavior is not ignored, and in certain cases verbal responses are very important in observation studies.

## SUPPLEMENTARY EVIDENCE

The results of observation studies may amplify the results of other forms of research by providing *complementary* evidence concerning individuals' "true" feelings. Role-playing sessions and focus group interviews are often conducted behind one-way mirrors, so that researchers can observe as well as listen to what is occurring. This allows for the interpretation of such nonverbal behavior as facial expressions or head nods to supplement information from interviews.

For example, in one focus group session concerning hand lotion, researchers observed that the women's hands were *above* the table while they

Behavior	BETWEEN PEOPLE OF EQUAL STATUS		BETWEEN PEOPLE OF UNEQUAL STATUS		BETWEEN MEN AND WOMEN	
	Intimate	Nonintimate	Used by Superior	Used by Subordinate	Used by Men	Used by Women
Posture	Relaxed	Tense (less relaxed)	Relaxed	Tense	Relaxed	Tense
Personal space	Closeness	Distance	Closeness (optional)	Distance	Closeness	Distance
Touching	Touch	Don't touch	Touch (optional)	Don't touch	Touch	Don't touch
Eye gaze	Establish	Avoid	Stare, ignore	Avert eyes, watch	Stare, ignore	Avert eyes
Demeanor	Informal	Circumspect	Informal	Circumspect	Informal	Circumspect
Emotional expression	Show	Hide	Hide	Show	Hide	Show
Facial expression	Smile	Don't smile	Don't smile	Smile	Don't smile	Smile

casually waited for the session to begin. Seconds after the women were told that the group session was to be about hand lotion, "all hands had been placed under the table or out of sight and the women's faces became tense."<sup>3</sup> This observation, along with the group discussion, revealed the women's anger, guilt, and shame about the condition of their hands. Although the women felt they were expected to have soft and pretty hands, housework requires washing dishes, cleaning floors, and other work that is hard on the hands.

When individual or group behavior is videotaped, observation of nonverbal communication can also add to the researchers' knowledge of the situation.

## DIRECT OBSERVATION

### direct observation

A straightforward attempt to observe and record what naturally occurs; the investigator does not create an artificial situation.

**Direct observation** can produce a detailed record of events or what people actually do. The observer plays a passive role; that is, there is no attempt to control or manipulate a situation. The observer merely *records* what occurs.

Many types of data can be obtained more accurately by direct observation than by questioning. For example, records of traffic counts and/or observations of the direction of traffic flows within a factory can be useful when designing workstation layouts. A time-and-motion observation study of workers on a loading dock might attempt to break down tasks into component motions (e.g., grasping, picking up, setting down) so that the efficiency of the work process can be cataloged and evaluated. The observer might use a stopwatch to time each of these discrete motions in the work process. Most respondents, if directly questioned, would be unable to say accurately how much time they spent at each task. With the observation method, determination of the time for each task is not difficult.



*Domain Stores, a chain of 23 furniture stores headquartered in Norwood, Massachusetts, hired Grid II, a business research firm, to videotape consumers in one of its stores. Analysis of the videotapes revealed that people shop for furniture in twos. Of the 1,034 customers who entered the store, 954 came in pairs. In addition, facial expressions and other nonverbal behavior indicated many male customers were visibly ill at ease amid fluffed pillows and floral duvets. "The typical customer needs to be in the store for at least 9 minutes to feel comfortable enough to buy," says the company's CEO. "But if the spouse or boyfriend pulls her away too soon, we lose out on the sale." As a result of the observation research, the company revamped its 23 stores with entertainment centers where sports fans can watch live events via cable.<sup>4</sup>*

Researchers using the direct observation method compile data by recording events as they occur. An observation form is often used to help keep the observations consistent and to ensure that all relevant information is recorded. A respondent is not required to recall (perhaps inaccurately) an event after it has occurred. The recording of the observation is instantaneous.

In many cases direct observation is the most straightforward form of data collection (or the only form possible). The produce manager at a Jewel Food Store may periodically gather competitive price information at the Safeway and IGA stores in the neighborhood. In other situations observation is the most economical technique. In a common type of observation study, researchers for a shopping center observe the license numbers on cars in the parking lot. This is an inexpensive means of determining where customers live.

Certain data may be obtained more quickly or easily by direct observation. For example, in a quality-of-life survey, respondents were asked a series of questions that were compiled into an index of well-being. Direct observation was also used by the interviewers because the researchers wanted to investigate whether weather conditions influenced people's answers. The researchers quickly and easily observed and recorded outside weather conditions on the day of the interviews, as well as the temperature and humidity in the building where the interviews were conducted.<sup>5</sup>

### **Errors Associated with Direct Observation**

Although there is no interaction with the subject, direct observation is not error-free; the observer may add subjectivity to the recording. The same visual cues that may influence the interplay between an interviewer and a respondent (e.g., the subject's age or sex) may also come into play in some types of direct observation settings. For example, the observer may subjectively attribute a particular economic status or educational background to the subject. A

## DOCTORS SHOULD EXAMINE THEIR WATCHES

When questioned in a survey, doctors said they spend about nine times as long giving information to patients as they actually do.<sup>6</sup> The physicians who were directly questioned answered [that] they spent about 12 minutes giving information to the average patient, but videotapes of the doctor/patient encounters indicated doctors spent only 1.3 min-

utes giving information. Further, doctors underestimate how much their patients want to know about their illness. When doctors' answers were compared with patients' answers about how much patients wanted to know, doctors underestimated the amount of information two out of three times.

