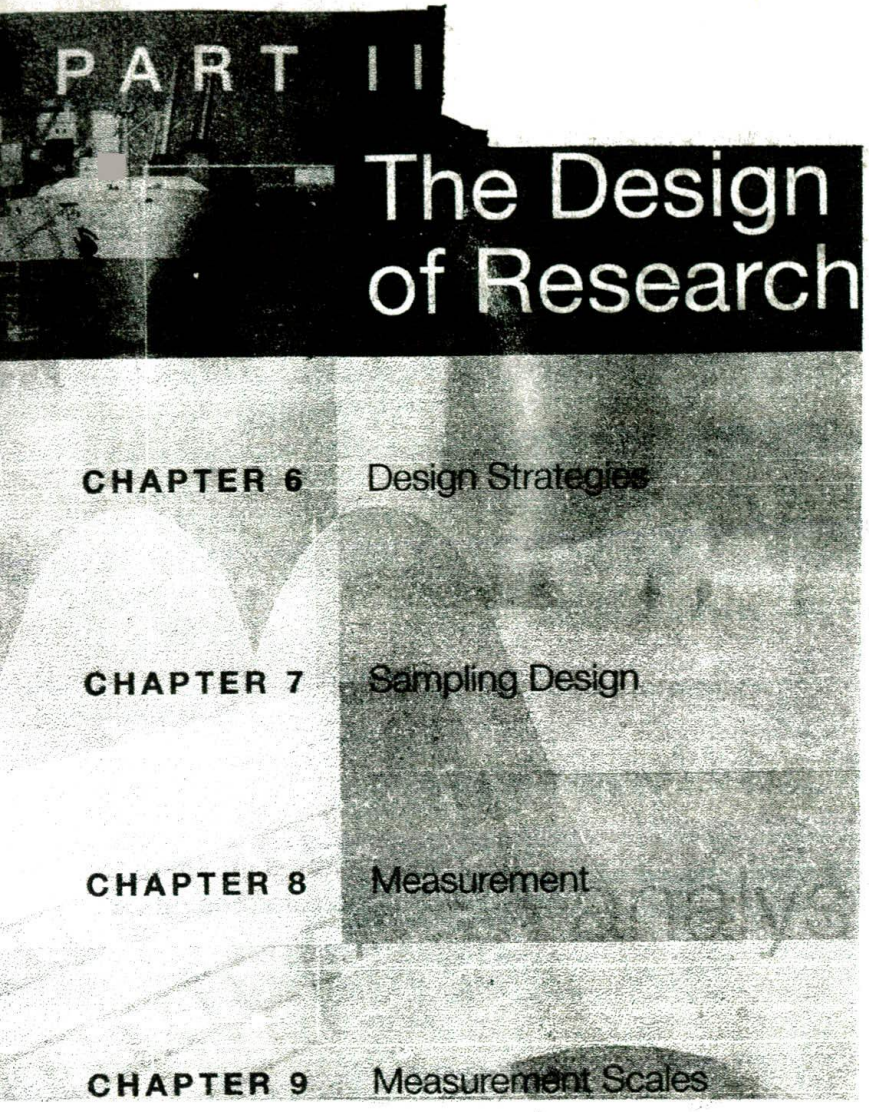


# PART II

# The Design of Research


CHAPTER 6 Design Strategies

CHAPTER 7 Sampling Design

CHAPTER 8 Measurement

CHAPTER 9 Measurement Scales

CHAPTER 6

# Design Strategies

## Learning Objectives

After reading this chapter, you should understand . . .

1 **The basic stages of research design.**

2 **The major descriptors of research design.**

3 **The major types of research designs.**

4 **The relationships that exist between variables in research design and the steps for evaluating those relationships.**

# Bringing Research to Life

"Aarghh!"

Jason Henry leaped up and tossed a paper cup full of coffee at his TV. It hit the set and bounced off, leaving coffee dripping down the screen.

"What's wrong? Are you hurt? I'M A DOCTOR!" hollered Dorrie from the bedroom. "And what time is it anyway?"

"Go back to sleep, Dorrie," replied Myra. "It's 2:30 A.M., and your husband just chose to throw his coffee at the TV, rather than drink it, because he doesn't care for the anchor on cable news."

"She's totally unscientific, you know," grumped Jason.

"She's an inexperienced kid getting her first break on the network," stated Myra, "at an hour when no sane person is watching TV anyway, let alone subjecting it to scientific criticism. So chill out, lad."

To Dorrie she shouted, "We are almost finished here, and soon you will have your husband back."

"It is terrifically unscientific," he said, "to make unsubstantiated conclusions as she did."

"I thought she did a fine job interviewing that psychiatrist—terribly amusing," said Myra. "He was a beautiful choice, with his accent and a beard that reminded me of Freud himself."

"That's not the issue, Myra, and you know it. The fact is, she should not have claimed that when the recent hurricane brushed Galveston, it caused a rash of complaints against auto dealerships."

"I thought she did a moderately good job in the interviews. That was an adorable young couple she found picketing the Mercedes dealership—the girl in a mink jacket and her husband in Gucci loafers, and both of them complaining they were powerless against big business—and you already know how effective I thought the shrink was in presenting his theory of hurricane-induced anger causing people to lash out at business."

"Not the point, again. As entertainment it was admirable. But it was rotten science. She had no before-after comparison. I want to know how many people had complaints against dealerships before the hurricane hit. Pretty clearly, she not only had no file footage of before the hurricane, but she also had no statistics. For all I know the complaint behavior has not changed."

"Do you really believe, Jason, that anyone would have the foresight to collect such information?"

"Why not? The newspapers and TV stations on the Gulf are continually hyping the threat of hurricanes. They must make a fortune selling commercial time at inflated rates during hurricane season. So, yes, they knew a hurricane was due sometime in the near future, or was at least possible, and if they were responsible they would have done baseline measurements . . ."

"Not really feasible . . ."

". . . or at least refrain from such pseudoscientific bunkum."

"Is that it? Is that your complaint?"

"That's part of it. The other part is that the hurricane brushed Galveston then skittered out into the Gulf. Forty miles away, Houston was barely touched. Did she bother to check if complaint behavior in Houston was also elevated? Because if it was, that would debunk her theory that the hurricane caused the complaint behavior. You can't blame something that occurred in one location and not in the other for causing behavior seen in both locations. Can you?"

"I guess not."

"So, what did you learn, Myra?" he asked with a touch of condescension.

She laughed heartily. "I learned not to pick a fight with you after hours of steady proposal writing. I learned that after 13 cups of coffee you become humorless, pedantic, and compulsively left-brained. I learned it is time for you to join your infinitely patient wife. See you for breakfast."

## What Is Research Design?

There are many definitions of research design, but no one definition imparts the full range of important aspects. Several examples from leading authors can be cited:

> The research design constitutes the blueprint for the collection, measurement, and analysis of data. It aids the scientist in the allocation of his limited resources by posing crucial choices: Is the blueprint to include experiments, interviews, observation, the analysis of records, simulation, or some combination of these? Are the methods of data collection and the research situation to be highly structured? Is an intensive study of a small sample more effective than a less intensive study of a large sample? Should the analysis be primarily quantitative or qualitative?[1]

And:

> Research design is the plan and structure of investigation so conceived as to obtain answers to research questions. The plan is the overall scheme or program of the research. It includes an outline of what the investigator will do from writing hypotheses and their operational implications to the final analysis of data. A structure is the framework, organization, or configuration of . . . the relations among variables of a study. A research design expresses both the structure of the research problem and the plan of investigation used to obtain empirical evidence on relations of the problem.[2]

These definitions differ in detail, but together they give the essentials of **research design:**

- The design is an activity- and time-based plan.
- The design is always based on the research question.
- The design guides the selection of sources and types of information.
- The design is a framework for specifying the relationships among the study's variables.
- The design outlines procedures for every research activity.

Thus, the design provides answers for questions such as these: What techniques will be used to gather data? What kind of sampling will be used? How will time and cost constraints be dealt with?

### Classification of Designs

Early in any research study, one faces the task of selecting the specific design to use. A number of different design approaches exist but, unfortunately, no simple classification system defines all the variations that must be considered. Exhibit 6–1 classifies research design using eight different descriptors.[3] A brief discussion of these descriptors illustrates their nature and contribution to research.

**Degree of Research Question Crystallization** A study may be viewed as exploratory or formal. The essential distinctions between these two options are the degree of structure and the immediate objective of the study. **Exploratory studies** tend toward loose structures with the objective of discovering future research tasks. The immediate purpose of exploration is usually to develop hypotheses or questions for further research. The **formal study** begins where the exploration leaves off—it begins with a hypothesis or research question and involves precise procedures and data source specifications. The goal of a formal research design is to test the hypotheses or answer the research questions posed.



**EXHIBIT 6–1 Descriptors of Research Design**

| Category | Options |
|---|---|
| The degree to which the research question has been crystallized | • Exploratory study<br>• Formal study |
| The method of data collection | • Monitoring<br>• Interrogation/communication |
| The power of the researcher to produce effects in the variables under study | • Experimental<br>• Ex post facto |
| The purpose of the study | • Descriptive<br>• Causal |
| The time dimension | • Cross-sectional<br>• Longitudinal |
| The topical scope—breadth and depth—of the study | • Case<br>• Statistical study |
| The research environment | • Field setting<br>• Laboratory research<br>• Simulation |
| The participants' perceptions of research activity | • Actual routine<br>• Modified routine |

*You may find it helpful to revisit Exhibit 3–1 as we discuss these descriptors.*

The exploratory-formal study dichotomy is less precise than some other classifications. All studies have elements of exploration in them, and few studies are completely uncharted. The sequence discussed in Chapter 3 (see Exhibit 3–1 and the model on the inside front cover) suggests that more formalized studies contain at least an element of exploration before the final choice of design. More detailed consideration of exploratory research is found later in this chapter.

