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Preface

The purpose of this book is to help you understand the basics of research and to make you a more knowledgeable consumer of research. In fact, after reading this book and participating in an introductory research class, you should be able to conduct simple projects on your own or with just a little outside help.

There are many types of research projects you can do on your own. You can do informal research. You can carry out simple telephone surveys. You can set up and analyze basic databases and calculate percentages and averages in your spreadsheet. Knowing the jargon of research — which includes such terms as "mean," "median," "random," and "longitudinal study" — will help you understand reports and communicate with your research director or consultant. With this knowledge, those researchers also will lose their "priest-like" status.

Many of the concepts in this book also can be applied to work and life even if you are not conducting a research project. For example, a knowledge of random selection methods can help you make decisions about how to assign offices or select employees for tasks. You will have a better understanding of polls that are taken during an election season and of research that examines whether violent television content is affecting your child. With that knowledge, you can make better voting decisions or decide whether and how to control your child's TV viewing.

My assumption in writing this book is that you are most likely going to be a communication professional. You will be designing campaigns, managing accounts, selling advertising, and doing other communication tasks. You will evaluate the impact of promotions, make programming decisions or decide on the best style or layout. You will read research reports, apply results to your campaign, contract for

research when you need to know who uses your products, discuss projects with your research department when you need to know your target, and respond to advertisers when they want to know the composition or purchase behavior of their audiences.

Both quantitative and qualitative methods are covered, but more time is spent on quantitative methods because so much of the research you will encounter is based on numbers, such as ratings and identifying target audiences and their behaviors. While de-emphasizing statistical calculations, I have included a few statistical tests as examples to illustrate how to interpret numbers that describe or form relations.

This book pays a lot of attention to variables. Several chapters are devoted to defining variables, operationalizing them, and evaluating their reliability and validity. You will ultimately have to answer questions like: Did my campaign (before vs. after) affect the image of my company? What subsets of the market are most likely to use my product? What characteristics (income, age, etc.) of the audience for my syndicated TV program are most valued by my advertisers? These questions are all about variables and relations.

This book is not meant to teach you ratings, media buying, and other skills that you will learn in other books and classes. It is designed to help you understand the research that produces those reports so that you can make judgments about the meaning of those reports and how well the research was done.

Notice that there is not one best way to do research. There are, of course, incompetent ways. But deciding how to collect data or whether to do a survey or focus group depends on your needs. Part of your job is also knowing which is appropriate: when to do research and when *not* to do research.

Keep in mind that research is only one of the tools that will help you make better decisions. The ultimate reason for reading this book is to help you make better decisions as a professional and citizen. If you were making a bet, which would you rather have, a fifty-fifty chance of winning or a 95% chance of winning? That's what research can do for you: increase the odds that you will make a correct decision.

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Chapter 1

Why Learn About Research?

Research directors and consultants who conduct polls, do ratings studies and carry out other projects must understand research methods and statistics to do their jobs. They must be experts. You might also assume that media sales people must understand research because they use ratings and other data to sell advertising. But it's not so obvious that other communication professionals need to understand research, too. For example, people who write public relations news releases must understand their audiences and the types of content and style that are most effective in reaching them. People who undertake creative projects also need research skills to evaluate the effectiveness of those projects or campaigns. This chapter points out that *all* communication professionals need to learn something about research to be successful in their jobs.

Research Skills Are Critical for Your Job

A recent broadcast industry want-ad for a sales manager specified that applicants must have a "working knowledge of Scarborough, Nielsen Ratings." Another recent ad for an advertising account executive required an "in-depth knowledge of ratings, research and computer skills." An online ad for a strategic planning project manager stated that "exposure to market research tools and techniques is a definite plus."

Even mass communicators who work on the creative side need to know something about research. Take, for instance, the following want-ad for a broadcast

news producer: "Experienced producer to lead our marquee newscasts. Organization and aggressive research skills are a must."

Public relations professionals can obtain accreditation through the Universal Accreditation Board (UAB). More than 75 percent of jobs posted in mid-2005 in the Public Relations Society of America job center specified UAB accreditation was "preferred." The UAB test requires analytical abilities, including "Objectively interprets data. Thinks logically. Identifies appropriate audiences (publics) and the concerns of each. Determines if goals and objectives of public relations program were met." And two sections of the test require research skills: "Develops a hypothesis. Develops the research plan. Determines appropriate qualitative and quantitative methods. Decides on the population and sampling techniques to use with that population. Designs instruments (questionnaire, interview, etc.). Uses the acceptable techniques to collect data. Codes and analyzes results and presents findings."

So you can see that many types of jobs in communication require fluency in research. Such knowledge will help you get a job and perform well once you are in it.

Communication Professionals Say...

As a major tool of communication professionals, research can be applied to most aspects of decision making. Research helps you understand the image of your company, how people feel about campaign issues, public opinion, how the market works and many other aspects of business.

Scott Simms, senior public information officer for Portland General Electric, points out that "research drives what we do." He adds:

> We track corporate favorability and general impressions of the company. We conduct focus groups about new product and service offerings as well as company and industry issues. We do satisfaction surveys among opinion leaders in government, business, community, the energy sector, etc. Virtually everything we do here is driven by research. Otherwise, why waste your time and other people's time trying to guess what your customers are thinking, your employees are feeling, and the public is reacting to?

Virginia McCarty, who is CEO, McCarty and Associates, Inc., a marketing firm in Seattle, Wash., also says it is crucial to learn about research.

> Students who plan to become communication professionals truly need to understand the importance of research and application of that research. In communications, research should be the basis in all approaches. Consumer options and patterns are where every project should begin. It is paramount to know what motivates our audiences to respond, listen or apply.

Janay Collins, senior product manager at Microsoft Corporation, elaborates on the relation between research and business objectives.

> Managers and other professionals need to focus on defining why they need the research in the first place — what action they will take from the results and how is it prioritized against the overall goals of the business. A well-managed research plan should coherently deliver on the business objectives. Finally, having defined the research goals and prioritized them within the business, the clients need to recognize the time (in weeks, not days) that it takes to put together a proper research project, and extract actionable steps from the results.

The late David Ogilvy, one of the founders of the advertising agency that bears his name (Ogilvy and Mather) and one of *AdWeek*'s most influential advertisers, was a strong advocate of using research to support creative decisions.

> Advertising people who ignore research are as dangerous as generals who ignore decodes of enemy signals.

In sum, these professionals say that research drives much of what they do, that managers and other professions also need to be able to define their needs and goals in relation to research, and that it's dangerous to ignore research. Guessing is not sufficient. Good research is necessary to understand the marketplace. You'll need to understand what constitutes appropriate research and the type of methodology (e.g., survey, a focus group, or Internet study) you'll need to solve problems. As Collins stresses, you'll have to prioritize your research objectives and clearly define your research needs and goals, which is the first step in the research process described in Chapter 3.

Research Reduces Bias

Bias is anything that interferes with making a rational decision. We are all biased in some ways. For example, some students think professors are forgetful. Some professors think students just want to party. These biases can interfere with successfully predicting how people will behave or the consequences of ad

campaigns and other communication actions. We should strive to reduce bias as much as possible.

Bias makes it difficult to get an objective analysis. For example, after seeing our latest creative effort, will our friends tell us we did a mediocre job? Not likely. Even if we seek other opinions by stopping shoppers in a local mall, can we conclude that these opinions accurately reflect the entire marketplace? Again, the answer is "no."