**observer bias**

A distortion of measurement resulting from the cognitive behavior or actions of the witnessing observer.

distortion of measurement resulting from the cognitive behavior or actions of the witnessing observer is called **observer bias**. Exhibit 11.3, an excerpt from the observation section of a survey, shows how fieldworkers may be required to rely on their own interpretations of people or situations during the observation process.

If the observer does not record every detail that describes the persons, objects, and events in a given situation, accuracy may suffer. As a general guideline, the observer should record as much detail as possible. However, the pace of events, the observer's memory, the observer's writing speed, and other factors will limit the amount of detail that can be recorded.

Interpretation of observation data is another major source of potential error. Facial expressions and other nonverbal communication may have several meanings. Does a smile always mean happiness? Does the fact that someone is standing or seated in close proximity to the president of a company necessarily indicate the person's status?

 **TO THE POINT**

*What we see depends mainly on what we look for.*

SIR JOHN LUBBOCK

**Response Latency**

The time it takes to decide between two alternatives is a relatively simple, unobtrusive measure known as **response latency**. Response latency is a measure of the strength of the preference between alternatives. It is hypothesized that the longer a decision maker takes to make a choice between two alternatives, the closer the two alternatives are in terms of preference. If a quick decision is made, researchers hypothesize that there is considerable "psychological distance" between alternatives. The response latency measure is growing more popular now that computer-assisted data collection methods are becoming more common (i.e., the computer records the decision time).

**response latency**

The time it takes to decide between two alternatives; used as a measure of the strength of preference.

**Scientifically Contrived Observation**

Most observation takes place in a natural setting. Observing subjects in an artificial environment in order to test a hypothesis is called **contrived observation**. Contrived observation can increase the frequency of certain behavior patterns. For example, an airline passenger complaining about a meal or poor service from the flight attendant may actually be a researcher recording the flight attendant's reactions. If situations weren't contrived, the research time spent

**contrived observation**

Observation in which the investigator creates an artificial environment in order to test a hypothesis.

AN OBSERVATION FORM<sup>7</sup>

SECTION M: BY OBSERVATION ONLY

M1. IF ANYONE WAS PRESENT DURING THE INTERVIEW OTHER THAN R AND INTERVIEWER GIVE THE FOLLOWING DETAILS FOR EACH:

	PERSON 1	PERSON 2	PERSON 3
M1a. Age, approximately			
M1b. Relationship to R			
M1c. Present for how much of the interview?			
M1d. How closely was (s)he listening?	<input type="checkbox"/> 1. CLOSELY <input type="checkbox"/> 2. CASUALLY <input type="checkbox"/> 3. HARDLY AT ALL	<input type="checkbox"/> 1. CLOSELY <input type="checkbox"/> 2. CASUALLY <input type="checkbox"/> 3. HARDLY AT ALL	<input type="checkbox"/> 1. CLOSELY <input type="checkbox"/> 2. CASUALLY <input type="checkbox"/> 3. HARDLY AT ALL
M1e. Did (s)he make any comments on R's answers?			

M2. R's Race?  1. WHITE  5. BLACK  OTHER: \_\_\_\_\_ (Specify)

M3. Rate R's physical appearance:

1. STRIKINGLY HANDSOME OR BEAUTIFUL  2. GOOD-LOOKING (ABOVE AVERAGE FOR AGE AND SEX)  
 3. AVERAGE LOOKS FOR AGE AND SEX  4. QUITE PLAIN (BELOW AVERAGE FOR AGE AND SEX)  5. HOMELY

M4. How tall would you say R was? \_\_\_\_\_ FEET \_\_\_\_\_ INCHES

M5. Rate R's apparent intelligence?

1. VERY HIGH  2. ABOVE AVERAGE  3. AVERAGE  4. BELOW AVERAGE  5. VERY LOW

M6. How suspicious did R seem to be about the study, before the interview?

1. NOT AT ALL  3. SOMEWHAT  5. VERY SUSPICIOUS

M7. Overall, how great was R's interest in the interview?

1. VERY HIGH  2. ABOVE AVERAGE  3. AVERAGE  4. BELOW AVERAGE  5. VERY LOW

M8. How sincere did R seem to be in his answers, especially to the ones using the CARD 3?

1. COMPLETELY SINCERE  2. USUALLY SINCERE  3. OFTEN SEEMED TO BE INSINCERE

Note: R = respondent, DU = dwelling unit



M8a. Were there any particular parts of the interview for which you doubted R's sincerity? If so, name them by section or question numbers:

\_\_\_\_\_

\_\_\_\_\_

M9. How clean was the interior of the DU?

1. VERY CLEAN  2. CLEAN  3. SO-SO  4. NOT VERY CLEAN  5. DIRTY

M10. How much reading material was visible in the DU?

1. A LOT  2. SOME  3. NONE

M11. TYPE OF STRUCTURE IN WHICH FAMILY LIVES:

<input type="checkbox"/> 01. TRAILER	<input type="checkbox"/> 07. APARTMENT HOUSE (5 OR MORE UNITS, 3 STORIES OR LESS)
<input type="checkbox"/> 02. DETACHED SINGLE FAMILY HOUSE	<input type="checkbox"/> 08. APARTMENT HOUSE (5 OR MORE UNITS, 4 STORIES OR MORE)
<input type="checkbox"/> 03. 2-FAMILY HOUSE, 2 UNITS SIDE BY SIDE	<input type="checkbox"/> 09. APARTMENT IN A PARTLY COMMERCIAL STRUCTURE
<input type="checkbox"/> 04. 2-FAMILY HOUSE, 2 UNITS ONE ABOVE THE OTHER	<input type="checkbox"/> 10. OTHER (SPECIFY) _____
<input type="checkbox"/> 05. DETACHED 3-4 FAMILY HOUSE	
<input type="checkbox"/> 06. ROW HOUSE (3 OR MORE UNITS IN AN ATTACHED ROW)	

M12. NUMBER OF STORIES IN THE STRUCTURE, NOT COUNTING BASEMENT:

1  2  3  MORE THAN 3: \_\_\_\_\_  
(SPECIFY)

M13. NEIGHBORHOOD: Look at 3 structures on each side of DU but not more than 100 yards or so in both directions and check as many boxes as apply, below.