*We use the term* **communication** *to contrast with* **monitoring** *because collecting data by questioning encompasses more than the survey method.*

**Method of Data Collection** This classification distinguishes between **monitoring** and interrogation/communication processes. The former includes studies in which the researcher inspects the activities of a subject or the nature of some material without attempting to elicit responses from anyone. Traffic counts at an intersection, license plates recorded in a restaurant parking lot, a search of the library collection, an observation of the actions of a group of decision makers, the State Farm Dangerous Intersection Study—all are examples of monitoring. In each case the researcher notes and records the information available from observations. Monitoring for MindWriter might include "following" a computer through the repair process, documenting each activity or interaction between CompleteCare and call center employees and the damaged laptop.

In the **interrogation/communication study,** the researcher questions the subjects and collects their responses by personal or impersonal means. The collected data may result from (1) interview or telephone conversations, (2) self-administered or self-reported instruments sent through the mail, left in convenient locations, or transmitted

## SNAPSHOT

The Second Global Entrepreneurship Monitor (GEM)

Researchers at the Kauffman Center for Entrepreneurial Leadership (Babson College) and the London Business School joined forces in 1997 to prove or disprove a conceptual model of cultural, economic, physical, and political factors to predict economic growth. The research design compensated for lack of control by using "a variety of nations with diversity in framework conditions, entrepreneurial sectors, business dynamics, and economic growth." The 1999 longitudinal study conducted in eight countries included various data collection methods:

- Standardized national primary data collected by each national research team.
- Two rounds of adult phone surveys of at least 1,000 adults per country (face-to-face in Japan) to measure entrepreneurial activity and attitude, completed and coordinated by an international market survey firm.
- Hour-long interviews with 4 to 39 experts (key informants) for each country.
- A detailed 12-page questionnaire completed by each key informant.

Market Facts (Arlington Heights, IL) did the first round of data collection in June 1998 (Canada, Finland, Germany, the United Kingdom, and the United States). Audience Selection, Ltd. (London), conducted the second round in March 1999 in all 10 countries. The 2000 study employed research teams from more than 21 countries, including 10 countries from the 1999 study. For the purpose of the study, entrepreneurship was defined as "any attempt to create a new business enterprise or to expand an existing business." Employing regression analysis, a weight was assigned to each factor of influence. The researchers discovered in the 1999 study that perception of opportunity (.79) and two measures of entrepreneurial potential—capacity (0.64) and motivation (0.93)—positively correlate with business start-up rates. The 2000 study created a Total Entrepreneurial Activity Index combining the nascent start-up rate (percent of adults engaged in activities related to starting a business) and the new firm rate (percent of adults reporting managing an owned-business without payroll to additional employees). This study is ongoing, but researchers thus far conclude that "support for the conceptual model is encouraging, although clearly not conclusive." Learn more about the findings in "A GEM of a Study" in the Cases section of this text.

**www2.babson.edu/babson/babsoneshipp.nsf/Public/HomePage**

**www.london.edu**

Speed and accuracy of data collection are two factors that influence research design. Both are promised in this ad for FieldSource.



electronically or by other means, or (3) instruments presented before and/or after a treatment or stimulus condition in an *experiment.* Myra and Jason propose a communication study, using a response card inserted in the packaging of laptops returned after CompleteCare servicing.

**Researcher Control of Variables** In terms of the researcher's ability to manipulate variables, we differentiate between experimental and ex post facto designs. In an **experiment,** the researcher attempts to control and/or manipulate the variables in the study. It is enough that we can cause variables to be changed or held constant in keeping with our research objectives. Experimental design is appropriate when one wishes to discover whether certain variables produce effects in other variables. Experimentation provides the most powerful support possible for a hypothesis of causation.

With an **ex post facto design,** investigators have no control over the variables in the sense of being able to manipulate them. They can only report what has happened or what is happening. It is important that the researchers using this design not influence the variables; to do so introduces bias. The researcher is limited to holding factors constant by judicious selection of subjects according to strict sampling procedures and by statistical manipulation of findings. MindWriter is planning an ex post facto design.

**The Purpose of the Study** The essential difference between descriptive and causal studies lies in their objectives. If the research is concerned with finding out *who, what, where, when,* or *how much,* then the study is **descriptive.** If it is concerned with learning why—that is, how one variable produces changes in another—it is causal. Research on crime is descriptive when it measures the types of crimes committed, how often, when, where, and by whom. In a **causal study,** we try to explain relationships among variables—for instance, why the crime rate is higher in city A than in city B. At the outset, the MindWriter project is descriptive, although subsequent studies might be causal.

**The Time Dimension** **Cross-sectional studies** are carried out once and represent a snapshot of one point in time. **Longitudinal studies** are repeated over an extended period. The advantage of a longitudinal study is that it can track changes over time. Jason and Myra's proposal describes a longitudinal study, with satisfaction measurements taken continuously over several months and reported monthly.

In longitudinal studies of the *panel* variety, the researcher may study the same people over time. In marketing, panels are set up to report consumption data on a variety of

## SNAPSHOT

John Deere and Co.: Environmental Scanning

Like many industrial industries, agricultural and construction equipment manufacturers have their most extensive contact with the widest range of customers at trade shows. During its 160-year history, John Deere has collected both quantitative and qualitative research with its dealers at such equipment trade shows. This closeness to the customer is only part of the continuous monitoring employed by John Deere. Its success in the highly volatile industries of construction and agriculture is owed to an ability to shift its strategic and tactical actions in the face of both rapid and evolving environmental change. In the last three decades, such changes included government actions (Carter's grain embargo of 1979), sociodemographic shifts (the move away from farming as a career), and economic downturns (the recession of the early 1990s). The research practices involved in environmental scanning are key to John Deere's ongoing success and its ability to rebound from intermittent poor performance. John Deere, with operations in more than 150 countries, had more than $239 million in income during 1999.

**www.deere.com**

products. These data, collected from national samples, provide a major databank on relative market share, consumer response to new products, and new promotional methods. Other longitudinal studies, such as *cohort groups,* use different subjects for each sequenced measurement. The service industry might have looked at the needs of aging baby boomers by sampling 40- to 45-year-olds in 1990 and 50- to 55-year-olds in 2000. Although each sample would be different, the population of 1945 to 1950 cohort survivors would remain the same.

Some types of information once collected cannot be collected a second time from the same person without the risk of bias. The study of public awareness of an advertising campaign over a six-month period would require different samples for each measurement.

While longitudinal research is important, the constraints of budget and time impose the need for cross-sectional analysis. Some benefits of a longitudinal study can be revealed in a cross-sectional study by adroit questioning about past attitudes, history, and future expectations. Responses to these kinds of questions should be interpreted with care, however.

**The Topical Scope** The statistical study differs from the case study in several ways. **Statistical studies** are designed for breadth rather than depth. They attempt to capture a population's characteristics by making inferences from a sample's characteristics. Hypotheses are tested quantitatively. Generalizations about findings are presented based on the representativeness of the sample and the validity of the design. MindWriter plans a statistical study.

**Case studies** place more emphasis on a full contextual analysis of fewer events or conditions and their interrelations. Although hypotheses are often used, the reliance on qualitative data makes support or rejection more difficult. An emphasis on detail provides valuable insight for problem solving, evaluation, and strategy. This detail is secured from multiple sources of information. It allows evidence to be verified and avoids missing data. Remember the proposed monitoring study for MindWriter? If MindWriter tracked one or more laptops, this could serve as a case study of the CompleteCare program.

Although case studies have been maligned as "scientifically worthless" because they do not meet minimal design requirements for comparison,[4] they have a significant scientific role. It is known that "important scientific propositions have the form of universals, and a universal can be falsified by a single counterinstance."[5] Thus, a single, well-designed case study can provide a major challenge to a theory and provide a source of new hypotheses and constructs simultaneously. Discovering new hypotheses to correct postservice complaints would be the major advantage of tracking a given number of damaged MindWriter laptops through the case study design.

**The Research Environment** Designs also differ as to whether they occur under actual environmental conditions **(field conditions)** or under staged or manipulated consitions **(laboratory conditions).**

To simulate is to replicate the essence of a system or process. **Simulations** are increasingly used in research, especially in operations research. The major characteristics of various conditions and relationships in actual situations are often represented in mathematical models. Role-playing and other behavioral activities may also be viewed as simulations. A simulation for MindWriter might involve an arbitrarily damaged laptop being tracked through the call center and the CompleteCare program, monitoring results at each workstation. Another popularly used simulation is the retail service study involving "mystery shoppers."

**Participants' Perceptions** The usefulness of a design may be reduced when people in a disguised study perceive that research is being conducted. **Participants' perceptions** influence the outcomes of the research in subtle ways or more dramatically as we learned from the pivotal Hawthorne studies of the late 1920s. Although there is no widespread evidence of attempts by participants or respondents to please researchers through successful hypothesis guessing or evidence of the prevalence of sabotage, when participants believe that something out of the ordinary is happening, they may behave less naturally. There are three levels of perception:

1. Participants perceive no deviations from everyday routines.
2. Participants perceive deviations, but as unrelated to the researcher.
3. Participants perceive deviations as researcher-induced.[6]

The "mystery shopper" scenario is the perfect example of the final level of perception noted in the above list. If a retail sales associate knows she is being observed and evaluated—with consequences in future compensation, scheduling, or work assignment—she is likely to change her performance. In all research environments and control situations, researchers need to be vigilant to effects that may alter their conclusions. Participants' perceptions serve as a reminder to classify one's study by type, to examine validation strengths and weaknesses, and to be prepared to qualify results accordingly.

## Exploratory Studies

Exploration is particularly useful when researchers lack a clear idea of the problems they will meet during the study. Through exploration researchers develop concepts more clearly, establish priorities, develop operational definitions, and improve the final research design. Exploration may also save time and money. If the problem is not as important as first thought, more formal studies can be canceled.

Exploration serves other purposes as well. The area of investigation may be so new or so vague that a researcher needs to do an exploration just to learn something about the dilemma facing the manager. Important variables may not be known or thoroughly defined. Hypotheses for the research may be needed. Also, the researcher may explore to be sure it is practical to do a formal study in the area. A federal government agency, the Office of Industry Analysis, proposed that research be done on how executives in a given industry made decisions about raw material purchases. Questions were planned asking how (and at what price spreads) one raw material was substituted for another in certain manufactured products. An exploration to discover if industry executives would divulge adequate information about their decision making on this topic was essential for the study's success.