I worked on an audience study about a decade ago where many people said they thought their local newscast was "sensational." If you assume "sensational" news is bad, then you'd recommend that the TV station change its content to reduce sensationalism. But that change is based on the biased interpretation that "sensational" news is bad. What if the audience thinks it is good? In fact, follow-up research found that about half of the audience liked "sensational" news. So reducing "sensational" news might lead to a smaller audience, which would be a bad decision if the goal is to maintain or increase audience size.

Personal biases are those we carry inside of us, our beliefs about how the world works. They can make it difficult for us to understand different cultures. For example, research shows that people tend to associate with other people who have similar politics, ethics, habits and activities. This limits our contact and interaction with people who have different opinions, values, behaviors and tastes. Our biases can lead us to seek only the information that confirms our view of the world (called "confirmation bias"). Consider the issue of student drinking. Despite the reality that most college students do not drink to excess, if we only pay attention to news reports and media images, we could easily come to the opposite conclusion — that irresponsible drinking is the norm.

Some biases don't matter much. For example, you might believe that German chocolate cake comes from Germany, when the truth is that it actually got its name from an American whose last name was "German." But biases can become serious when they affect your life. For instance, if you think there is a lot of crime in your neighborhood, even if there isn't, you might restrict your travel or experience undue stress.

External bias is information we get from outside ourselves. It affects how we view the world, and it can fool us into making bad decisions. There can be bias in how we obtain information and how we conduct research. External bias can come in the form of misinformation. Perhaps we used census data to describe the Las Vegas market, but if the data were five years old, then it was fairly useless for such a fast-growing market. Maybe we did focus groups with 44 shoppers at the Mall of America, but do those 44 really represent all people in the market?

These examples illustrate that we need to be careful in applying our

assumptions and beliefs. To the communication professional, bias can interfere with how we evaluate ourselves, our work, target audiences and campaigns. Research, correctly conducted and applied, can help reduce biases. We can help that process by:

- Being analytical and skeptical,
- Being skeptical of our own view of the world,
- Being open to alternative perspectives,
- Being skeptical of others' views, including experts,
- Being careful in the application of information, including research.

By subjecting our beliefs, the information we acquire, and even our own work to verification, we can make better decisions. A major component of the verification strategy is to seek other viewpoints, modify our conclusions, and then subject those conclusions to scientific scrutiny. In communication studies, we subject our conclusions to *social science*, which is the study of and prediction of people's behavior.

Traditional Ways of Knowing

People try to determine how the world works in an number of ways. These ways include tenacity, authority, intuition and science.

Tenacity is based on believing something just because the belief has been around a long time or has been often repeated. It is difficult to counter because of a psychological condition called "belief-perseverance" — a tendency to believe despite contrary evidence. Examples include:

- Students can leave a classroom if the teacher is late, but they have to wait longer if they are full professors.
- As long as one doesn't charge money, it's OK to use copyrighted material.
- There are more crimes during a full moon.

Authority is based on trusting the source. Trusted sources include ministers, judges, experts and even professors. Trusting the source can lead to accepting misinformation. For example, an expert might tell you that humorous ads attract more attention than serious ads, but without verifying this, would you create a humorous ad for a funeral home?

Intuition is an internal belief, a gut feeling or personal insight. This includes "common sense." Intuition is difficult to counter because of "confirmation bias" —

a tendency to only look for evidence that supports our intuition and other defenses we erect to protect our beliefs.

This may not be a problem if the outcome is minimal. Betting and losing $5 on the Giants isn't a big deal to most people. But would you "bet" $85,000 on an advertising campaign just because your intuition tells you it will work. Do you really want city hall to spend millions of dollars on a new civic center because they "think" it will attract conventions? Should your company invest in an expensive high-speed network just because your gut feelings tell you it will make employees more productive?

The problem with the above three methods of knowing is that they are difficult to "falsify." That is, they do not have a method for determining the truth or falsehood of a proposition or belief. For example, you can't falsify the belief that there are more crimes during a full moon unless you check data on crime compared to phases of the moon. When you do that (i.e., engage in empirical observation), you are no longer relying on tenacity but are employing scientific methods of research.

Common Sense May Be Wrong

We are all tempted to think that our understanding of the world is accurate. We often say, "It wouldn't have happened if they had just used common sense."

Yet much of what we think makes sense is simply wrong. For instance, many people in the United States think that water going down a drain spins in a counterclockwise direction because of the spin of the earth. The "Coriolis effect" is extended to water in a basin. While the Coriolis effect impacts large systems like the Earth's atmosphere, it has little effect on drains because other factors, like the shape of the basin, have a greater impact.

Beliefs in myths like this have a minor impact on most people's lives. But other beliefs can have major impacts on public policy or our lives. For example, many people believe that humans only use 10 percent of their brains. But brain imaging (MRI and PET scans) and electrical stimulation of the brain show that the vast majority of the brain is used. If legislators believed the myth, they presumably would be more likely to spend sizable public funds on commercial techniques to increase brain usage among school children. And if you believed the myth, you might waste a lot of money for online drugs, juices and other so-called brain boosters.

Science Is ...

The alternative to foundering with our beliefs is to use science. For purposes here, science will be defined as observation, identification, description, investigation, and explanation of phenomena. To do science, a study must have the following characteristics:

- Empiricism
- Objectivity
- Testability
- Falsifiability

Empiricism means "observing." Instead of only thinking about an issue or asking others what they think, you observe the phenomenon. Observing includes "to look at" as a way to empirically assess people's behavior, but the term includes many other methods of observation. We can ask people questions to "observe" their attitudes. We can have people fill out a test to "observe" their knowledge.

Objectivity does not mean that researchers have no biases. Rather, it means that we employ methods to reduce our biases and make those methods public so that others can evaluate and replicate the research.

Testability means that you observe phenomena that are amenable to measurement. For example, most external human behavior is measurable (e.g., purchase behavior) while some internal thought processes are not (e.g., communicating with the dead).

Falsifiability means that your conclusions can be disproved. It is intrinsically linked to the three elements listed above. Science means making those methods available to other researchers so others can criticize as well as replicate your study to see if the same results can be achieved.

The ultimate goals of science are explanation and prediction. Your research ideally should help explain people's attitudes and behavior while also predicting future behavior. This helps test whether your conclusions are correct (falsifiable).

You'll Have to Work with Research

Regardless of how you feel now about research, you will have to deal with it in the real world. You probably will have to work with a research director, read and apply research reports, and evaluate your work with research. You may have to work with a research team when your clients demand facts and figures. You may be asked to provide input for your company's research projects.

You will have to understand your client's needs and goals. You will have to communicate those needs and goals to the research people, prioritize those needs (because you can't do everything in one project), understand what constitutes good research, know whether the project will be practical in terms of time and money, and know whether you have met the goals.

Electronics are Changing Your World

Within the last decade, major changes have taken place in the field of research. This includes the trend toward online focus groups, electronic data collection, doing analyses in your own spreadsheet, and the impact of new technologies, like cell phones, on telephone research.

You need to keep up with the changes and respond to them. Research will help. Not only will you need to follow media coverage of your company or changes in your market, you may have to deal with problems caused by the Internet. One new type of problem you will probably encounter is negative electronic publicity. For example, Target Corporation found itself faced with e-mail claims that it did not contribute to veterans' causes, and Starbucks faced assertions that it refused to send free coffee to U.S. soldiers serving in Iraq.