<input type="checkbox"/> 00. VACANT LAND ONLY	<input type="checkbox"/> 07. APARTMENT HOUSE (5 OR MORE UNITS, 3 STORIES OR LESS)
<input type="checkbox"/> 01. TRAILER	<input type="checkbox"/> 08. APARTMENT HOUSE (5 OR MORE UNITS, 4 STORIES OR MORE)
<input type="checkbox"/> 02. DETACHED SINGLE FAMILY HOUSE	<input type="checkbox"/> 09. APARTMENT IN A PARTLY COMMERCIAL STRUCTURE
<input type="checkbox"/> 03. 2-FAMILY HOUSE, 2 UNITS SIDE BY SIDE	<input type="checkbox"/> 10. WHOLLY COMMERCIAL OR INDUSTRIAL STRUCTURE
<input type="checkbox"/> 04. 2-FAMILY HOUSE, 2 UNITS ONE ABOVE THE OTHER	<input type="checkbox"/> 11. PARK
<input type="checkbox"/> 05. DETACHED 3-4 FAMILY HOUSE	<input type="checkbox"/> 12. SCHOOL OR OTHER GOVERNMENTAL BUILDING
<input type="checkbox"/> 06. ROW HOUSE (3 OR MORE UNITS IN AN ATTACHED ROW)	<input type="checkbox"/> 13. OTHER (Specify) _____

waiting and observing situations would expand considerably. The term *mystery shopper* is used by a number of retailers to describe this type of research, in which an observer posing as a shopper comes into a store and pretends to be interested in a particular product or service. After leaving the store, the unknown shopper (observer) evaluates the performance of the salesperson.

## OBSERVING SOCIAL SETTINGS

In many situations the purpose of observation is to summarize, systematize, and simplify the activities, meaning, and relationships in a social setting. Often, unstructured methods provide the observer with the greatest flexibility. No restrictive checklist or data collection instruments limit the information recorded in the field notes.<sup>8</sup>

### What Should Be Observed?

The definition of the problem will, of course, dictate what information is recorded. However, in general, several elements are of interest in most social settings:

1. *The participants.* The observer wants to know who the participants are. How are they related to one another? How many are there? There are various ways of characterizing the participants, but usually an observer wants to know at least the following about any person who is being observed: age, sex, official function (executive, employee, customer, supplier) in the situation being observed and in the organizational system or the broader social system. An observer also wants to know how the participants are related to one another: Are they strangers or do they know one another? Are they members of some collectivity, and if so, what kind—an informal friendship group, a union, a factory, a retail store? What structures or groupings exist among the participants? Can cliques, focal persons, or isolates be identified by their spatial groupings or patterns of interaction?
2. *The setting.* Social interactions may occur in different settings—a corporate headquarters, a shopping mall, a factory lunchroom, a palatial convention hotel. In addition to noting the appearance of the setting, an observer wants to know what kinds of behavior it encourages, permits, discourages, or prevents. The social characteristics of the setting may also be described in terms of the kinds of behavior that are likely to be perceived as expected or unexpected, approved or disapproved, conforming or deviant.
3. *The purpose.* Is there some official purpose that has brought the participants together, or have they met by chance? If there is an official purpose, what is it—to attend a sales meeting, to compete in a boat race, to participate in an awards ceremony, to meet as a committee, to have fun at a party? How do the participants react to the official purpose of the situation—for example, with acceptance or with rejection? What goals other than the official purpose do the participants seem to be pursuing? Are the goals of the various participants compatible or antagonistic?
4. *The social behavior.* The observer wants to know what actually occurs. What do the participants do? How do they do it? With whom and with what do they do it? With respect to behavior, the observer usually wants to know the following: (a) the stimulus or event that initiated it; (b) its apparent objective; (c) toward whom or what it is directed; (d) what type of behavior it is (talking, word processing, driving a car, gesturing); (e) the



Observation of consumers of juices and juice beverages revealed that many of them poured their beverages from large bottles they had purchased into smaller empty water bottles, the kind with a push-up top. This led to the conclusion that juices packaged in smaller, convenient-to-transport bottles would find a market.<sup>9</sup>

qualities of the behavior (its intensity, persistence, unusualness, appropriateness, duration, affectivity, mannerisms); (f) its effects (for example, the behavior it evokes from others).

5. *Frequency and duration.* The observer wants to know the answer to such questions as these: When did the situation occur? How long did it last? Is it a recurring situation, or is it unique? If it recurs, how frequently does it occur? What are the occasions that give rise to it? How typical of such situations is the one being observed?<sup>10</sup>

### Participant Observation

**participant observation**  
Situation in which an observer gains firsthand knowledge by being in or around the social setting being investigated.

**Participant observation** refers to an observation situation in which an observer gains firsthand knowledge by being in or around the social setting that is being investigated. The individual who joins a management group, for example, may be a known observer or may remain anonymous. In either case the observer generally uses a combination of direct observation and interviewing.

Interview questions may be asked during the course of a conversation or discussion, rather than in any structured format. Long and involved personal interaction with the subjects of the research is the prime advantage of participant observation. Extended contact with the subjects helps them feel comfortable in the participant observer's presence.

The participant observer must develop a system for recording his or her observations. Generally, the observer takes mental notes and jots down field notes where possible. At the end of the day more detailed field notes are recorded to summarize and synthesize the events and activities of the day.