Despite its obvious value, researchers and managers alike give exploration less attention than it deserves. There are strong pressures for quick answers. Moreover, exploration is sometimes linked to old biases about qualitative research: subjectiveness, nonrepresentativeness, and nonsystematic design. More realistically, exploration saves time and money and should not be slighted.

### Qualitative Techniques

The objectives of exploration may be accomplished with different techniques. Both qualitative and quantitative techniques are applicable, although exploration relies more heavily on **qualitative techniques.** One author creates a verbal picture to differentiate the two:

> Quality is the essential character or nature of something; quantity is the amount. Quality is the what; quantity the how much. Qualitative refers to the meaning, the definition or analogy or model or metaphor characterizing something, while quantitative assumes the meaning and refers to a measure of it . . . The difference lies in Steinbeck's [1941] description of the Mexican Sierra, a fish from the Sea of Cortez. One can count the spines on the dorsal fin of a pickled Sierra, 17 plus 15 plus 9. "But," says Steinbeck, "if the Sierra strikes hard on the line so that our hands are burned, if the fish sounds and nearly escapes and finally comes in over the rail, his colors pulsing and his tail beating the air, a whole new relational externality has come into being." Qualitative research would define the being of fishing, the ambiance of a city, the mood of a citizen, or the unifying tradition of a group.[7]

When we consider the scope of qualitative research, several approaches are adaptable for exploratory investigations of management questions:

MANAGEMENT Tip

- In-depth interviewing (usually conversational rather than structured).
- Participant observation (to perceive firsthand what participants in the setting experience).
- Films, photographs, and videotape (to capture the life of the group under study).
- Projective techniques and psychological testing (such as a Thematic Apperception Test, projective measures, games, or role-playing).
- Case studies (for an in-depth contextual analysis of a few events or conditions).
- Street ethnography (to discover how a cultural subgroup describes and structures its world at the street level).
- Elite or expert interviewing (for information from influential or well-informed people in an organization or community).
- Document analysis (to evaluate historical or contemporary confidential or public records, reports, government documents, and opinions).
- Proxemics and kinesics (to study the use of space and body-motion communication, respectively).[8]

When these approaches are combined, four exploratory techniques emerge with wide applicability for the management researcher:

1. Secondary data analysis.
2. Experience surveys.
3. Focus groups.
4. Two-stage designs.

## Secondary Data Analysis

The first step in an exploratory study is a search of the secondary literature. Studies made by others for their own purposes represent **secondary data.** It is inefficient to discover anew through the collection of **primary data** or original research what has already been done and reported at a level sufficient for management to make a decision.

Within secondary data exploration, a researcher should start first with an organization's own data archives. Reports of prior research studies often reveal an extensive amount of historical data or decision-making patterns. By reviewing prior studies, you can identify methodologies that proved successful and unsuccessful. Solutions that didn't receive attention in the past due to different environmental circumstances are revealed as potential subjects for further study. The researcher needs to avoid duplica-

## SNAPSHOT

Smith Barney's Benchmark Job Environment Research

As part of the negotiated settlement in the landmark sexual harassment suit brought against Smith Barney by 25 current and former employees [*Martens et al. v. Smith Barney* (S.D.N.Y., 96 Civ 3779)], the financial services firm was charged with conducting research to assess underlying perceptions contributing to the illegal behavior. Catalyst, a New York firm committed to advancing women in business, conducted the multistage study ordered by Judge Constance Barker-Motley. Nine focus groups (eight single-gender, one mixed-gender) were used to help define various concepts and constructs, followed by a mail survey of 838 men and women employed in seven firms in the financial services industry. Catalyst conducted in-depth interviews with six women who left lucrative jobs in the financial services industry to start their own firms, in addition to identifying exemplary policies and programs—"best practices"—currently used in the industry. While the study revealed some similarities, it reinforced that statistically significant differences exist between men and women on key variables that define job performance and job satisfaction. To learn more about this benchmark study, see "The Catalyst for Women in Financial Services" in the Cases section of this text.

**www.catalystwomen.org**

**www.salomonsmithbarney.com**

tion in instances when prior collected data can provide sufficient information for resolving the current decision-making dilemma. While MindWriter's CompleteCare program is newly introduced, it is likely that one or more studies of the previous servicing practices and policies revealed customer attitudes on which MindWriter based the design of the current program.

*We provide a detailed description of secondary data resources in Chapter 10 and Appendix A.*

The second source of secondary data is published documents prepared by authors outside the sponsor organization. There are tens of thousands of periodicals and hundreds of thousands of books on all aspects of business. Data from secondary sources help us decide what needs to be done and can be a rich source of hypotheses. Special catalogs, subject guides, and electronic indexes—available in most libraries—will help in this search. In many cases you can conduct a secondary search from your home or office using a computer, an online service, or an Internet gateway. Regarding MindWriter, thousands of articles have been written on customer service, and an Internet search using the keyword *customer service* reveals tens of thousands of hits.

If one is creative, a search of secondary sources will supply excellent background information as well as many good leads. Yet, if we confine the investigation to obvious subjects in bibliographic sources, we will often miss much of the best information. Suppose the Copper Industry Association is interested in estimating the outlook for the copper industry over the next 10 years. We could search through the literature under the headings "copper production" and "copper consumption." However, a search restricted to these two topics would miss more than it finds. When a creative search of the copper industry is undertaken, useful information turns up under the following reference headings: mines and minerals; nonferrous metals; forecasting; planning; econometrics; consuming industries such as automotive and communications; countries where copper is produced, such as Chile; and companies prominent in the industry, such as Anaconda and Kennecott.

### Experience Survey

While published data are a valuable resource, it is seldom that more than a fraction of the existing knowledge in a field is put into writing. A significant portion of what is known on a topic, while in writing, may be proprietary to a given organization and thus unavailable to an outside searcher. Also, internal data archives are rarely well organized, making secondary sources, even when known, difficult to locate. Thus, we will

profit by seeking information from persons experienced in the area of study, tapping into their collective memories and experiences.

When we interview persons in an **experience survey,** we should seek their ideas about important issues or aspects of the subject and discover what is important across the subject's range of knowledge. The investigative format we use should be flexible enough so that we can explore various avenues that emerge during the interview.

MANAGEMENT Tip

- What is being done?
- What has been tried in the past without success? With success?
- How have things changed?
- What are the change-producing elements of the situation?
- Who is involved in decisions and what role does each person play?
- What problem areas and barriers can be seen?
- What are the costs of the processes under study?
- Whom can we count on to assist and/or participate in the research?
- What are the priority areas?

The product of such questioning may be a new hypothesis, the discarding of an old one, or information about the practicality of doing the study. Probing may show whether certain facilities are available, what factors need to be controlled and how, and who will cooperate in the study.

Discovery is more easily carried out if the researcher can analyze cases that provide special insight. Typical of exploration, we are less interested in getting a representative cross-section than in getting information from sources that might be insightful. Assume we study StarAuto's automobile assembly plant. It has a history of declining productivity, increasing costs, and growing numbers of quality defects. People who might provide insightful information include

- **Newcomers to the scene**—Employees or personnel who may have been recently transferred to this plant from similar plants.
- **Marginal or peripheral individuals**—Persons whose jobs place them on the margin between contending groups. First-line supervisors and lead workers are often neither management nor worker but something in between.
- **Individuals in transition**—Recently promoted employees who have been transferred to new departments.
- **Deviants and isolates**—Those in a given group who hold a different position from the majority, as well as workers who are happy with the present situation, highly productive departments and workers, and loners of one sort or another.
- **"Pure" cases** or cases that show extreme examples of the conditions under study—The most unproductive departments, the most antagonistic workers, and so forth.
- **Those who fit well and those who do not**—The workers who are well established in their organizations versus those who are not, those executives who fully reflect management views and those who do not.
- **Those who represent different positions in the system**—Unskilled workers, assemblers, superintendents, and so forth.[9]

Jason and Myra plan to interview three managers during the early phase of their research for MindWriter: (1) the service facility, (2) the call center, and (3) the contract courier service. Their emphasis should be not only on what has been done in the past but

also on discovering the parameters of feasible change. They might want to expand their interviews to include long-term employees of the various departments, as their views are likely to be different from those of their managers. Because postpurchase service problems might be directly related to product design, expanding their experience survey to individuals associated with engineering and production should also be considered.

## Focus Groups

Originating in sociology, focus groups became widely used in marketing research during the 1980s and are used for increasingly diverse research applications today.[10] The most common application of focus group research continues to be in the consumer arena. However, many corporations are using focus group results for diverse exploratory applications.

The topical objective of a focus group is often a new product or product concept. The output of the session is a list of ideas and behavioral observations, with recommendations by the moderator. These are often used for later quantitative testing. As a group interview tool, focus groups have applied-research potential for other functional areas of business, particularly where the generation and evaluation of ideas or the assessment of needs is indispensable. In exploratory research, the qualitative data that focus groups produce may be used for enriching all levels of research questions and hypotheses and comparing the effectiveness of design options.

A **focus group** is a panel of people, led by a trained moderator, who meet for 90 minutes to 2 hours. The facilitator or moderator uses group dynamics principles to focus or guide the group in an exchange of ideas, feelings, and experiences on a *specific topic*. Typically the focus group panel is made up of 6 to 10 respondents. Too small or too large a group results in less effective participation. The facilitator introduces the topic and encourages the group to discuss it among themselves.

Following a topical guide, the moderator will steer the discussion to ensure that all the relevant information desired by the client is considered by the group. The facilitator also keeps gregarious individuals from dominating the conversation, ensuring that each person enters the discussion. In ideal situations, the group's discussion will proceed



This focus group facility at Maritz Marketing Research, Inc., has been designed to permit the research sponsor to observe participants and confer or adjust measurement questions while the research is in progress. www.maritz.com/mmri/

uninterrupted; however, if the discussion begins to lag, the facilitator moves it along by introducing another facet of the topic that the group has not yet considered. In some groups a questionnaire is administered to the participants before the group begins to gather additional data. Typically, one or more representatives of the client will sit behind a one-way mirror in the focus group room to observe the verbal and nonverbal interactions and responses of participants.