Dealing with these potential problems will require more than a gut feeling. You'll need to know what was written, how extensively it has been distributed, whether it has had an impact and, if so, if there anything you can do about it?

Chapter 2

A Brief History of Communication Research

One chapter cannot adequately cover the history of the development of communication research. However, it is important to know something of its history if only to appreciate the idea that communication research has a tradition — an accumulated body of knowledge (which is a hallmark of science) — and to understand why it has various methods and uses.

Communication research owes its development to other disciplines, primarily other social and physical sciences. Of course, once established, communication research developed its own lines of inquiry just like other disciplines. The histories of other disciplines, such as marketing research, overlap with communication research but are not covered here.

Communication research has two main emphases or applications: *academic communication research* and *applied communication research.* The former is closer to the social sciences of sociology, political science and psychology, as well as to some qualitative approaches like ethnic studies. The latter is closer to marketing research in business and finance. But both areas overlap. For example, recent theories that explain the impact of technologies on society grew out of audience studies for cable television and other media, and advertising studies about the impact of campaigns borrowed heavily from academic work in psychology and advertising research in business schools.

The following summaries are based on various sources that you are

encouraged to consult along with many others that you can find on the Internet. These sources include "Timeline for the history of science and social science" (http://www.mdx.ac.uk/www/study/sshtim.htm), "The History of Science" from *Wikipedia* (http://www.wikipedia.com), Houghton-Mifflin's online "Readers Companion to American History," Everett M. Rogers' *A History of Communication Study* (New York: Free Press, 1997), and an online summary by Em Griffin, "A First Look at Communication Theory" (www.afirstlook.com/archive /talkabout.cfm?source=archther).

History of Science

For thousands of years humans have inquired into the nature of the universe. Originally, the inquiry was philosophical, characterized by tenacity, authority, and intuition, and some observation without the modern methods of science. In other words, *reasoning* was the primary method used to explain how the universe worked, including inductive and deductive reasoning. Reasoning is an important element of science, but the early philosophers didn't often engage in empirical observation and, as a consequence, often reached incorrect conclusions, such as the idea that "heavier bodies fall faster than lighter bodies."

The scientific revolution in the 16th and 17th centuries, led by European scientists like Copernicus, Newton, Galileo and Kepler, moved science from philosophy to a mathematical, mechanical and empirical field of study. This is not to say that there were no studies before this period or in other parts of the world that tried to break away from the philosophical tradition. The concept of "zero," for example, was first recorded in Mesopotamia around 3 B.C. and in India in the mid-fifth century. It spread to Cambodia in the 7th century and into China and the Middle East by the 8th century, but didn't reach western Europe until the 12th century. "Algorithm," named for a Persian mathematician, consists of logic and repeatable steps that lead to a specific outcome. The Middle East also developed the use of citations and peer review.

The 19th and 20th centuries saw the expansion of the explanatory power of chemistry and physics through an understanding of electricity and the atom, the unification of mass and energy, and great strides also were made in geology, medicine, and other areas.

History of Social Science

Social science as the study of human groups arose in the West during the nineteenth

century as an attempt to apply the progress made in the natural sciences to humans. European social scientists had a more philosophical orientation while American social scientists focused more on data-gathering. This essentially marks the distinction between the major methods of social science: qualitative (philosophically and critically oriented and focused on interpreting words and actions) and quantitative (numerically oriented). Both are used by scholars the world over.

In the United States between 1880 and World War I, a variety of professional organizations and social science journals were founded (e.g., American Political Science Association, American Sociological Society, *American Journal of Sociology* and *American Political Science Review*). Also academic departments were established in universities (e.g., economics, sociology, and psychology). The hope of social scientists at the time was that research would solve social problems like poverty and crime.

In the early 1900s, social science research was exemplified by quantitative studies like those of voting behavior. The role of qualitative research is illustrated by the work by anthropologist Margaret Mead, combining reports of fieldwork in the South Pacific with social criticism concerning basic values. This sparked controversy in the social sciences. Moralists were accused of not being scientific enough. Conversely, "pure" social scientists were accused of being narrow and unjustly claiming to use the methods of the natural sciences.

History of Communication Research

Communication research has its roots in ancient Greece, where the study of rhetoric, which is the art of effective speaking and persuasion, was a central subject for most students. That was the essence of communication research until about a century ago, when speech communication began to emerge as a distinct academic field.

For the first half of the last century, college speech teachers were usually members of English departments. Speech teachers stressed oral performance and began communication's first professional group, the National Association of Academic Teachers of Public Speaking, which published the *Quarterly Journal of Public Speaking*. The focus was on giving practical advice to those trying to influence audiences through public address, radio announcing, drama, and other applications. The intellectual foundation for the discipline primarily came from the writings of Plato, Aristotle, Cicero, and other historical rhetors.

Communication studies as a social science began to emerge after1930. Wilbur

Schramm, director of the Stanford Institute for Communication Research, identifies four men from that era as the "founding fathers" of communication research: (1) political scientist Harold Lasswell, who analyzed Nazi propaganda; (2) social psychologist Kurt Lewin, who investigated prejudice and the way groups influence the decisions of individual members; (3) sociologist Paul Lazarsfeld, founder of the the Bureau of Applied Social Research at Columbia University, who tested theories about marketing along with pioneering innovative survey and focus-group techniques to evaluate the emotional impact of broadcasting; and (4) experimental psychologist Carl Hovland, who tested the persuasive effects of source credibility (the believability of a speaker) and the order of arguments within a message.

During this time, other fields of study also influenced communication studies. In the 1940s, Claude Shannon and Warren Weaver drew on mathematics to develop an information model that attempted to measure noise in electrical transmissions for the purpose of improving Bell System's telephone service. It focused on two parts: how much information can be communicated within a system and what parts of the system affect the communication flow. Although Shannon said that human communication was outside the scope of his model, many communication scholars have studied his model and adapted it to communication research. For example, David Berlo used it in 1960 for the famous "SMCR model of communication" (source-message-channel-receiver), and Harold Laswell extended it to his famous definition of communication: "Who says what to whom via what channels with what effect?"

Communication studies as a formal discipline within the university began to emerge after Wilbur Schramm and other social scientists met to discuss issues during World War II. At that time, there were no doctoral programs in communication, and many undergraduate programs resided in journalism programs. By the late 1940s, some Big 10 schools like University of Iowa and University of Wisconsin had created Ph.D. programs in mass communication.

The period 1950 to 1970 also saw a great deal of growth in the discipline. Many colleges and universities offered courses in "Public Address," "Oral Interpretation," "Argumentation and Debate," "Persuasion," "History of American Public Address," and "Classical Rhetoric." But during the 1960s big changes took place. Many schools replaced "Public Speaking" with "Interpersonal Communication." Interpersonal and media communication were hot topics. Oral interpretation and public address were not. Voice and drama courses were housed in speech departments or in completely separate departments. Communication programs were established at Iowa and Illinois, and the first department of communication and college of communication were created at Michigan State University.

Communication research also owes a lot to sociology. In the 1920s, several sociologists at the universities of Michigan and Chicago began examining the impact of mass media. Psychology contributed as well by doing experiments that assessed the meaning of communication. By mid-century these fundamental studies had evolved into more obvious communication areas like "propaganda," and, by the 1970s, "agenda setting" was a big topic of study.