### ETHICAL ISSUES IN HUMAN OBSERVATION

Observation methods introduce a number of ethical issues. Hidden observation raises the issue of the subjects' right to privacy. For example, a firm interested in acquiring information about how women put on their bras might

persuade some retailers to place one-way mirrors in dressing rooms so that this behavior may be observed unobtrusively. Obviously, there is an ethical question to be resolved in such a situation. Other observation methods, especially contrived observation, raise the possibility of deception of subjects.

Some people might see contrived observation as entrapment. To *entrap* means to deceive or trick into difficulty, which clearly is an abusive action. The problem is one of balancing values. If the researcher obtains permission to observe someone, the subject may not act in a typical manner. Thus, the researcher must determine his or her own view of the ethics involved and decide whether the usefulness of the information is worth telling a “white” lie.

## OBSERVATION OF PHYSICAL OBJECTS

### physical-trace evidence

A visible mark of some past event or occurrence.

Physical phenomena may be the subject of observation study. **Physical-trace evidence** is a visible mark of some past event or occurrence. For example, the wear on library books indirectly indicates which books are actually read (handled most) when checked out. At Chicago’s Museum of Science and Industry, the floor tiles around the hatching-chick exhibit must be replaced every 6 weeks, compared to years between replacement for tiles in other parts of the museum. The rate of wear for the tiles is a measure of the relative popularity of each exhibit.

Clearly, a creative business researcher has many options available for determining the solution to a problem. The story of Charles Coolidge Parlin, generally recognized as one of the founders of commercial business research, counting garbage cans at the turn of the 20th century illustrates another study of physical traces.

Parlin designed an observation study to persuade Campbell’s Soup Company to advertise in the *Saturday Evening Post*. Campbell’s was reluctant to advertise because it believed that the *Post* was read primarily by working people who would prefer to make soup from scratch, peeling the potatoes and scraping the carrots, rather than paying 10¢ for a can of soup. To demonstrate that rich people weren’t the target market, Parlin selected a sample of Philadelphia garbage routes. Garbage from each specific area of the city that was selected was dumped on the floor of a local National Guard Armory. Parlin had the number of Campbell’s soup cans in each pile counted. The results indicated that the garbage from the rich people’s homes didn’t contain many cans of Campbell’s soup. Although they didn’t make soup from scratch themselves, their servants did. The garbage piles from the blue-collar area showed a large number of Campbell’s soup cans. This observation study was enough evidence for Campbell’s. They advertised in the *Saturday Evening Post*.<sup>11</sup>

The method used in this study is also used in a scientific project at the University of Arizona in which aspiring archaeologists sift through modern garbage; they examine soggy cigarette butts, empty milk cartons, and half-eaten Big Macs. Investigation of Arizona household garbage has revealed many interesting findings. For example, in Hispanic households the most popular baby food is squash.<sup>12</sup> It accounts for 38 percent of the baby food vegetables Hispanic babies consume. By contrast, in Anglo households peas account for 29 percent of all baby vegetables; squash ranks only above spinach, which is last. (Squash has been a dietary staple in Mexico and Central America for more than 9,000 years.) Sorting through fast-food restaurants’ garbage reveals that wasted food from chicken restaurants (not counting bones) accounts for



## ENVIROSELL

Paco Underhill runs Envirosell, a New York consumer research company that conducts observation research. He became interested in using cameras to analyze the flow of human traffic through public places after hearing a lecture by urban geographer William Whyte. Envirosell's clients include companies such as Quaker Foods, Revlon, Hallmark Cards, and Bloomingdale's. The following is one reporter's account of what he learned about the value of observation research.

Underhill's research in retail settings led him to develop a body of observations he calls "aisle theory."<sup>13</sup> Among his seminal findings is something we'll call the *derriere-brush factor*, although he calls it by another name. At his offices in New York, he showed me a film-clip shot with a time-lapse camera aimed at a tie display in a narrow, heavily traveled aisle of the Bloomingdale's department store in Manhattan. Such aisles, meant to carry shoppers from store entrances onward into the store, are known in the retail industry as "driveways" or "power aisles."

Shoppers entered and dispersed; most zipped right by the ties. Underhill stopped the projector.

"Stand up," he commanded.

I stood.

"OK, you are standing at a counter. You are looking at ties. One of the most sensitive parts of your anatomy is your tail."

He began brushing my tail with his hand. *Derriere-brush factor*, he told me, "is simply the idea that the more likely you are to be brushed from the rear while you shop, the less likely you'll be converted from browser to buyer." In retail-speak, the "conversion ratio" of that display or counter will be low.


Underhill's stop-action film showed how few people stopped to examine the ties in the rack. Traffic swept past the few browsers in disconcerting volume.

When Bloomingdale's chairman saw the video, he called the clerk in charge of that department and had him move the tie rack out of the driveway. Later, a Bloomingdale's vice president called Underhill and told him the chairman had personally had the sales tracked from that lone tie rack and discovered that within 6 weeks the increase had paid for Underhill's services. "That told me two things," Underhill said.

35 percent of all food bought. This is substantially greater than the 7 percent of wasted food at fast-food hamburger restaurants.

What is most interesting about the garbage project is the comparison between the results of surveys about food consumption and the contents of respondents' garbage—garbage does not lie.<sup>14</sup> The University of Arizona project indicates that people consistently underreport the quantity of junk food they eat and overreport the amount of fruit and diet soda they consume. Most dramatically, however, studies show that alcohol consumption is underreported by 40 to 60 percent.