MindWriter could use focus groups involving employees (of the call center and service departments) to determine changes and provide an analysis of change ideas. It may want focus groups with customers (both dissatisfied and satisfied) to uncover what has occurred in their different experiences. In another application, when a large title insurance company was developing a computerized help system, it ran focus groups with its branch office administrators to discover their preferences for distributing files on the company's **intranet** (a company's proprietary network—behind a security "firewall" that limits access to authorized users only). In other cases, a small college used focus groups to develop a plan to attract more freshmen applications, and a blood center used a focus group to improve blood donations.[11]

**Homogeneity within the Focus Group** It is often preferable, depending on the topic, to run separate focus groups for different subsets of the population. For example, a study on nutritional advice may begin with separate consumer and physician focus groups to determine the best ways to provide the advice. This type of homogeneous grouping tends to promote more intense discussion and freer interaction.[12] For consumer groups, consideration should also be given to such factors as gender, ethnicity, employment status, and education. In a recent exploratory study of discount shoppers, the attitudes about the economy and personal finances expressed by East Coast respondents and West Coast respondents were widely divergent. The client sponsor was able to use this information to build a marketing strategy tailored to each geographic area.[13]

Since most focus groups are homogeneous, locating respondents for focus groups is usually done through informal networks of colleagues, community agencies, and the target group. Sometimes researchers advertise to attract a wider range of opinions.[14]

**Telephone Focus Groups** Traditional focus group participants meet face to face, usually in specialized facilities that enable respondents to interact in a comfortable setting while being observed by a sponsoring client. However, often there is a need to reach people that traditional focus groups cannot attract. With modern telephone conferencing facilities, telephone focus groups can be particularly effective in the following situations:




- When it is difficult to recruit desired participants—members of elite groups and hard-to-find respondents such as experts, professionals, physician-specialists, high-level executives, and storeowners.
- When target group members are rare, "low incidence," or widely dispersed geographically—directors of a medical clinic, celebrities, early adopters, and rural practitioners.
- When issues are so sensitive that anonymity is needed but respondents must be from a wide geographical area—people suffering from a contagious disease, people using nonmainstream products, high-income individuals, competitors.
- When you want to conduct only a couple of focus groups but want nationwide representation.

Telephone focus groups are usually less expensive than face-to-face focus groups—by up to 40 percent. In contrast to face-to-face groups, heterogeneous telephone groups can be productive. People in traditional superior-subordinate roles can be mixed as long as they are not from the same city. A telephone focus group is less likely to be effective under the following conditions:

MANAGEMENT Tip

- When participants need to handle a product.
- When an object of discussion cannot be sent through the mail in advance.
- When sessions will run long.
- When the participants are groups of young children.

**Online Focus Groups** An emerging technique for exploratory research is to approximate group dynamics using e-mail, websites, Usenet newsgroups, or an Internet chat room. Emerging technology also makes it possible to do "live" voice-chats online, reducing or eliminating the cost associated with telephone focus groups. Posting questions to a newsgroup with an interest in the research problem can generate considerable discussion. However, online discussions are not confidential unless they take place on an intranet. Although online forum discussions are unlikely to reflect the average participants, they can be a good way of getting in touch with populations that have special interests (e.g., BMW Club members, Little League coaches, or "power computer users").

**Videoconferencing Focus Groups** The third type of nonface-to-face focus group is conducted via videoconferencing. Many anticipate growth for this medium. Like telephone focus groups, videoconferencing enables significant savings. By reducing the travel time for the facilitator and the client, it means more focus groups can be accomplished in a shorter time. However, videoconferencing retains the barrier between the moderator and participants, although less so than telephone focus groups. Since large corporations and universities often have their own internal videoconferencing facilities, most videoconferencing focus groups will tend to occur within this setting.

*We discuss content analysis in Chapter 15.*

**Recording, Analysis, and Reporting** In face-to-face settings, some moderators use large sheets of paper to record trends on the wall of the focus group room; others use a personal notepad. Facility managers produce both video- and audiotapes to enable a full analysis of the interview. The recorded conversations and moderator notes are summarized across several focus group sessions using *content analysis*. This analysis provides the research sponsor with a qualitative picture of the respondents' concerns, ideas, attitudes, and feelings.

**Advantages and Disadvantages** The primary advantage of the focus group as an exploratory research tool is its ability to quickly and inexpensively grasp the core issues of a topic. Focus groups are brief, relatively inexpensive, and extremely flexible. They provide the manager, researcher, or client with a chance to observe reactions to their research questions in an open-ended group setting. Participants respond in their own words, rather than being force-fit into a formalized method. Because they can freely react to each other's responses, the unexpected often occurs.

Focus groups best enable the exploration of surprise information and new ideas. Agendas can be modified as the research team moves on to the next focus group. Even within an existing focus group, an adept facilitator can build on the ideas and insights of previous groups, getting to a greater depth of understanding. However, because they are qualitative devices, with limited sampling accuracy, results from focus groups should not be considered a replacement for quantitative analyses.



## Close-Up

### Qualitative Research with Children

Since the groundbreaking television perception studies of the 1970s, researchers with expertise in extracting information from children have been much in demand. One such researcher, Megan Nerz, senior partner of MLN Research (Raleigh, North Carolina), estimates that while there are numerous researchers who claim experience with children, there are only a handful of firms with true expertise. As a graduate assistant during the 1970s at the University of Hartford, Nerz participated in those early studies about the effects of television advertising on kids. She's been putting that early experience to use for more than 25 years for such clients as Kraft Foods, Nabisco, Oscar Mayer, LEGO, and the Walt Disney Company.

"Kids are wonderful to work with," claims Nerz. "They can be amusing, insightful, creative, tender, reluctant, antagonistic, withdrawn—all within the span of a few minutes. But they aren't just little adults, their cognitive skills and level of development are very specific to their age and where they are in school." Where you wouldn't worry about forming a focus group with adults of different ages, Nerz insists that in child research, focus groups should always be single-gender and members should never be further apart than one grade level or one year in age.

Qualitative research methodologies are often used with children, and while the names of some of those methods are familiar to those who conduct adult research, the procedures and techniques are different.

"When you work with adults, they have preconceived ideas and expectations of how to behave, what will happen, how they are expected to interact with the researcher and other participants. But children have no such expectations. And while you can often spend a considerable amount of time with an adult, with children your time is limited. Our children's focus groups will never be more than 1 hour and 15 minutes, so the researcher has to be extremely focused on the research objectives and on enticing the child to reveal their thoughts and impressions, their attitudes and concerns, in a very short period of time."

#### Recruiting: Mom as Gatekeeper

The process of screening and setting up a child research group has its own idiosyncrasies. The first rule of child research: You must deal with Mom. When trying to identify participants for a child focus group, the researcher first interviews the child's mother during the phone screening. Recruiters ask the mom about the child's ability to function in a group, ask her to describe the child's personality, to talk about how shy or outgoing the child is and whether he or she can express their opinions to others. "Often if the mom has more than one child in the target group, the recruiter will ask which of their children best matches the social characteristics we seek," explains Nerz. In the back of the researcher's mind is rule number two: You don't have time to get to know the child, so the child has to be receptive to having information "teased" from them, and be able to express how they feel. Screening continues with a phone conversation with the child. Rule number three evolves from that experience: If the child won't come to the phone, choose another child.

L&E Research (L&E), a focus group facility that MLN Research uses in Raleigh, North Carolina, recruits the participants for many of Nerz's focus groups. Adults involved in research are often recruited using purchased lists of households; in essence, the recruiting is blind. L&E takes a different approach and began building its own database of possible participants in 1990. When it needs a child of a certain gender, age, or year in school, it taps this database, which is organized by parent. Participants are recruited with periodic advertising or they can volunteer on the L&E website (see our text website for the sign-up procedure). As a result, the database is constantly updated and growing. "The turn-down rate is low," shares Tina Glover, a recruiting manager for L&E. "Parents are interested in giving their children an opportunity to participate, and to capture the $35 participation fee for their child." L&E also recruits members for child panels, whose participants are involved in up to three research-oriented activities in a single year and paid $25 each time.

#### The Pre-Warm-Up

While adults go through a reception procedure when arriving at a focus group facility, it takes little time and is designed to get them settled and ready to begin. "We always invite more children to the facility than we need for any given study," explains Glover, "expecting more scheduling or illness problems (with children as opposed to adults) which might cause last-minute cancellations." When they first started working with children, L&E had not expected the child's devastation when told that they wouldn't be needed that day for the research. "While adults, if dismissed, are happy to take their pay and go home, children take the release as rejection," describes Glover. When working with children, L&E now uses older, more comforting hostesses, who deliver the message to the dismissed children that they will be considered for the next group requiring children with their characteristics. "Children who are recruited for panels usually can't wait to participate again," claims Glover. "They see their involvement as their job.' But if we have drop-outs, those children who feel

uncomfortable and don't want to participate again, we turn to our database for a match."

## The Warm-Up

"With children, you have to alleviate concerns of Mom, so the warm-up is always in the presence of the parent," shared Nerz. "But we separate kids from moms as soon as possible, physically moving the parents to one end of the room. Kids need to feel comfortable with each other to be responsive. If we separate them from their parents, their natural inquisitiveness has them asking the other kids where they go to school, what they are interested in, and what video games or toys they have." The researcher has to set up expectations for the focus group with the child participant even to the point of breaking down one of Mom's rules: Don't say anything if you can't say something nice. "One job of the moderator during warm-up is to convince the child that it really is okay to tell us what they think and how they feel. They aren't going to hurt our feelings and we aren't going to get mad at them if they don't like something," claims Nerz. Some researchers believe all children are "pleasers," telling the researcher only what they believe the researcher wants to hear. Nerz disagrees. It's her experience that children can be painfully and brutally honest, creating some very uncomfortable moments for the client who is positioned behind the one-way mirror.