The development of communication research programs was not without some problems. Tension often existed between professionals and scientists and between qualitative vs. quantitative approaches. To some extent the dichotomies are real, but many programs and researchers have been able to straddle the boundaries. After all, quantitative scholars have used qualitative studies to develop their questionnaires and scales, and qualitative scholars often point to surveys and experiments to support their arguments.

Once communication became established as an academic discipline in universities, it was free to pursue its own lines of inquiry, although it did not abandon traditional lines like "agenda setting." New inquiries examined such topics as "information source selection" in the 1960s and 1970s, and "cable TV, Internet and other technology adoption" in the 1980s, 1990s and 2000s. Of course, now there are hundreds of lines of study.

The Future of Communication Research

There will continue to be the discussion of where communication study belongs. Is it a humanity or a social science? Should theoretical studies be in communication departments and professional studies in business and journalism schools? Or should they all be together?

There is no crystal ball but trends can be identified. Two major traditions in communication research have emerged in the last 50 years. The first derives its background from rhetorical studies, and it now is manifest primarily in "communication studies." The second has a more professional tradition, arising out of studies in marketing, industry research, and advertising and public relations in communication departments.

There will remain, on one hand, some tension between the academic community and private industry. Some academicians want to keep their disciplines "pure," eschewing the "bottom line" mentality of industry, while some professionals lament academics' lack of understanding of media industries about which academicians conduct their research. Yet, on the other hand, there is a lot of cooperation between professionals and academics. This includes professional

associations that offer research grants to universities, such as the National Association of Broadcasters' "Grants for Research in Broadcasting," and professors who consult with industry to make applied research more valid.

Chapter 3

The Research Process

As noted in Chapter 1, you, the communication professional, will have to help develop the research plan and goals and will have to understand the research process so that appropriate methods can be selected. In addition, you need to know whether the project is doable; that is, can the budget support it and is there enough time to do the research properly?

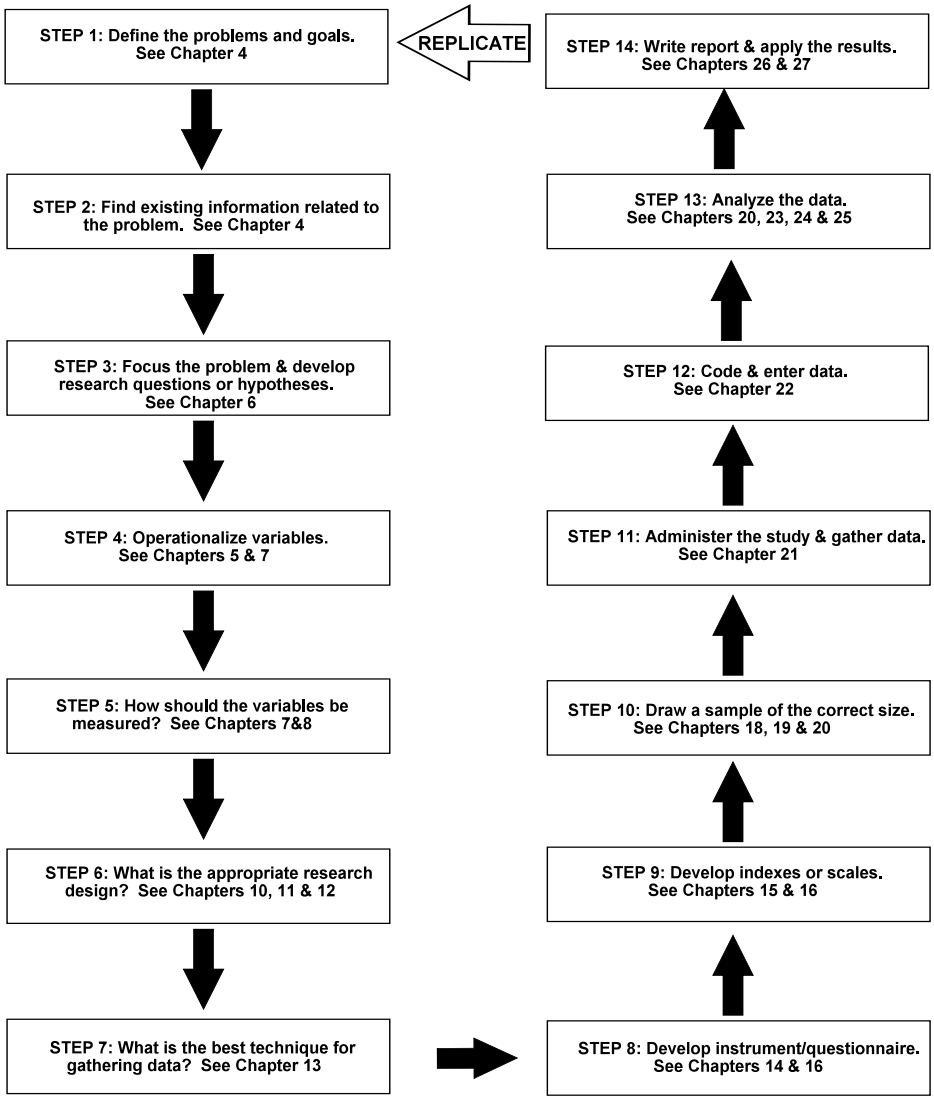
The following guide will help you make sure your projects are achievable, and the guide can be used as a sort-of table of contents to this book.

Steps in the Research Process

Figure 3.1 on the next page shows step-by-step the process of research. Starting at the wrong step or skipping a step can lead waste time or money. For example, if you skip the first five steps, jumping immediately to Step 6 and decide to do a telephone poll, you might spends thousands of dollars on a research project and get valid results but then have no place to apply those results because you had no goal (see Step 1).

Having said that, I need to make two important points. First, you can't help but mull over the steps out of order. For example, you will be thinking about variables even as you write your needs and goals or develop your research questions, but you'll finalize them later when you *operationalize*. And second, you need to know all of the steps before you can realistically do step one; that is, you

Figure 3.1
STEPS IN THE RESEARCH PROCESS



cannot know if your project is doable if you don't have a sense of what designs and techniques are available and what resources are required for them. There is also some overlap; Chapter 20 ("Sampling Error and Sample Size") relates to an early step, "Draw a sample of correct size," and a later step, "Analyze the Data.." But don't jump around the steps arbitrarily because that can adversely affect the

validity of your project.

In this book chapters also are devoted to issues that do not fit easily into the steps in Figure 3.1 because they are designed for understanding concepts (e.g., cause-and-effect [Chapter 9], how normal probability applies to sampling [Chapter 17)], application examples [Chapter 27], ethics [Chapter 28] and where to get more information about research [Chapter 29]).

I would like to preface each step above by saying, "This step is crucial." Ignoring one can ruin your entire project. You may choose to skip a step only if you cannot use it. For example, you may choose not to use a scale (Step 9), but you must consider first whether the complexity of your variables warrants using scales. In many cases there are implications for other steps.

With these caveats in mind, let's look at each of the steps in more depth.

STEP 1: Define the problems and goals. You will identify why you need to do research and how you will use the results. If you have no clear goals for using the results, you should not be doing research in the first place. Write down your needs and goals.

STEP 2: Find existing information. You might find some possible solutions to your problems by examining previous research. In addition, you need to know what other researchers have done so you don't "reinvent the wheel." This can save you time and money.