Garbage is even more revealing in Buenos Aires, Argentina. The research company Garbage Data Dynamics analyzes discarded containers, newspapers, and other garbage in that city. Because garbage is collected daily in Buenos Aires and people typically dispose of garbage in small bags with grocery store names printed on them, certain types of data that cannot be collected in the United States can be obtained. The results are so specific that they can show what brand of soft drink was consumed with a certain meal.

 TO THE POINT

*What would you rather believe?  
What I say, or what you saw with  
your own eyes?*

GROUCHO MARX

One, I wasn't charging enough, and two, the markup on ties was even more obscene than I thought."

"He picks up common sense things," said Judith Owens, vice president, marketing, of the National Retail Federation in New York, who periodically invites Underhill to show his stop-action films to the federation's many members. She watched one film of an audio store that drew a mostly teenage clientele, yet placed its racks of CDs so high the kids couldn't reach them. "You watch that happen, then you hear Paco say if you drop your display by 18 inches you'll increase your productivity. Everybody says, my God, I never thought of that."

He showed AT&T that almost 20 percent of the people who came into its Phone Center stores were under 10 years old, and how salespeople spent a lot of their time simply protecting expensive phone systems displayed too close to the ground. His films showed how most people who entered a Revco drugstore failed to pick up a shopping basket and thus were automatically limited to buying only what they could carry.

Early in 1991, the Woolworth Corporation asked Underhill to study several of its Champs Sports

stores to help figure out which layouts and designs worked best. Woolworth was planning a huge national expansion of the chain. It knew that sales from the rear section of each store—the "hard goods" section displaying such items as weights and basketballs—lagged far behind sales from other sections, but it didn't know why.

John Shanley, director of research for Woolworth, remembers how Underhill's stop-action film instantly solved the mystery. During peak sales periods, a line of customers would form from the cash register to the opposite wall of the store. "It literally prevented people from going from the front to the back," Shanley recalls. "They walked up to this line, turned and walked away." As a result, all of Champs' 500 stores now feature a checkout area (known in the industry as the "cash-wrap") designed so that lines form along an axis from front to back. "All of a sudden the sales in the back of the store picked up." Shanley recalled.

But, I asked, shouldn't that barrier effect have been obvious without Underhill's help? "The obvious," Shanley answered, "isn't always that apparent."

Counting and recording physical inventories by means of retail or wholesale audits allows researchers to investigate brand sales on regional and national levels, market shares, seasonal purchasing patterns, and so on. Business research suppliers offer audit data at both the retail and the wholesale levels.

An observer can record physical-trace data to discover things that a respondent could not recall accurately. For example, actually measuring the number of ounces of a liquid bleach used during a test provides precise physical-trace evidence without relying on the respondent's memory. The accuracy of respondents' memories is not a problem for the firm that conducts a pantry audit. The pantry audit requires an inventory of the brands, quantities, and package sizes in a consumer's home rather than responses from individuals. The problem of untruthfulness or some other form of response bias is avoided. For example, the pantry audit prevents the possible problem of respondents erroneously claiming to have purchased prestige brands. However, gaining permission to physically check consumers' pantries is not easy, and the fieldwork is expensive. Further, the brand in the pantry may not reflect the brand purchased most often if it was chosen because of a cents-off

coupon, because the brand normally purchased was out of stock, or for another reason.

## CONTENT ANALYSIS

### content analysis

A research technique for the objective, systematic, and quantitative description of the manifest content of communication.

**Content analysis** obtains data by observing and analyzing the content or message of advertisements, union contracts, reports, letters, and the like. It involves systematic analysis, as well as observation, to identify the specific information content and characteristics of the messages.

Content analysis studies the message itself. Its objective is to obtain a quantitative description of the manifest content of communication. This technique measures the extent of emphasis, or omission of emphasis, on any analytical category. For example, the content of newspaper articles about a company might be investigated with regard to the use of certain words, themes, characters, or space and time relationships. Investigating the frequency and appearance (or “roles”) of women, blacks, and other minorities in mass media is a research effort that utilizes content analysis.

Content analysis may ask questions such as: “Do certain advertisers use certain types of themes, appeals, claims, or deceptive practices more than other advertisers?” and “Have recent actions by the Federal Trade Commission influenced the content of advertising?” In order to plan effectively, a cable-television programmer might do a content analysis of network programming to evaluate its competition. For example, sports programs may be analyzed to see how much of the visual material is live action and how much is replay, or how many shots there are of cheerleaders and close-ups of spectators.

Study of the content of communications is more sophisticated than simply counting the items; it requires a system of analysis to secure relevant data. After one employee role-playing session involving “leaders” and “subordinates,” videotapes were analyzed to identify categories of verbal behaviors (e.g., positive reward statements, positive comparison statements, and self-evaluation requests). Then trained coders, using a set of specific instructions, recorded and coded the leaders’ behavior into specific verbal categories.

## MECHANICAL OBSERVATION

### mechanical observation

Observation technique that uses video cameras, traffic counters, and other machines to record behavior.


In many situations the primary—and sometimes the sole—means of observation is mechanical rather than human. In **mechanical observation**, videotape cameras, traffic counters, and other machines record behavior.

Some unusual observation studies have used a motion picture camera and time-lapse photography. An early application of this observation technique, photographing train passengers, determined passenger comfort by observing how the passengers sat and moved in their seats. Another time-lapse study, filming traffic flows in an urban “square,” resulted in the redesigning of peripheral streets. Similar techniques may be used in research to help design store layouts and to resolve problems in moving people or objects through various spaces over time.