Adults have an image of a focus group as people sitting around a conference table talking. "Kids have tables, but they are appropriate for the child—no conference tables and no swivel chairs," shares Nerz. "If a child is roaming the room during a focus group, then the moderator has lost control." But as Nerz explains, what children are asked to do during a focus group, sometimes doesn't look like a focus group for an adult. Focus groups with young children, 6- to 8-year-olds, those with limited vocabulary because of their age and grade, often are asked to draw pictures to start the focus group. Then some time is spent with each child explaining their picture and what it tells about a trip to the grocery with Mom, or their favorite part of their house or bedroom. Older children, 11- to 12-year-olds, have better language skills. They might be provided a list of two dozen words and be asked to circle five words that describe how they feel about helping fix dinner. Older children also might be provided with images and words and be asked to create a collage. "You have to stimulate the child's creativity and cognitive skills before you can extract meaning," explains Nerz.

Children's focus groups are videotaped, as are those involving adults. And more and more, children's researchers employ FocusVision, where members of a client's management team observe the group as it takes place but via videoconferencing, often from their own offices in distant cities. "If parents won't permit videotaping, then the child is dismissed," explains Glover. "And parents can't watch the group from the observation room, either. There is too much strategy being discussed behind that one-way mirror."

## Other Child-Research Techniques

A **creativity session** involves an initial phone screening, followed by a face-to-face screening with the child and a hands-on creative exercise. Usually 10 youngsters are screened to a group of four. These four are brought to an activity room, where they are encouraged to find their own special space. This may be at a table, outside on a picnic bench, on the floor in a hallway, even under a table. Child-appropriate snacks and drinks are provided, and the child is free to snack and move around during the research. The creative exercise usually takes 20–30 minutes, followed by a "building" exercise in which the four participants build on each other's ideas. This session can be an hour or more. "Children are wonderfully creative. They are unhampered by expectations. If we've done our job correctly, kids will reveal many things that adults won't," enthuses Nerz.

**Observational playgroups** involve observing children at play, with targeted toys or materials, usually behind one-way mirrors. **Children's panels** involve focus group activities where the same child may participate in up to three groups in a year, with each experience several months apart. "With children, something that happened in January is ancient history by June. So even if they have participated before, they have fuzzy recollections of what happened," explains Nerz. **Paired-interviews** involve two children with a moderator, either friendship-pairs or straight-pairs (children who don't know each other ahead of time). In this 45–60 minute interview, researchers track thoughts, experiences, and processes. **Depth interviews,** where researchers talk one-on-one with a child, can last an hour. One technique, **ethnographic research,** is growing in use. "I've taken pairs of preteen girls shopping for clothing and cosmetics at a mall, been to a video arcade with young boys, and done a grocery store ethnography with older girls. But 'home ethnographies' may be the most fun. You can do it with children as young as three, where shopping ethnographies are usually reserved for those nine or older. In the home you can explore how and why they decorate their rooms, what they carry in their backpacks, what foods they like to eat or cook, how they use personal or kitchen appliances, what they collect, even how they organized their closets," shares Nerz.

## Strategic Decision Making

Children are involved in helping advertisers create child-involving messages by reacting to storyboards for television commercials. (Storyboards arrange the scenes of a commercial in comic strip–like panels, with dialogue and special effects noted beneath each panel.) "Unlike adults, children do better with storyboards than with the more expensive

Observational playgroups involve observing children at play, with targeted toys or materials, usually behind one-way mirrors.




videomatics or animatics (semiproduced commercials using slides or slides transitioning on video); this can save the client time and money," shares Nerz. MLN Research has also studied how children use the Internet, their reaction to visual concept boards for products (What would Mom think? Would you want this product? How would you use this product? Would your friends have one?), their reaction to packaging prototypes and changes, taste changes being considered, and insight on brand association, imagery, and brand equity.

But working with kids isn't all fun and games. Children's research has to take place after school, during school breaks, or on weekends. Some evening research involves older children, but even those activities are usually over by 8:00 P.M. And sometimes all your best-laid plans can go awry. "Sometimes they get sick, or have a fight with their mom on the way to the research facility, or maybe they have a bad day at school. Kids can't filter out experiences, environmental stimuli, or physical symptoms of unease the way adults can." Which leads Nerz to her last rule of children's research: Be prepared for anything.

Source: This material was developed from interviews with Megan Nerz, MLN Research; Ed Eggers, L&E Research; and Tina Glover, L&E Research during September 2001.

## Two-Stage Design

A useful way to design a research study is as a **two-stage design.** With this approach, exploration becomes a separate first stage with limited objectives: (1) clearly defining the research question and (2) developing the research design.

In arguing for a two-stage approach, we recognize that much about the problem is not known but should be known before effort and resources are committed. In these circumstances, one is operating in unknown areas, where it is difficult to predict the problems and costs of the study. Proposals that acknowledge the practicality of this approach are particularly useful when the research budget is inflexible. A limited exploration for a specific, modest cost carries little risk for both sponsor and researcher and often uncovers information that reduces the total research cost.

MANAGEMENT Tip

An exploratory study is finished when the researchers have achieved the following:

- Established the major dimensions of the research task.
- Defined a set of subsidiary investigative questions that can be used as guides to a detailed research design.
- Developed several hypotheses about possible causes of a management dilemma.
- Learned that certain other hypotheses are such remote possibilities that they can be safely ignored in any subsequent study.
- Concluded additional research is not needed or is not feasible.

## SNAPSHOT

Kool-Aid Regains Its Smile

What do you do when a venerable brand enjoying 100 percent awareness among moms and kids starts losing sales—even when it's still selling 500 million gallons per year? You call Sun Research Corp. (SRC) to reveal a strategy to stop the decline. SRC moderated 11 focus groups. Participants for each group were chosen to represent a market segment based on product usage. The focus groups revealed that heavy Kool-Aid users (those who use Kool-Aid at least 12 times a year) "aren't content to just add water to their Kool-Aid powder . . . [but] customize Kool-Aid by adding oranges, grapes, pineapples, fruit juice, and club soda. They also drink Kool-Aid year-round, and all family members drink it—it's not perceived as a beverage just for kids. In contrast, light/lapsed users are more likely to head out of the house for socializing."

A second round of five focus groups involving African-American households defined as heavy users and six more involving general market and light/lapsed users were conducted by MLN Research (North Carolina), Mindy Goldberg & Associates (Philadelphia), and Marketing Resources (Maryland) to test the resulting ad campaigns. The heavy-user ad campaign, sporting the tagline "How do you like your Kool-Aid?" generated a 3 percent rise in sales among African-American households. A second campaign, for general and light/lapsed users featuring Kool-Aid consumed from a portable thermos at a dog wash fund-raiser, helped generate a 2 percent sales rise in the overall market. The makers of Kool-Aid were all smiles at their 2.7 percent increase in market share during 2000.

**www.kraftfoods.com/kool-aid**

**www.mlnresearch.com**

## Descriptive Studies

In contrast to exploratory studies more formalized studies are typically structured with clearly stated hypotheses or investigative questions. Formal studies serve a variety of research objectives:

1. Descriptions of phenomena or characteristics associated with a subject population (the *who, what, when, where,* and *how* of a topic).
2. Estimates of the proportions of a population that have these characteristics.
3. Discovery of associations among different variables.

The third study objective is sometimes labeled a *correlational study*, a subset of descriptive studies. A descriptive study may be simple or complex; it may be done in many settings. Whatever the form, a descriptive study can be just as demanding of research skills as the causal study, and we should insist on the same high standards for design and execution.

***The BankChoice example was first introduced in Chapter 3.***

The simplest descriptive study concerns a univariate question or hypothesis in which we ask about, or state something about, the size, form, distribution, or existence of a variable. In the account analysis at BankChoice, we might be interested in developing a profile of savers. We first may want to locate them in relation to the main office. The question might be, "What percentage of the savers live within a two-mile radius of the office?" Using the hypothesis format, we might predict, "60 percent or more of the savers live within a two-mile radius of the office."

We may also be interested in securing information about other variables, such as the relative size of accounts, the number of accounts for minors, the number of accounts opened within the last six months, and the amount of activity (number of deposits and withdrawals per year) in accounts. Data on each of these variables, by themselves, may have value for management decisions. Bivariate relationships between these or other variables may be of even greater interest. Cross-tabulations between the distance from the account owner's residence or employment to the branch and account activity may

suggest that differential rates of activity are related to account owner location. A cross-tabulation of account size and gender of account owner may also show interrelation. Such findings do not imply a causal relationship. In fact, our task is to determine if the variables are independent (or unrelated) and if they are not, then to determine the strength or magnitude of the relationship. Neither procedure tells us which variable is the cause. For example, we might be able to conclude that gender and account size are related but not that gender is a causal factor in account size.

Descriptive studies are often much more complex than this example. One study of savers began as described and then went into much greater depth. Part of the study included an observation of account records that revealed a concentration of nearby savers. Their accounts were typically larger and more active than those whose owners lived at a distance. A sample survey of savers provided information on stages in the family life cycle, attitudes toward savings, family income levels, and other matters. Correlation of this information with known savings data showed that women owned larger accounts. Further investigation suggested that women with larger accounts were often widowed or working single women who were older than the average account holder. Information about their attitudes and savings practices led to new business strategies at the bank.

Some evidence collected led to causal questions. The correlation between nearness to the office and the probability of having an account at the office suggested the question, "Why would people who live far from the office have an account there?" In this type of question a hypothesis makes its greatest contribution by pointing out directions that the research might follow. It might be hypothesized that

1. Distant savers (operationally defined as those with addresses more than two miles from the office) have accounts at the office because they once lived near the office; they were "near" when the account decision was made.
2. Distant savers actually live near the office, but the address on the account is outside the two-mile radius; they are "near," but the records do not show this.
3. Distant savers work near the office; they are "near" by virtue of their work location.
4. Distant savers are not normally near the office but responded to a promotion that encouraged savers to bank via computer; this is another form of "nearness" in which this concept is transformed into one of "convenience."