STEP 3: Focus the problem and develop research questions or hypotheses. You need to be specific in order to identify which variables, measures, designs, etc., are related to your needs and goals. This is usually done with "research questions," if you are charting new ground, and with "hypotheses," if you have found a body of consistent research in Step 2.

STEP 4: Operationalize variables. Define each variable. This is not always as easy as it seems. "Income" may be simple, but "factors," "image," "attention to my ad" and others can be difficult to define.

*STEP 5: How should the variables be measure*d? Merely identifying variables is not sufficient. Do you eventually need averages or percentages, or just the words people say? Should you have categories or real numbers? Do you need to do a scale or will one question be sufficient?

STEP 6: What is the appropriate research design? Should it be a focus group, a survey, an experiment, or a case study? Qualitative or quantitative? There are many designs from which to choose.

STEP 7: What is the best technique for gathering data? Should it be in-person, or telephone, mail, or electronic (e.g., Internet)? Each has advantages and disadvantages.

STEP 8: Develop the instrument or questionnaire. Will you be using a mail questionnaire, a Web-based questionnaire, a focus group agenda, or what?

STEP 9: Develop indexes or scales. Not all variables can be measured with just one question. Attitudes, opinions, knowledge, lifestyle and other variables can be very complex, requiring multiple questions (or measures). If you need more than one question to define a single variable, you should consider creating scales.

STEP 10: Draw a sample of the correct size. Should you use a sample? If so, what kind and what size? How do you know it represents the population?

STEP 11: Administer the study and gather data. Merely collecting data is not enough. How do you know it's being collected correctly? Is the study proceeding according to schedule? How can you be sure your consultant is doing his or her job?

STEP 12: Code and enter data. While you hope your consultant or research department is doing this for you, do you understand what the numbers (codes) mean? Will you be able to get the analysis you need? If you have words as data do you need to make categories for them?

STEP 13: Analyze the data. Here you find out the answers to your research questions or hypotheses. Here you also have to temper your interpretation of the results when you decide if relations between variables exist and whether they are important. Your knowledge of concepts like "cause-and-effect," "generalizability," "significance" and "explained variance" is crucial here.

STEP 14: Write report and apply the results. A report is more than just a cluster of tables. It should also contain information about why and how the study was done. You should retain all data, questionnaires and other project material. Of course, the report is of no use unless it is applied to solve the problems and achieve the goals you identified in Step 1.

REPLICATE. The last step points back to Step 1. Remember from Chapter 2 that science is testable and falsifiable. This is where that takes place. You

Table 3.1
EXAMPLE OF SURVEY BUDGET

Office phone/LD	$25.00
Office supplies	20.00
Mail	40.00
Travel	65.00
Hotel	200.00
Meals	60.00
Purchase RDD sample	800.00
Sub-contract data collection (phone center/CATI)	4,000.00
TOTAL	$5,210.00
Consulting (design, questionnaire, analysis, report)	$9,000.00
GRAND TOTAL	$14,210.00

> replicate because research is never 100 percent correct; it is subject to many types of errors (sampling error, limits on the frame, and so on, covered in later chapters) and we are only "probably sure" of the results. So you need to regularly conduct research to verify your results or look for changes.

A major consideration of any project is budget, both time and money. At any step you should be thinking about this so you don't waste effort on research fantasies. Some projects can take more than a month (see the timeline in Chapter 21), and research often is expensive as illustrated by the budget in Table 3.1 for a simple one-shot survey of 300 respondents.

Chapter 4

Defining the Problem and Finding Existing Information

Don't get ahead of yourself is good advice to follow when conducting research. I once talked with a potential client who asked me about doing a telephone survey of radio listeners to find out if a new competitor was eating into his station's audience. When we backed up to Step 1, we learned that a weak transmitter was creating much of the problem, and moving the transmitter tower or increasing its power was the first consideration, not research. This illustrates again why it is so important to first define your problems and goals.

Defining the problem should identify the information needed and the goals for using that information. Without a problem definition, your research will be unguided, and the results may not be applicable to your needs. Without goals, you can spend a lot of time and money for data that apply to nothing. Write down the ideas into a *problem statement*. Exchange it with your staff, colleagues, consultant or research director. Come back to your problem statement and revise it.

Generating Problems and Goals

Some problems are easy to identify, like a sudden drop in revenue or a startling increase in negative stories in the media. These are only potential problems, because until you gather more information you don't know the extent of the problem, what might be causing it, or indeed if there is a problem in the first place. Is the drop in

revenue just a cyclical variation in sales? Did any customers even read the negative stories?

Potential problems can be identified by a virtually unlimited number of sources. These sources include:

- Your advertisers
- Customer comments
- Your own observations
- Your staff
- External analysts and experts
- Brainstorming
- Your annual report
- Other research you've conducted
- Trade publication stories
- Your family and friends
- Your local newscast
- Articles you've read in the newspaper

Problem Statement Examples

Problem statements are specific written expressions that contain two elements: (1) a clear exposition of the need, and (2) a clear articulation of the goals for the use of information you gather about the problem.

Problems can be simple such as, "I'm new to the market and need to know its demographic makeup," or more complex: "Opinions about my company have changed. Why?" Gathering information about these problems should help you make better decisions about your market or campaigns. In many cases you may identify multiple problems. So multiple problem statements may be combined into a single research project, or you may find several projects are necessary to examine all of the problems. Below are three examples of problem statements. In each case the overall projects involved more than one statement. These have been simplified for the examples.

Example A

A local weekly newspaper found that local advertisers were becoming as sophisticated as larger national and multinational organizations in their demand for information about their readers. At a weekly meeting, the paper's sales staff revealed that local advertisers were reluctant to purchase ad space because the sales people could not provide information about the readership,

including demographics and purchase behavior. Although the paper's managers believed their readers were an upscale, highly educated part of the community, there was no hard evidence to support that. Based on the advertisers' and sales staff's comments, the publisher defined a straightforward problem.

> *Problem Statement:* We need to know the demographics (education, income, etc.) of our readers and their expected purchase behavior (auto, clothing, etc.), along with readership (weeks per month read, sections read, pass along, etc.) in order to assist the sales staff in targeting dealerships, retail clothing outlets and other local advertisers.

Notice that the problem statement includes a section about the needed information (demographics, purchase behavior and readership) and a section about the goal for using that information (to assist the sales staff in targeting local advertisers). The statement suggests that a simple readership study — one that would survey readers about their income, age and other demographics and their expected purchases of autos, clothing, etc. — would work best.

Example B

Some problems are more complex and go beyond simple descriptions of a population. A regional hospital's public relations director noted that revenue at the hospital had flattened and attributed that drop to increased competition in the local market. Other hospitals in the region were advertising more aggressively. In addition, national surveys reported in trade publications indicated that patient images of hospitals in general were shaped by interactions with the staff, the so-called "bedside manner."

> *Problem Statement:* Kadlec Medical Center, a regional hospital in Tri-Cities, Washington, needs to know what factors are important when patients select a hospital. Do those factors conform to results from national surveys? Kadlec needs this information in order to know what to emphasize in its advertising and promotional campaigns in order increase bed use.

This example contains a "relational" issue rather than merely a descriptive one. It implies more difficult research than Example A because you would have to, first, identify the factors people use to select a hospital; second,

develop ways to measure the importance of those factors; and, third, relate those factors to hospital selection.