### Television Monitoring

Perhaps the best-known business research project involving mechanical observation and computerized data collection is A. C. Nielsen’s system for estimating national television audiences. Nielsen uses a consumer panel and a

## TEXAS INSTRUMENTS AND E-LAB



E-Lab LLC is a business research and design firm in Chicago that specializes in observing people, identifying patterns in behavior, and developing an understanding of why these patterns exist.<sup>15</sup> The company then uses the knowledge that it gains as a framework in the product development process. Texas Instruments (TI) used E-Lab to investigate the mobility, connectivity, and communications needs of law enforcement officers, which led to ideas for a set of computing and communications products. As part of its product development research, TI's Advanced Integrated Systems Department and E-Lab researchers spent 320 hours shadowing police officers in three Texas police departments. Shadowing involves asking questions while observing. Researchers walked foot patrols, rode in patrol cars, and pedaled with bike patrols. They spent time with crowd control, narcotics, homicide, dispatch, and juvenile teams. They recorded their observations and interviews on paper, digital camera, and video.

A number of interesting findings emerged from all this research. First, police officers are very social, so it was important that any product TI developed should enhance socialization rather than detract from it. For example, an in-car computing and communications device should be able to access a database that lists names and numbers of experts on the force so that officers can call or e-mail the experts directly. Second, police officers are not driven by procedure. That told TI that the procedures for an investigation should reside in the device and that the device should prompt the officer at each step in the process. And third, officers rely on informal information about people and activities on their beats. This information may be kept on scraps of paper, on a spreadsheet back in the office, or in the police officer's head. Business researchers concluded that any device that TI develops should have a place to compile and share informal information.

sophisticated monitoring device called a PeopleMeter to obtain ratings for television programs in 18 countries.<sup>16</sup> Electronic boxes are hooked up to television sets to capture important information on program choices, the length of viewing time, and the identity of the viewer.

Knowing who in the family is watching allows executives to match television programs with demographic profiles. When the panel household's television set is turned on, a question mark appears on the screen to remind viewers to indicate who is watching. The viewer then uses a handheld electronic device that resembles a television remote control to record who is watching. A device attached to the television automatically sends the observed data—the viewer's age and sex and what programs are being watched—over telephone lines to Nielsen's computers. More than 5,000 households, scientifically selected to be representative of the U.S. population, have agreed to become members of the panel and have meters placed in their homes.

Critics of the PeopleMeter argue that subjects in Nielsen's panel grow bored over time and do not always record when they begin or stop watching television. Nielsen Media Research is working on a unique technology that will allow its PeopleMeters to scan the room, recognize each family member by his or her facial characteristics, and record when they enter or leave the room.





*Organizations with a presence on the World Wide Web find that their Web sites are a source of customer data. Researchers can combine a variety of technologies to learn who is visiting their sites. For example, "cookies," which observe and track a Web surfer's movements from page to page, and interactive surveys can be combined to provide consumer profiles of people who are attracted to advertising banners.*

Further into the future, as digital television evolves, the current PeopleMeter measurement technologies will become obsolete. For example, Nielsen is working on more sophisticated digital cable technology that uses a set-top box decoding system. The system will "ask" what the set-top box is doing and identify the channel or display on screen. The data, invisible and inaudible to viewers, will be sent to a central processing site during normal data transmission.<sup>17</sup> The TiVo digital television recorder, already on the market but used by only a small percentage of the population, uses similar technology. TiVo records viewing data, such as what commercials people skip by using fast-forward, that is quite valuable to marketers.

### **Monitoring Web Site Traffic**

Most organizations record how many people visit their Web sites. A *hit* occurs when a user clicks on a single page of a Web site. If the visitor clicks on many places to access graphics, or the like, that page receives multiple hits.<sup>18</sup> Organizations with Web sites consisting of multiple pages find it useful to track *page views*, or single, discrete clicks on individual pages. Page views more conservatively indicate how many users visit each individual page on the Web site, and they may also be used to track the path or sequence of pages that each visitor follows. A variety of information technologies are used to measure Web traffic and to maintain access logs.

Jupiter Media Metrix and Nielsen//NetRatings are companies that specialize in monitoring Internet activity. The typical Internet monitoring company installs a special tracking program on the personal computers of a sample of Internet users who agree to participate in the research effort. Nielsen//NetRatings has its software installed on 225,000 computers, in homes and workplaces, in 26 countries. Internet monitoring enables these companies to identify the popularity of Web sites (AOL.com and Yahoo.com

are among the most popular), measure the effectiveness of advertising banners, and provide other audience information. For example, a Jupiter Media Metrix study indicated that 63 percent of online shoppers stop short of completing their purchases after shipping charges are computed at the last step, known as the Checkout Line.

### Measuring Physiological Reactions

Business researchers have used a number of other mechanical devices to evaluate physical and physiological reactions to various stimuli. There are four major categories of mechanical devices used to measure physiological reactions: (1) eye-tracking monitors, (2) pupilometers, (3) psychogalvanometers, and (4) voice pitch analyzers.

A magazine or newspaper advertiser may wish to grab the reader's attention with a visual scene and then direct it to a package or coupon. Or an advertiser may wish to emphasize selling points identified by measuring "rough" television commercials with an eye-tracking monitor. Eye-tracking equipment records how the subject reads an ad (or views a television commercial) and how much time is spent looking at various stimuli. In physiological terms, the gaze movements of the eye are measured with an *eye camera* or *eye view monitor*.

Eye-tracking monitors measure unconscious eye movements. Originally developed to measure astronauts' eye fatigue, these devices track television viewers' eye movements and focal points through an invisible infrared light beam that "locks" onto subjects' eyes. Modern eye-tracking systems do not require keeping a viewer's head in a stationary position.