When these hypotheses were tested, it was learned that a substantial portion of the distant savers could be accounted for by hypotheses 1 and 3. The conclusion: Location was closely related to saving at a given association. The determination of cause is not so simple, however, and these findings still fall within the definition of a descriptive study.

MindWriter could benefit from a descriptive study that profiles satisfied service customers versus dissatisfied ones. Service customer characteristics could then be matched with specific types of service problems, which could lead to identifying changes in product design or customer service policies.

## Causal Studies

The correlation between location and probability of account holding at BankChoice looks like strong evidence to many, but the researcher with scientific training will argue that correlation is not causation. Who is right? The essence of the disagreement seems to lie in the concept of cause.

## The Concept of Cause

One writer asserts, "There appears to be an inherent gap between the language of theory and research which can never be bridged in a completely satisfactory way. One thinks in terms of theoretical language that contains notions such as causes, forces, systems, and properties. But one's tests are made in terms of covariations, operations, and pointer readings."[15] The essential element of **causation** is that *A "produces" B* or *A "forces" B* to occur. But that is an artifact of language, not what happens. Empirically, we can never demonstrate an *A-B* causality with certainty. This is because we do not "demonstrate" such causal linkages deductively or use the form or validation of premises that deduction requires for conclusiveness. Unlike deductive syllogisms, empirical conclusions are inferences—inductive conclusions. As such, they are probabilistic statements based on what we observe and measure. But we cannot observe and measure all the processes that may account for the *A-B* relationship.

*You may find it valuable to refer to Exhibit 2–2 as you read this section.*

In Chapter 2 we discussed the example of sales failing to increase following a promotion. Having ruled out other causes for the flat sales, we were left with one inference that was probably *but not certainly* the cause: a poorly executed promotion.

Meeting the ideal standard of causation requires that one variable always causes another and no other variable has the same causal effect. The *method of agreement*, proposed by John Stuart Mill in the nineteenth century, states, "When two or more cases of a given phenomenon have one and only one condition in common, then that condition may be regarded as the cause (or effect) of the phenomenon."[16] Thus, if we can find *Z* and only *Z* in every case where we find *C*, and no others (*A*, *B*, *D*, or *E*) are found with *Z*, then we can conclude that *C* and *Z* are causally related. Exhibit 6–2 illustrates this method.

An example of the method of agreement might be the problem of occasional high absenteeism on Mondays in a factory. A study of two groups with high absenteeism (No. 1 and No. 2 in Exhibit 6–2) shows no common job, department, demographic, or personal characteristics (*A*, *B*, *D*, and *E*). However, membership in a camping club (*C*) is common across both groups. The conclusion is that club membership is associated with high absenteeism (*Z*).

The method of agreement helps rule out some variables as irrelevant. In Exhibit 6–2, *A*, *B*, *D*, and *E* are unlikely to be causes of *Z*. However, there is an implicit assumption that there are no variables to consider other than *A*, *B*, *C*, *D*, and *E*. One can never accept this supposition with certainty because the number of potential variables is infinite. In addition, while *C* may be the cause, it may instead function only in the presence of some other variable not included.

**EXHIBIT 6–2 Mill's Method of Agreement**

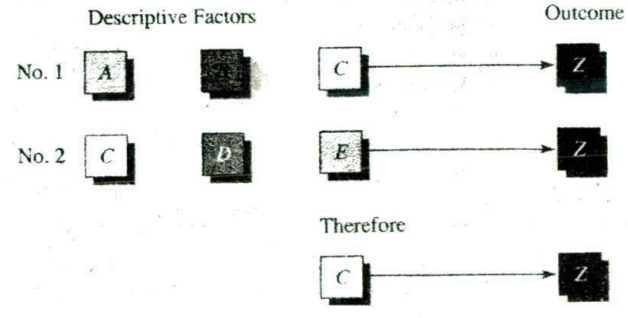
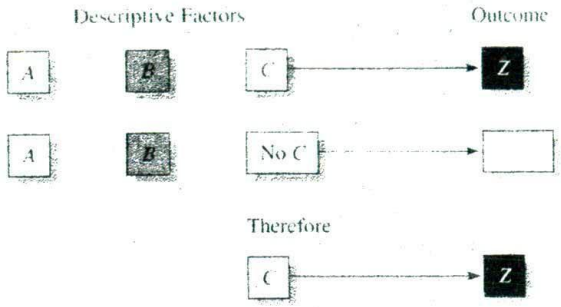


**EXHIBIT 6–3 Mill's Method of Difference**



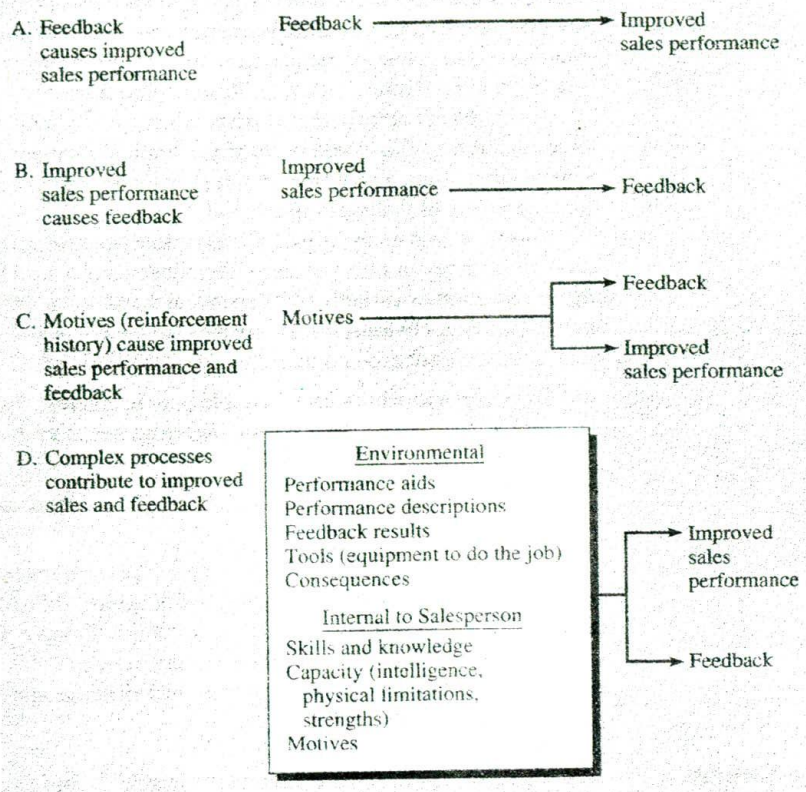

The *negative canon of agreement* states that where the absence of *C* is associated with the absence of *Z*, there is evidence of a causal relationship between *C* and *Z*. Together with the method of agreement, this forms the basis for the *method of difference:* "If there are two or more cases, and in one of them observation *Z* can be made, while in the other it cannot; and if variable *C* occurs when observation *Z* is made, and does not occur when observation *Z* is not made; then it can be asserted that there is a causal relationship between *C* and *Z*."[17]

Using our MindWriter example, if Jason and Myra were to discover that a particular servicing problem repeatedly occurred only when a single employee was involved in the servicing of customers' laptops and never when that employee was absent, an assumption of causation might be made. The method of difference is illustrated in Exhibit 6–3. Although these methods neither ensure discovery of all relevant variables nor provide certain proof of causation, they help advance our understanding of causality by eliminating inadequate causal arguments.[18]

A more refined cause-and-effect model proposes that individual variables are not the cause of specific effects but that processes are the cause of processes.[19] Evidence for this position is illustrated in Exhibit 6–4. Here various cause-and-effect relationships between sales performance and feedback clarify the differences between simple and more complex notions of causality.[20]

In model A, we contend that feedback causes an increase in sales performance. An equally plausible explanation is shown in model B: Improvement in sales performance causes the salesperson to behave in a proactive way, seeking more feedback to apply to the next experience. Model C suggests the reinforcement history of the salesperson is the cause of both initiation of self-administered feedback and working harder to improve performance. In model D, we suggest that complex processes contribute to changes in feedback and performance. They are in the salesperson's environment and unique to the person. Other examples could show how positive versus negative reinforcement could create upward or downward sequences that would affect both feedback and performance. Yet all of them make predictions about presumed causal relationships among the variables. Contemporary authors describe the way researchers substitute "prediction" for "causation." When scientists speak of "causation," they are often referring to a kind of prediction. Predictions can be considered to reflect cause only when all the relevant information is considered. Of course, we can never know all the relevant information, so our predictions are consequentially presumptive. Hence the disillusionment in science with the concept of cause. Scientists do use the word "cause" from time to time, but do not be misled into thinking that they mean "cause" in the absolute sense.[21]

**EXHIBIT 6–4 Possible Causal Models of Improved Sales Performance and Feedback**




Causal inferences are going to be made. Although they are neither permanent nor universal, they allow us to build knowledge of presumed causes over time. Such empirical conclusions provide us with successive approximations to the truth. Recognizing this caveat, let's look further at the types of causal relationships of interest to business researchers.

## Causal Relationships

Our concern in causal analysis is with how one variable affects, or is "responsible for," changes in another variable. The stricter interpretation of causation, found in experimentation, is that some external factor "produces" a change in the dependent variable. In business research, we often find that the cause-effect relationship is less explicit. We are more interested in understanding, explaining, predicting, and controlling relationships between variables than we are in discerning causes.

If we consider the possible relationships that can occur between two variables, we can conclude there are three possibilities:

- Symmetrical
- Reciprocal
- Asymmetrical[22]

A **symmetrical relationship** is one in which two variables fluctuate together but we assume the changes in neither variable are due to changes in the other. Symmetrical conditions are most often found when two variables are alternate indicators of another cause or independent variable. We might conclude that a correlation between low work attendance and active participation in a company camping club is the result of (dependent on) another factor, such as a lifestyle preference.

A **reciprocal relationship** exists when two variables mutually influence or reinforce each other. This could occur if the reading of an advertisement leads to the use of a brand of product. The usage, in turn, sensitizes the person to notice and read more of the advertising of that particular brand.