Example C

The King County Council of Camp Fire (now the Central Puget Sound Council) is a nonprofit youth organization. To raise money, the organization creates campaigns aimed at government and private funding agencies (many of which require demonstration of service to both boys and girls), volunteers, members and potential members. The organization noted that some of its programs had low participation, and it suspected that the traditional name associated with the organization, Camp Fire *Girls,* might explain the low participation of boys. The organization had no other research to draw upon that examined these issues.

> *Problem Statement:* Camp Fire needs to know some basic information along with variables that affect participation and donation. The focus is on the general public (both parents and children) in the counties it serves, its members (both parents and child members) and potential corporate contributors or volunteers. Are they aware of Camp Fire? What does Camp Fire mean to them? Are they aware of the various programs that Camp Fire has for adults and children, boys and girls, different ages groups, and different needs? Answers to these questions will identify targets and will help guide the emphasis of the promotional campaigns targeted to each group.

This project required a more complex research project because it involved multiple target groups, relations (factors affecting participation and donation by multiple targets), and more variables (awareness of brand, awareness of programs, etc.).

Find Existing Information

It is important to search for available information about your needs and goals (Step 2). Perhaps national studies have been conducted on some of the issues identified in your problem statement. Maybe you have research that your company conducted several years ago. Look through syndicated research. While ratings and other narrowly descriptive numbers may not solve your problem, they can give good descriptions of your market. Archives like the Census Bureau and city and county clerks' offices can provide good descriptions of your overall market. And don't

forget the scientific literature in journals and books.

Even if you can't find existing relevant research directly related to your needs, previous research can show you how to ask questions, provide existing scales to measure image, and so on, so you don't have to waste time developing those.

Stop and Think

At this point, it is wise to think about the costs of your study and its feasibility. Think about possible variables and research questions. Are they measurable and answerable? Is it realistic to proceed?

A *research plan* can help answer those questions, and it is essential to any project you undertake. Such a plan tentatively lays out the expected research questions, research design, data collection technique, analysis, etc., along with expected costs and time involved. Remember, you should stop any time in the research process when the study outstrips your resources or when you realize that continuing would be futile.

Chapter 5

An Introduction to Variables and Variance

I introduce variables here, before Step 3, because you must always be thinking, "What are the variables?" If you cannot identify variables in your problem statement, you should not do research. After all, the focus of all research is on variables and variance.

A *variable* is anything that varies; *variance* is how much something varies. Think about it. You want to know how people change, not how they stay the same. If people's buying habits were constant, you would know exactly what they plan to purchase. You would not care about campaigns because there is no change. But people do change. They change when their lives change, when they get new information, when they are emotionally evolved, when their friends influence them, and when they grow older.

If people didn't change, there would be "zero variance." The importance of knowing how much people change is to know what the impact of that change is or what the impact of your campaign is. You'd like to know whether to expect sales to increase 1 percent or 20 percent, whether you need a 5 percent change in voters or a 25 percent change to win the election, or whether your promotional campaign improved the image of your company 1 percent or 15 percent.

It is by knowing variables and how much they vary that you determine what causes people to change, how much they change and whether or not what you did caused that change to happen.

The Importance of Variables

Variables are intimately involved with all stages of the research process. You need to think "variables" when you write down your needs, when you create questionnaires, when you do analysis, and every other step. You'll need to fully understand your variables or you won't be able to write good questions for your questionnaire (e.g., do you need categories of income or exact dollar amounts?) and you won't be able to determine whether to do an experiment or survey (e.g., you can't randomly assign gender but you can randomly assign viewership of your ad for an experiment).

After you have clearly defined your needs and goals and focused on research questions or hypotheses, you have to precisely define variables so that everyone involved in the project or reading the report will know what the data mean. You should know, for example, if "income" means household or personal income, and if it's measured in categories and the values of those categories. Before you can write research questions or hypotheses about relations between variables, you need to know what variables are implied by your needs and goals.

Conceptualizing Variables

Conceptualizing a variable is not always as easy as it seems. For example, try to identify the variables in the following:

> Among women, 18-34 years old, 68 percent are aware of my company's participation in the community fund-raiser.

I deliberately threw in the plural "variables" as a trick. There is only *one* variable, "awareness of participation in the fund-raiser," because it is the only term allowed to vary (people can be aware or not aware). "Among women" and "18-34" merely define the target population. Men and other age categories are excluded. Terms that are not allowed to vary are called *constants.* The obvious reason that these are not variables is that they have only one category, and, thus, they do not meet the definition of a variable. Examples of variables and constants are found in Table 5.1.

Operationalizing Variables

Operationalization means to create a definition for a variable that can be used in research and relates to the needs and goals of your study. In other words, to put the

Table 5.1
LISTS OF VARIABLES AND CONSTANTS

Variables	Constants/Targets
Gender	Men
Age	Over 50
Television viewing	View TV more than 3 hours/day
Image of my company	Has a positive image of my company
Reasons for not exercising	Exercisers
Children vs. adults	18-35 year olds

variable into operation. Details about operationalizing are in Chapter 7.

There is no best operationalization. It depends upon how you conceptualize or define your variables. As long as the measures you create are useful for testing your research questions or hypotheses, then they are good. Also remember that there are multiple definitions for any variables (e.g., "age" can be in categories or real years). If you can't create an operational definition for a variable that someone else can understand, then you have failed.

VARIANCE

Variance is the amount of variability in your variable. On one hand, suppose you were assessing how many hours people spend using the Internet each day. If most people spend two hours, only a few spend zero, one or three hours, and no one spends more than three hours, there would be little variability. Consequently, you would have a small range in which to differentiate people. On the other hand, if you were measuring age of adults in the general population, you would have many people at many ages from 18 to 100+. You would have a large variability — a very wide range to work with.

Statistically, variance means the dispersion around the average (statisticians call the average the "mean"). The larger the variance, the more widely scattered the values around the mean.

The concept of variance is important later in Chapter 24 when you read about *explained variance*. As a researcher you want to explain why variability occurs, so

you need to discover how much variability there is and how much of that variability you can explain or predict.

Let's take a practical example. Suppose you want to know about people's perceptions of your company. You would probably create a scale to measure the image of your company — perhaps it would have a range of values from 1 to 10, with one meaning "poor" and 10 meaning "very good." That doesn't mean people will extend over all those values. It's possible that people have a very positive image of your company and the real range in the population might be from 8 to 10. That's a small range, and you would just note that this seems positive and stop at that.

But if you found there was a large variability — some very negative, some very positive, and some in between — you would have a range of numbers more like 2 to 10. Then you would want to know what's causing the variability. Are males more negative than females? Do those who saw your campaign rate your company more positively than those who didn't? Is it the weather? Is it how much news coverage you got?

Merely identifying those causes is not enough. You need to know which of them are more important and how important they are. That's where explained variance comes in, because it tells you how much of the variability in image is explained by each variable or by all the variables taken together. Even if you found out that your campaign had an impact on image, if that impact was only 1 percent, then you might not be very confident in the success of your campaign compared to the impact being 15 percent.

There is a phenomenon in statistics that if the sample is large enough, all variables are "statistically significantly related" to each other. Unfortunately, most of those relations are trivial. That is, they share little variance with each other. Looking at variance will help you detect which three or four or five relations are the strongest and, therefore, the most important for you to use to make decisions.