*Nissan North America in Torrance, California, is putting video cameras and tape recorders in some Nissan cars to learn more about how people behave when they are driving. So far, Nissan has used the tapes to suggest changes in seat design ("Drivers want to feel in touch with the road, while passengers want to be insulated from it"), to include more individual storage space ("People always look uncomfortable when they want to put something away"), and to change the thickness and texture of the steering wheel ("You can tell if someone is touching it like a caress or with revulsion").*

The other physiological measurement devices are based on a common principle:

Physiological research depends on the fact that adrenalin is produced when the body is aroused. When adrenalin goes to work, the heart beats faster and more strongly, and even enlarges.

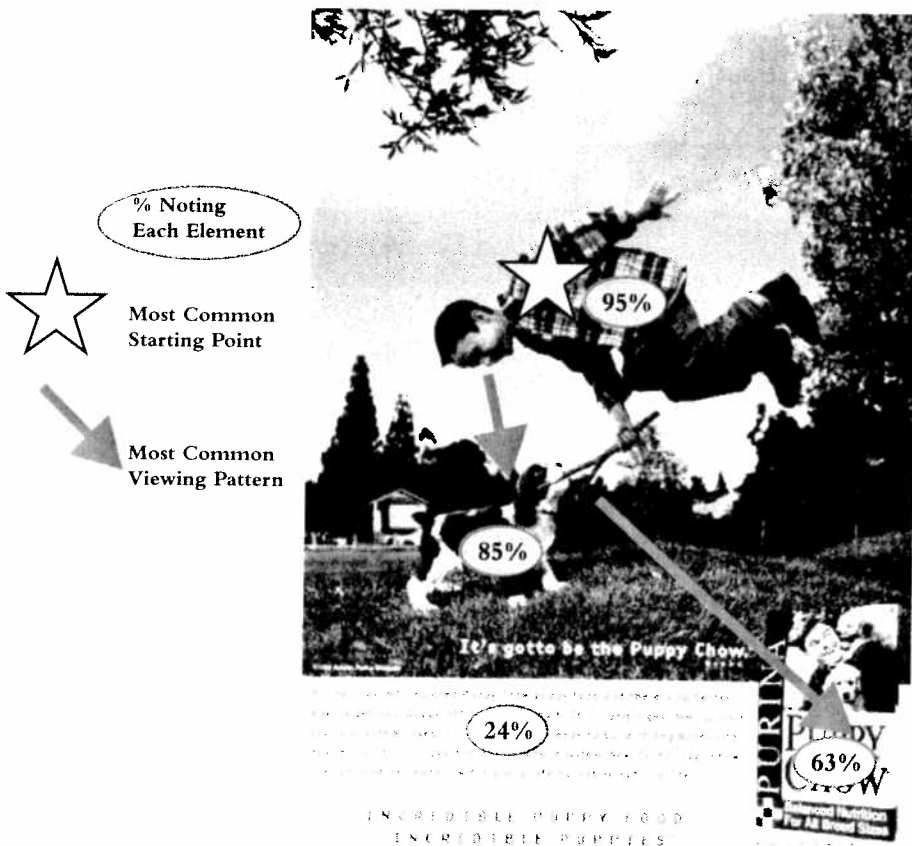
Blood flows to the extremities and increases capillary dilation at the fingertips and earlobes. Skin temperature increases, hair follicles stand up, skin pores emit perspiration, and the electrical conductivity of the skin surfaces is affected. Eye pupils dilate, electrical waves in the brain increase in frequency, breathing is faster and deeper, and the chemical composition of expired air is altered. This process offers a choice of about 50 different measures—the question of which measure to use is to some extent irrelevant since they are all measuring arousal.<sup>19</sup>

**pupilometer**

A device used to observe and record changes in the diameter of the pupils of the eyes.

A **pupilometer** observes and records changes in the diameter of the pupils of the eyes. Subjects are instructed to look at a screen on which an advertisement (or other stimulus) is projected. If the brightness and distance of the stimulus from the subject's eyes are held constant, changes in pupil size may be interpreted as changes in cognitive activity, resulting from the stimulus (rather than from eye dilation and constriction in response to light intensity, distance from

**How This Advertisement Was Read**



Measurements with an eye-tracking monitor of subjects' responses to this ad for Purina Puppy Chow showed that only 24 percent of consumer viewing time was given to the body copy message and that 95 percent of the viewers started looking at the boy at the top of the ad. The arrows show the most common viewing pattern.

**Psychogalvanometer**  
A device that measures galvanic skin response (GSR), involuntary changes in the electrical resistance of the skin.

**Voice pitch analysis**  
A physiological measurement technique that records abnormal frequencies in the voice that are supposed to reflect emotional reactions to various stimuli.

the object, or other physiological reactions to the conditions of observation). This research is based on the assumption that increased pupil size reflects positive attitudes toward and interest in the stimulus.

A **psychogalvanometer** measures galvanic skin response (GSR), or involuntary changes in the electrical resistance of the skin. Use of this device is based on the assumption that physiological changes, such as increased perspiration, accompany emotional reactions to advertisements, packages, and slogans. Excitement increases the perspiration rate of the body, which increases the electrical resistance of the subject. The test is an indicator of emotional arousal or tension.

Each of these mechanical devices has a limitation in that the subjects it is used with are usually in an artificial setting (watching television in a laboratory rather than at home) and know that they are being observed.

**Voice pitch analysis** measures emotional reactions as reflected in physiological changes in a person's voice. Abnormal frequencies in the voice, caused by changes in the autonomic nervous system, are measured with sophisticated audio-adapted computer equipment. This technique does not require subjects to be surrounded by mazes of wires or masses of equipment.

All of the devices described above assume that physiological reactions are associated with persuasiveness or that they predict some cognitive response, but this has not yet been clearly demonstrated. No strong theoretical evidence supports the argument that physiological change is a valid measure of attitude change or behavior change.