Most research analysts look for **asymmetrical relationships.** With these we postulate that changes in one variable (the independent variable, or *IV*) are responsible for changes in another variable (the dependent variable, or *DV*). The identification of the *IV* and *DV* is often obvious, but sometimes the choice is not clear. In these latter cases we evaluate independence and dependence on the basis of:

1. The degree to which each variable may be altered. The relatively unalterable variable is the independent variable *(IV)* (e.g., age, social status, present manufacturing technology).
2. The time order between the variables. The independent variable *(IV)* precedes the dependent variable *(DV)*.

Exhibit 6–5 describes the four types of asymmetrical relationships: stimulus-response, property-disposition, disposition-behavior, and property-behavior. Experiments usually involve stimulus-response relationships. Property-disposition relationships are often studied in business and social science research. Much of ex post facto research involves relationships between properties, dispositions, and behaviors.

## Testing Causal Hypotheses

MANAGEMENT




While no one can ever be certain that variable *A* causes variable *B* to occur, one can gather some evidence that increases the belief that *A* leads to *B*. In testing causal hypotheses, we seek three types of evidence:

1. Covariation between *A* and *B*.
   - Do we find that *A* and *B* occur together in the way hypothesized?
   - When *A* does not occur, is there also an absence of *B*?
   - When there is more or less of *A*, does one also find more or less of *B*?
2. Time order of events moving in the hypothesized direction.
   - Does *A* occur before *B*?
3. No other possible causes of *B*.
   - Can one determine that *C*, *D*, and *E* do not covary with *B* in a way that suggests possible causal connections?

**Causation and Experimental Design** In addition to these three conditions, successful inference-making from experimental designs must meet two other requirements. The first is referred to as **control.** All factors, with the exception of the independent variable, must be held constant and not confounded with another variable that is not part of the study. Second, each person in the study must have an equal chance for exposure to each level of the independent variable. This is **random assignment** of subjects to groups.

Here is a demonstration of how these factors are used to detect causation. Assume you wish to conduct a survey of York College's alumni to enlist their support for a new

**EXHIBIT 6–5 Four Types of Asymmetrical Causal Relationships**

| Relationship Type | Nature of Relationship | Examples |
|---|---|---|
| Stimulus-response | An event or change results in a response from some object. | • A change in work rules leads to a higher level of worker output.<br>• A change in government economic policy restricts corporate financial decisions.<br>• A price increase results in fewer unit sales. |
| Property-disposition | An existing property causes a disposition. | • Age and attitudes about saving.<br>• Gender and attitudes toward social issues.<br>• Social class and opinions about taxation. |
| Disposition-behavior | A disposition causes a specific behavior. | • Opinions about a brand and its purchase.<br>• Job satisfaction and work output.<br>• Moral values and tax cheating. |
| Property-behavior | An existing property causes a specific behavior. | • Stage of the family life cycle and purchases of furniture.<br>• Social class and family savings patterns.<br>• Age and sports participation. |

Definitions: A *stimulus* is an event or force (e.g., drop in temperature, crash of stock market, product recall, or explosion in factory). A *response* is a decision or reaction. A *property* is an enduring characteristic of a subject that does not depend on circumstances for its activation (e.g., age, gender, family status, religious affiliation, ethnic group, or physical condition). A *disposition* is a tendency to respond in a certain way under certain circumstances (e.g., attitudes, opinions, habits, values, and drives). A *behavior* is an action (e.g., consumption practices, work performance, interpersonal acts, and other kinds of performance).

program. There are two different appeals, one largely emotional and the other much more logical in its approach. Before mailing out appeal letters to 50,000 alumni, you decide to conduct an experiment to see whether the emotional or the rational appeal will draw the greater response. You choose a sample of 300 names from the alumni list and divide them into three groups of 100 each. Two of these groups are designated as experimental groups. One gets the emotional appeal and the other gets the logical appeal. The third group is the **control group** and it receives no appeal.

Covariation in this case is expressed by the percentage of alumni who respond in relation to the appeal used. Suppose 50 percent of those who receive the emotional appeal respond, while only 35 percent of those receiving the logical appeal respond. Control group members, unaware of the experiment, respond at a 5 percent rate. We would conclude that using the emotional appeal enhances response probability.

The time sequence of events was not a problem. There could be no chance that the alumni support led to sending the letter requesting support. However, have other variables confounded the results? Could some factor other than the appeal have produced the same results? One can anticipate that certain factors are particularly likely to confound the results. One can control some of these to ensure they do not have this

confounding effect. If the question studied is of concern only to alumni who attended the university as undergraduates, those who only attended graduate school are not involved. Thus, you would want to be sure the answers from the latter group did not distort the results. Control would be achieved by excluding graduate students.

A second approach to control uses **matching.** There might be reason to believe that different ratios of alumni support will come from various age groups. To control by matching, we need to be sure the age distribution of alumni is the same in all groups. In a similar way, control could be achieved by matching alumni from engineering, liberal arts, business, and other schools.

Even after using such controls, however, one cannot match or exclude other possible confounding variables. These are dealt with through random assignment.

**Randomization** is the basic method by which equivalence between experimental and control groups is determined. Experimental and control groups must be established so that they are equal. Matching and controlling are useful, but they do not account for all unknowns. It is best to assign subjects to either experimental or control groups at random (this is not to say haphazardly—randomness must be secured in a carefully controlled fashion according to strict rules of assignment). If the assignments are made randomly, each group should receive its fair share of different factors. The only deviation from this fair share would be that which results from random variation (luck of the draw). The possible impact of these unknown extraneous variables on the dependent variables should also vary at random. The researcher, using tests of statistical significance, can estimate the probable effect of these chance variations on the *DV* and can then compare this estimated effect of extraneous variation to the actual differences found in the *DV* in the experimental and control groups.

We emphasize that random assignment of subjects to experimental and control groups is the *basic technique* by which the two groups can be made equivalent. Matching and other control forms are supplemental ways of improving the quality of measurement. In a sense, matching and controls reduce the extraneous "noise" in the measurement system and in this way improve the sensitivity of measurement of the hypothesized relationship.

**Causation and Ex Post Facto Design** Prior to the incidents following September 11, 2001, researchers at the Centers for Disease Control (CDC) in Atlanta did not have the ability to determine whether anthrax spores delivered via a letter carried by the United States Postal Service (USPS) would be capable of causing inhalation anthrax. Contraction of inhalation anthrax, a fatal disease, was considered possible only if one were exposed to a large concentration of spores. A research design involving the assignment of people to two groups—one to receive anthrax spores via letter and one to receive no exposure to anthrax spores—to test a hypothesis relating to the consequences of such exposure was unrealistic. After several deaths resulting from such suspicious mail deliveries, causation was assumed. However, the CDC could not link at least one inhalation anthrax death to the USPS handling of a suspicious letter. Does this mean that the causation conclusion of the CDC drawn from examination of the facts collected after the deaths—that one or more letters contaminated with anthrax spores caused the deaths of several individuals—cannot be supported?

Most research studies cannot be carried out experimentally by manipulating variables. Yet we still are interested in the question of causation. Instead of manipulating and/or controlling exposure to an experimental variable, we study subjects who have been exposed to the independent factor and those who have not.

Consider the situation in which several workers in a plant have developed a pattern of absenteeism on Mondays. In searching for hypotheses to explain this phenomenon,

**EXHIBIT 6–6 Data on Employee Absenteeism**

| | Camping Club Member | |
|---|---|---|
| Absences | Yes | No |
| High | 40 | 70 |
| Low | 10 | 280 |

we discover that some of these workers are members of a camping club formed a few months ago. Could it be that membership in the club has caused increased absenteeism? It is not practical to set up an experiment. This would require us to assign persons to join the club and then determine whether this affects their work attendance.

The better approach would be to get the list of the club's membership and review the absence record of workers, concentrating on their record of work attendance on the Mondays after a camping event. We would also take a sample of employees who are not members of the club and calculate their Monday absence rates. The results might look something like those found in Exhibit 6–6. The data suggest that membership in the camping club might be a cause of higher Monday absenteeism. Certainly the covariation evidence is consistent with this conclusion. But what other evidence will give us an even greater confidence in our conclusion?

We would like some evidence of the time order of events. It is logical to expect that if club membership causes higher absenteeism, there will be a temporal relationship. If high absenteeism were found only on the Monday immediately following a camping trip, it would be good evidence in support of our hypothesis. If absences from work occur *before* the camping trip occurs, the time order does not support our hypothesis as well.

Of course, many other factors could be causing the high absenteeism among the club members. Here again, the use of control techniques will improve our ability to draw firm conclusions. First, in drawing a sample of nonmembers of the club, we can choose a random sample from the files of all employees. In this way, we can be more confident of a fair representation of average worker absence experiences.

*More will be said about the analysis of cross-tabulation and the interpretation of relationships in Chapter 16.*

We cannot use assignment of subjects in ex post facto research as we did in experimentation. However, we can gather information about potentially confounding factors and use these data to make cross-classification comparisons; in this way we can determine whether there is a relationship between club membership, absenteeism, and other factors. Assume we also gather age data on the employees under study and introduce this as a cross-classification variable; the results might look like those in Exhibit 6–7. These data suggest age is also a factor. Younger people are more likely to be among the high absentees. Part of the high absenteeism rate among club members seems to be

**EXHIBIT 6–7 Cross-Tabulated Data on Employee Absenteeism**

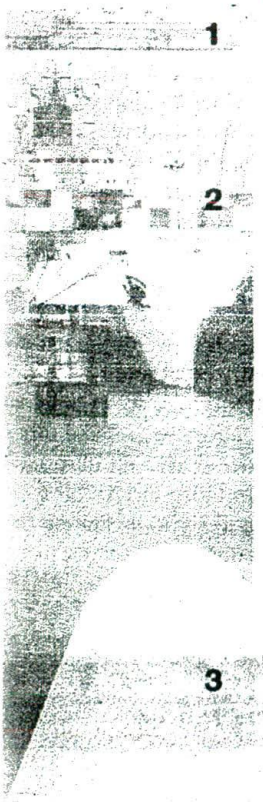
| | Club Member | | Nonclub Member | |
|---|---|---|---|---|
| Age | High Absentee | Low Absentee | High Absentee | Low Absentee |
| Under 30 years | 36 | 6 | 30 | 48 |
| 30 to 45 | 4 | 4 | 35 | 117 |
| 45 and over | 0 | 0 | 5 | 115 |

associated with the fact that most club members are under 30 years of age. Within age groups, it is also apparent that club members have a higher incidence of excessive absenteeism than nonmembers of the same age.