Chapter 6

Research Questions and Hypotheses

Having thought about the variables implied in your needs statement, you are ready to make the transition between understanding your needs and goals and the development of your *research questions* (RQs) and/or *hypotheses* (Hs). RQs and Hs help narrow and focus your needs. Once you have written RQs or Hs, you will need to define or "operationalize" your variables (see Chapter 7).

Descriptive vs. Relational Research

Before writing RQs or Hs, you need to make sure you understand what kind of questions you are contemplating: descriptive or relational or both.

Descriptive research — and descriptive RQs — are just that: describing a population. Although you may ask many questions and have many separate variables, you are only interested in one variable at a time. For example, you may want to know the demographics of your market. You only describe average income, percent male, percent owning a home, average number of children and so on.

Relational research — and its Hs and its relational RQs — look at how variables change together, in relation to each other. So that means examining two or more variables at the same time. For example, if you wanted to know how demographics related to each other in your market, you should compare gender and income (do males have higher income than do females?), marital status and home

ownership (does a higher percentage of married people own homes than unmarried people?), and so on.

What is a Hypothesis?

Research questions can be either descriptive or relational, but hypotheses are always relational. A *hypothesis* is a causal statement about a relation between two variables. At least one of the variables is an *independent* variable (IV) and at least one is a *dependent* variable (DV). An *independent variable* is the presumed cause, and the *dependent variable* is the presumed effect.

For example, you might expect that people with higher incomes are more likely to buy a Porsche than people with lower incomes. You expect income to affect the decision to purchase a Porsche. So income is the IV and buying a Porsche is the DV.

A hypothesis is the most formal statement that a researcher can make about relations among variables. Hypotheses are used to predict results in a research project. They ideally are made before data collection and should be based on the problem statement. And they are often derived from previous research; that is, a hypothesis is derived from a theory or it is generalized from a body of previous research. Thus, a hypothesis is:

- a statement
- based on previous research or a theory
- about a causal relation
- between two or more variables, one of which is the independent variable (IV) and the other of which is the dependent variable (DV)
- amenable to research and replication.

The best way to test a hypothesis is with an experiment. However, many hypotheses cannot be tested with experiments because you cannot control the IV. That is, you cannot randomly assign various levels or categories of the IV to subjects. For example, if you expect the image of your company to affect how often people shop at your store, you cannot randomly assign the image people hold inside their brains.

The following example of a hypothesis is derived from "Diffusion Theory" which is characterized by various chronological stages of adoption, including "innovators, early adopters, early majority, late majority, and laggards." If you are promoting a new invention you could use the theory to predict that the first buyers would be "innovators" and "early adopters." The theory and its related body of

research characterize early adopters as venturesome, who are able to understand and apply complex technical knowledge, are able to cope with a high degree of uncertainty about an innovation, and have success in careers and income. Thinking about variables ("operationalizations" will take place later), you can already identify several: adoption (whether or not), venturesomeness, amount of technical knowledge, amount of uncertainty tolerated, employment status, and income. Likewise, several hypotheses can be derived. Try to identify the DV and IV in each.

H1: Those likely to adopt my invention are more venturesome compared to those not likely to adopt.

H2: Those likely to adopt my invention have higher incomes compared to those not likely to adopt.

In both of the hypotheses the DV is "likelihood of adoption." In H1, the IV is "venturesomeness," and in H2, the IV is "income."

An example of a hypothesis generalized from a body of research comes from research on information source use. Since the 1950s, it has been clear that the most frequently cited sources for information about what's going on in the world today are newspapers and television (see, e.g., Roper polls and other studies), but other research shows that different sources are used when specific information is sought. For example, when seeking financial information people are more likely to use media like phone and Internet over newspapers and TV. But there is no "theory of information source use." In general, the body of research shows that "mass" media are more used for general topics and "narrow" media are used for specific topics. The expectation may be that the topic causes people to select different media. Thus, a hypothesis may be derived that says:

H3: People are more likely to select the Internet, magazines and human sources over TV, newspapers and radio as sources for information about personal financial investments compared to information about international events.

In this hypothesis there are several variables: "topic" (personal financial information vs. information about international events), "likelihood of selecting the Internet as a source," "likelihood of selecting magazines as a source," "likelihood of selecting people as a source," "likelihood of selecting TV as a source," "likelihood of selecting newspapers as a source" and "likelihood of selecting radio as a source." But which is the IV and which is the DV? Think about what's causing

what. It's changing the topic that changes the sources people select, so the "topic" is the IV and the others variables are DVs. Notice that you can include more than two variables in a hypothesis; i.e., there can be multiple IVs or DVs.

Research Questions

A *research question* is exactly that — a question that can guide your research. Unlike a hypothesis, a research question can ask about anything as long as there is at least one variable that can be studied. You don't have to have a previous body of research — you can just ask because you want to know. Thus, a RQ:

- is a question,
- is related to your needs and goals,
- contains at least one variable, and
- is amenable to research and replication.

Although a research question can be very simple and narrow, it is often more than that. It can ask about more than one variable. It can ask about relations. It can be based on previous research. It can be either descriptive or relational. Try to identify the variables and spot the descriptive vs. relational RQs in the following:

1. What are the demographics of my market?
2. Are males more likely than females to shop at outdoor recreation stores?
3. What are the factors that cause people to select one brand of house paint over another?
4. How satisfied are customers with service in my restaurant?
5. What is the image of my company?
6. What target populations (based on gender, age, and lifestyle) are most likely to buy sports equipment?

Some of the RQs contain multiple variables; others just a single one. For example, RQ1 implies several demographics — income, age, etc., while RQ4 has a single variable — "customer satisfaction."

Also notice that some of the RQs are descriptive (1, 4 and 5) while others are relational (e.g., RQ2 relates "gender" to "likelihood of shopping at outdoor recreation stores").

Are All RQs and Hypotheses Testable?

Once you give some thought to this question, the obvious answer is "no." There are many questions that cannot be answered scientifically. There are a number of reasons for this. First, it may not be possible to observe the phenomenon. For example, John Edward used to have a TV show where he claimed to communicate with the dead, but there is no method for getting inside his head to find out what really is going on.

Second, the phenomenon may be too brief or unique so that there may not be any evidence available. For instance, if there is a bright streak of light in the sky that many people see in different parts of the country, but there is no debris and no radar scan available, we may never know what caused the light. We might speculate that it was a meteorite or a UFO, but without confirming evidence we won't know for sure.

Third, single events are not susceptible to scientific testing. There may be lots of evidence but the event cannot be observed multiple times. In other words, if it doesn't happen often enough so we can observe it many times, we can't know much about it. For example, there may have been a spike in sales of yogurt on January 16, 2006, but it hasn't happened since then. You could go back and look at what might have been different about that day — the weather, news reports about the health benefits of yogurt, or a change in the price of milk — but without other spikes to compare that one to there is no way to know if the variables change together.

Similarly, many relationships are not testable because you can't find a variable in the real world. For example, trying to compare people in the United States who own TVs to those who do not is impossible because almost everyone has a TV.

Fourth, random events occur. Just look at a plot of the Dow Jones Industrial Average. While there are obvious overall trends up and down over long time periods likes months, smaller time periods show erratic fluctuations that are not easily explained (despite the daily judgments of stock analysts).