Another problem with physiological research relates to the *calibration*, or sensitivity, of measuring devices. Identifying arousal is one thing, but precisely measuring *levels* of arousal is another. In addition, most of these devices are very expensive. However, as a prominent researcher points out, physiological measurement is coincidental: "Physiological measurement isn't an exit interview. It's not dependent on what was remembered later on. It's a live blood, sweat, and tears, moment-by-moment response, synchronous with the stimulus."<sup>20</sup>

### Optical Scanners and Bar Codes

Mechanical observation can also be based on optical character recognition or bar code systems such as the universal product code (UPC). Optical scanners in supermarkets provide a wealth of product and brand sales information. Substituting mechanized record keeping for human record keeping has resulted in greater accuracy and more rapid feedback about store activity. Systems based on the UPC bar-code technology have been implemented in factories, warehouses, and transportation companies to research inventory levels, shipments, and the like.

### OBSERVATION

Observation is the systematic process of recording the behavioral patterns of people, objects, and occurrences as they are witnessed. Questioning or communicating with the individuals under investigation does not need to occur.

Business researchers employ both human observers and machines designed for specific observation tasks. Human observation is commonly used when the situation or behavior to be recorded is not easily predictable in advance of the

research. Mechanical observation can be used when the situation or behavior to be recorded is routine, repetitive, or programmatic. Human or mechanical observation may both be unobtrusive. Human observation may suffer from observer bias, however, even though the observer does not interact with the subject.

Seven kinds of phenomena can be observed: physical actions, verbal behavior, expressive behavior, spatial relations and locations, temporal patterns, physical objects, and verbal and pictorial records. Thus, both verbal and non-verbal behavior may be observed. A major disadvantage of the observation technique is that cognitive phenomena such as attitudes, motivations, expectations, intentions, and preferences cannot be observed. Further, only overt behavior of short duration can be observed. Many types of data can be obtained more accurately through direct observation than by questioning respondents. Observation is often the most direct or the only method for collection of certain data.

Observation can sometimes be “contrived” by creating the situations that are to be observed. This is done to reduce the time and expense of obtaining reactions to certain circumstances.

Physical-trace evidence serves as a visible record of past events. Content analysis obtains data by observing and analyzing the content of messages in written and/or spoken communications. Mechanical observation uses a variety of devices to record physiological data.

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## Key Terms

scientific observation  
visible observation  
hidden observation  
direct observation  
observer bias

mechanical observation  
pupilometer  
response latency  
contrived observation  
participant observation

physical-trace evidence  
content analysis  
psychogalvanometer  
voice pitch analysis

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## Questions for Review and Critical Thinking

1. Yogi Berra, former New York Yankee catcher, said, “You can observe a lot just by watching.” How does this fit in with the definition of scientific observation?
2. What are the advantages and disadvantages of observation studies compared to surveys?
3. Under what conditions are observation studies most appropriate?
4. Suggest some new uses for observation studies. Be creative.
5. A multinational fast-food corporation plans to locate a restaurant in La Paz, Bolivia. Secondary data for this city are outdated. How might you determine the best location using observation?
6. Discuss how an observation study might be combined with a personal interview.
7. The lost-letter technique has been used to predict voting behavior. Letters addressed to various political groups are spread throughout a city. The “respondent” finds an envelope, reads the address of a group supporting (or opposing) a candidate, and mails back (or throws away) the envelope. It is assumed that the respondent’s action indicates a favorable (or unfavorable) attitude toward the organization. Would this technique be appropriate in business research?
8. Outline a research design using observation for each of the following situations:
  - (a) A bank wishes to collect data on the frequency of customer use of its various services.
  - (b) A state government wishes to determine the driving public’s use of seat belts.
  - (c) A researcher wishes to know how many women have been featured on *Time* covers over the years.
  - (d) A fast-food franchise wishes to determine how long a customer entering a store has to wait for his or her order.

- (e) A magazine publisher wishes to determine exactly what people see and what they pass over while reading one of its magazines.
  - (f) A food manufacturer wishes to determine how people use snack foods in their homes.
  - (g) An overnight package delivery service wishes to observe delivery workers beginning when they stop the truck, continuing through the delivery of the package, and ending when they return to the truck.
9. Watch the nightly news on a major network for 1 week. Observe how much time is devoted to national news, commercials, and other activity. (Hint: Think carefully about how you will record the contents of the programs.)
10. Comment on the ethics of the following situations:
- (a) During the course of telephone calls to investors, a stockbroker records their voices

when they are answering sensitive investment questions and then conducts a voice pitch analysis. The respondents do not know that their voices are being recorded.

- (b) A researcher plans to invite consumers to be test users in a simulated kitchen located in a shopping mall and then to videotape their reactions to a new microwave dinner from behind a one-way mirror.
- (c) A business researcher arranges to purchase the trash from the headquarters of a major competitor. The purpose is to sift through discarded documents to determine the company's strategic plans.

### Exploring the Internet

1. The University of Arizona Department of Anthropology houses the Bureau of Applied Research in Anthropology. The garbage project is one of the bureau's research activities. Use a search engine to find the University of Arizona's home page and then navigate to the garbage project. What information is available?
2. If you are interested in content analysis, go to the UCLA Television Violence Monitoring Project at



<http://www.media-awareness.ca/eng/med/home/resource/ucla.htm> or to the National Clearinghouse for Alcohol and Drug Information's project on Substance Use in Popular Prime-Time Television at <http://www.health.org/govstudy/tvmediastudy/index.htm>.

### Case Suggestions

- Case 12: Tulsa's Central Business District (C)
- Case 13: The Pretesting Company