**The Post Hoc Fallacy** While researchers must necessarily use ex post facto research designs to address causal questions, a word of warning is in order. Club membership among persons with high absentee records is weak evidence for claiming a causal relationship. Similarly, the covariation found between variables must be interpreted carefully when the relationship is based on ex post facto analysis. The term *post hoc fallacy* has been used to describe these frequently unwarranted conclusions.

The ex post facto design is widely used in business research and often is the only approach feasible. In particular, one seeks causal explanations between variables that are impossible to manipulate. Not only can the variables not be manipulated, but the subjects usually cannot be assigned to treatment and control groups in advance. We often find that there are multiple causes rather than one. Be careful using the ex post facto design with causal reasoning. Thorough testing, validating of multiple hypotheses, and controlling for confounding variables are essential.

## SUMMARY



1 If the direction of a research project is not clear, it is often wise to follow a two-step research procedure. The first stage is exploratory, aimed at formulating hypotheses and developing the specific research design. The general research process contains three major stages: (1) exploration of the situation, (2) collection of data, and (3) analysis and interpretation of results.

2 A research design is the strategy for a study and the plan by which the strategy is to be carried out. It specifies the methods and procedures for the collection, measurement, and analysis of data. Unfortunately, there is no simple classification of research designs that covers the variations found in practice. Some major descriptors of designs are

- Exploratory versus formalized.
- Observational versus interrogation/communication.
- Experimental versus ex post facto.
- Descriptive versus causal.
- Cross-sectional versus longitudinal.
- Case versus statistical.
- Field versus laboratory versus simulation.
- Subjects perceive no deviations, some deviations, or researcher-induced deviations.

3 Exploratory research is appropriate for the total study in topic areas where the developed data are limited. In most other studies, exploration is the first stage of a project and is used to orient the researcher and the study. The objective of exploration is the development of hypotheses, not testing.

Formalized studies, including descriptive and causal, are those with substantial structure, specific hypotheses to be tested, or research questions to be answered. Descriptive studies are those used to describe phenomena associated with a subject population or to estimate proportions of the population that have certain characteristics.



Causal studies seek to discover the effect that a variable(s) has on another (or others) or why certain outcomes are obtained. The concept of causality is grounded in the logic of hypothesis testing, which, in turn, produces inductive conclusions. Such conclusions are probabilistic and thus can never be demonstrated with certainty. Current ideas about causality as complex processes improve our understanding over Mill's canons, though we can never know all the relevant information necessary to prove causal linkages beyond a doubt.

The relationships that occur between two variables may be symmetrical, reciprocal, or asymmetrical. Of greatest interest to the research analyst are asymmetrical, relationships, which may be classified as any of the following types:

- Stimulus response
- Property-disposition
- Disposition-behavior
- Property-behavior

We test causal hypotheses by seeking to do three things. We (1) measure the covariation among variables, (2) determine the time order relationships among variables, and (3) ensure that other factors do not confound the explanatory relationships.

The problems of achieving these aims differ somewhat in experimental and ex post facto studies. Where possible, we try to achieve the ideal of the experimental design with random assignment of subjects, matching of subject characteristics, and manipulation and control of variables. Using these methods and techniques, we measure relationships as accurately and objectively as possible.

## KEY TERMS

asymmetrical relationship 166
case study 150
causal study 149
causation 163
children's panels 159
control 166
control group 167
creativity session 159
cross-sectional study 149
depth interview 159
descriptive study 149
ethnographic research 159
ex post facto design 149
experience survey 154
experiment 149
exploratory study (exploration) 146
field conditions 150
focus group 155
formal study 146
interrogation/communication study 147
intranet 156
laboratory conditions 150
longitudinal study 149
matching 168
monitoring 147
observational playgroups 159
paired-interviews 159
participants' perceptions 151
primary data 152
qualitative techniques 151
random assignment 166
randomization 168
reciprocal relationship 166
research design 146
secondary data 152
simulations 150
statistical study 150
symmetrical relationship 166
two-stage design 160

## EXAMPLES

| Company | Scenario | Page |
|---|---|---|
| Audience Selection, Ltd. | Conducted the second round of phone interview in the Global Entrepreneurship Monitor (GEM) study. | 148 |
| BankChoice* | A descriptive study of account owners' activity to develop new strategies for targeting large, active accounts. | 161 |

| | | |
|---|---|---|
| Catalyst, Inc. | The nonprofit research organization charged with executing the court-ordered multistage research study in the Smith Barney sexual harrassment case. | 153 |
| Centers for Disease Control | Using an ex post facto design to determine causation of inhalation anthrax contamination at the USPS. | 168 |
| Copper Industry Association* | A study of the outlook of the copper industry in the next 10 years. | 153 |
| FieldSource | A program used to create a custom-selected opt-in panel used to provide quick, cost-effective samples; draws samples from 3 million participants from various demographic and lifestyle groups. | 148 |
| Global Entrepreneurship Monitor (GEM) | A longitudinal design causal study to identify government policies that foster entrepreneurship. | 148 |
| John Deere and Company | A manufacturer of construction and agriculture equipment conducting both quantitative and qualitative studies to understand its environment. | 149 |
| Kraft Foods | Used a two-stage design study to develop the sales stimulus ad campaign for Kool-Aid. | 161 |
| L&E Research | Recruits child participants for focus groups and other research studies. | 158 |
| Maritz Marketing Research, Inc. | Conducts focus groups in specially designed facilities that permit observation by the research sponsor. | 155 |
| Market Facts, Inc. | Conducted the first round of phone interviews in the Global Entrepreneurship Monitor (GEM) study. | 148 |
| Marketing Resources | Conducted ad testing in the Kool-Aid study for Kraft Foods. | 161 |
| MindWriter* | A study design for evaluation of CompleteCare satisfaction. | Throughout |
| Mindy Goldberg & Associates | Conducted concept testing and ad testing in the Kool-Aid study. | 161 |
| MLN Research | Conducted focus groups to test the communication elements of the Kool-Aid ad campaign. Also conducts focus groups, creative play sessions, and other research techniques involving children. | 158, 161 |
| Office of Industry Analysis* | A study to determine if executives would reveal what criteria they use when one raw material is substituted for another in manufacturing. | 151 |
| Smith Barney | The investment and financial services firm, ordered to do attitudinal research as part of the negotiated settlement of the sexual harassment suit brought by 25 current and former employees. | 153 |
| StarAuto* | An exploratory study experience survey to determine sources of declining productivity and quality. | 154 |
| Sun Research Corp. | Conducted 11 focus groups in the Kool-Aid study. | 161 |
| U.S. Postal Service | Attempting to determine the source of workers' exposure to inhalation anthrax. | 168 |

| | | |
|---|---|---|
| York College* | A causal study to determine the power of emotional versus rational appeal on financial contributions to a new program. | 166 |

*Due to the confidential and proprietary nature of most research, the names of some companies have been changed.

## DISCUSSION QUESTIONS

### Terms in Review

1. Distinguish between the following:
   a. Exploratory and formal studies.
   b. Experimental and ex post facto research designs.
   c. Descriptive and causal studies.
2. Establishing causality is difficult, whether conclusions have been derived inductively or deductively.
   a. Explain and elaborate on the implications of this statement.
   b. Why is ascribing causality more difficult when conclusions have been reached through induction?
   c. Correlation does not imply causation. Illustrate this point with examples from business.
3. Using yourself as the subject, give an example of each of the following asymmetrical relationships:
   a. Stimulus-response
   b. Property-disposition
   c. Disposition-behavior
   d. Property-behavior
4. Why not use more control variables rather than depend on randomization as the means of controlling extraneous variables?
5. Researchers seek causal relationships by either experimental or ex post facto research designs.
   a. In what ways are these two approaches similar?
   b. In what ways are they different?

### Making Research Decisions

6. You have been asked to determine how hospitals prepare and train volunteers. Since you know relatively little about this subject, how will you find out? Be as specific as possible.
7. You are the administrative assistant for a division chief in a large holding company that owns several hotels and theme parks. You and the division chief have just come from the CEO's office, where you were informed that the guest complaints related to housekeeping and employee attitude are increasing. Your on-site managers have mentioned some tension among the workers but have not considered it unusual. The CEO and your division chief instruct you to investigate. Suggest at least three different types of research that might be appropriate in this situation.
8. Propose one or more hypotheses for each of the following variable pairs, specifying which is the *IV* and which is the *DV*. Then develop the basic hypothesis to include at least one moderating variable or intervening variable.
   a. The Index of Consumer Confidence and the business cycle.
   b. Level of worker output and closeness of worker supervision.
   c. Student GPA and level of effort in a class required by student's major.

**Bringing Research to Life**

9. Using the eight design descriptors, profile the MindWriter CompleteCare satisfaction study as described in this and preceding chapters.

**From Concept to Practice**

10. Use the eight design descriptors in Exhibit 6–1 to profile the research described in the chapter Snapshots.

**WWW Exercises**

Visit our website for Internet exercises related to this chapter at www.mhhe.com/business/cooper8

## CASES

**A GEM OF A STUDY**

**CALLING UP ATTENDANCE**

**GOODYEAR'S AQUATRED**

**INQUIRING MINDS WANT TO KNOW—NOW!**

**JOHN DEERE AND COMPANY**

**RAMADA DEMONSTRATES ITS PERSONAL BEST**

**VOLKSWAGEN'S BEETLE**

*All cases indicating a video icon are located on the Instructor's Videotape Supplement. All nonvideo cases are in the case section of the textbook. All cases indicating a CD icon offer a data set, which is located on the accompanying CD.

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