With human behavior, there are many phenomena that we cannot test or observe. While we may ask people their opinions, we cannot know for sure if that's what's going on in their head. However, you'll see that we can test for relations between what people say they will do and their actual behavior. Thus, we can know if the way we measure opinion relates to behavior.

Chapter 7

Variables and Measures

Once you have focused your needs by creating research questions or hypotheses, you need to clearly define the variables contained in them. In fact, if you can't clearly define variables, you need to go back and rework your RQs or Hs. This involves more than just naming the variables. It involves coming up with clear definitions of what you mean by each variable, including how you will measure each.

The Importance of Variables

Understanding variables cannot be stressed enough. By defining your variables clearly and precisely you will know what kind of data the project will produce. Of course, you won't know the exact numbers (until you do the research), but you should know whether you will be analyzing percentages or means. In addition, those clear and precise definitions will allow you or others to replicate your study if necessary.

A *variable* is a simple concept in some ways. It is simply anything that *varies* or *changes*. All you need is at least two categories (such as male/female or read the newsletter/did not read the newsletter). You can also have an infinite number of responses as in "dollars of income" or different words or phrases. While simple in definition, variables are not always easy to define or recognize.

Operationalizing Variables

Once you have focused your needs into RQs or Hs, you are at the point of considering various types of research to test them. But before that you need to be very specific in defining your variables. Without those definitions you won't know what methods or analyses are appropriate.

For instance, measuring average income is very different from the effect of an ad. Variables need to be translated into specific questions, scales or observations. These need to be straightforward and easy for respondents to understand. That means creating questionnaires and other measuring instruments (see Chapters 14 and 15).

Operationalization means to create a definition for a variable that can be used in research — one that relates to the research question and meets your goals. In other words, you put the variable into operation.

Let's take the following RQ: "How much money is expected to be spent on shoes in the next year?" The only variable is "expected shoe expenditure." An operational definition could be the following question in a survey:

> "How much money do you expect to spend on shoes in the next 12 months? $0 to $100, $101 to $200, $201 to $300, Over $300."

This obviously meets the requirements for an operational definition (assuming the goal is to obtain percentage estimates for each category). This is not the only possible definition. Wording of the question could be different and the categories could be coded differently depending on the goals of the research. If your advertiser says they need to know the average income of your target audience, then categories would not work. So you would change the question to:

> "How much money do you expect to spend on dress suits in the next 12 months?" (Write down response in dollars.)

Some variables may be much more complicated. Take the following research question: "How much news media coverage did my promotional campaign generate?" The variable, "news media coverage," can be defined many ways. In some definitions, it is a simple single variable. In others, it may turn into multiple variables. Is it:

- Total number of stories?
- Number of stories broken down by media (TV vs. radio vs. Internet, etc.)?

- Amount of coverage (time or lineage) broken down by media?
- Amount of increase in coverage after vs. before the campaign?
- Broken down by time period (one week after, two weeks after, three weeks after) to observe when increases and drop offs occur?

Notice there are multiple variables in the definition below: total number of stories for all media, number of stories in TV, number of stories in daily paper, etc.

> Monitor all local media for the four weeks following the start of the campaign (record TV and radio, collect papers, download local news Web pages, etc.). Count the number of stories in each medium (daily paper, weekly paper, local magazine, radio news, TV news, local Internet) using two coders. Compile the number of stories for each medium and also record the total number of stories for all media.

Operationalizations often need a *time parameter* to be useful. Without it a respondent may be confused yet still give an answer. If the operationalization above had no time parameter, then you and others would not know the meaning of results. If a report said "There were 17 stories in local TV newscasts," does that mean in one week or six months or forever?

Even more complex are variables about opinions and attitudes that are usually measured as a scale (see Chapter 15). An operational definition for a scale might be:

> Give employees the "20-item trust scale" ("I believe the company newsletter," "I cannot believe what management tells me," etc.) using a five-item response (strongly agree, agree, neutral, disagree, strongly disagree). Code the responses 1 to 5 so that "5" means more trust, and sum the responses for a scale score so that higher numbers mean more trust.

As long as you know what variables are in your Hs or RQs, have very specific and clear operationalizations and are confident that those operationalizations will produce the types of numbers or words that can be used to achieve your goals, then you can proceed to the methods to collect those data. You need to be very clear in your own mind, not just in the words of a definition. The rest of this chapter covers the specifics of measurement and some of the pitfalls.

Measurement

Measurement is how you plan to categorize, number, or otherwise code the observations you make for each variable. While this sounds esoteric, it is usually

simple. Are you going to make a record of words, or numbers, or categories? The importance of this is that what you decide determines what kind of analysis you can do. For example, if you have categories you will probably end up with percentages, but if you have real numbers you will do means (averages), and if you have words you could just list them.

Your operationalization will determine how you write questions and responses. Clearly, there are many different styles you can use, but they should relate back to your problem statement. For example, if you were an account executive for a TV station, you might need to know "income" as actual dollars because your advertisers want to know the average income of your audience to make sure your programming fits their target. It is equally possible that they just want to know what percentage of households in your audience have annual incomes over $75,000. In the former you would need to ask real dollar amount, but in the latter you would only need to ask in categories. The following shows two ways to measure income. The first is in real numbers and the second is in categories.

Please write down your annual household income from all sources:
$_____

What is your annual household income from all sources? (CHECK ONE)
- ☐ $0 to $15,000
- ☐ $15,001 to $30,000
- ☐ $30,001 or more

Here is another example of the two ways to measure a variable — this time using campaign recall. In this telephone questionnaire example, two questions are used to measure one variable. The first question screens for whether the person saw the ad, and the second elicits what they remember if they saw it. Question 1 is categories, question 2 is in real numbers (note "TOTAL").

1. Please tell me whether you saw any television advertising for XYZ Company in the last week.
   ☐ YES, SAW ADVERTISING
   ☐ NO, DID NOT SEE ADVERTISING/DON'T KNOW

2. IF YES: What do you remember from the advertising you saw for XYZ Company? [WRITE DOWN EXACT COMMENTS]

TOTAL NUMBER OF ITEMS REMEMBERED:_____
(NO/DON'T KNOW TO QUESTION ONE=0)

If your operationalization seeks only to measure whether people saw the ad, then the first question alone would elicit that information. However, if your operationalization defines the variable as the "number of items people remember," then you would use both questions and compute a total for each respondent.

Mutually Exclusive & Exhaustive Variables

When creating responses, make sure you don't have any overlap and that all possible categories are represented. Being *mutually exclusive* means that responses can't fit into more than one category — i.e., they don't overlap. The following example is not mutually exclusive. You would not use the following categories for income because there is overlap. Would "$20,000" be low or medium? In other words, the categories are *not* mutually exclusive.

☐ $0 to $20,000 (low)
☐ $20,000 to $30,000 (medium)
☐ over $30,000 (high)

Being *exhaustive* means that all possible responses are covered. The following example is *not* exhaustive. You would not use the following categories because they do not "exhaust" the possible responses; e.g., where would you check off "$75,000"?

☐ $0 to $20,000 (low)
☐ $20,001 to $30,000 (medium)
☐ $30,001 to $40,000 (high)

So far we have only looked at categories vs. real numbers. Statisticians use a more precise division that can be useful when using rank-order, scales and advanced analyses. The following section describes that system.

Traditional Levels of Measurement

Levels of measurement refers to a system for determining if the measure is at the "level" that is required by your operationalization. Additionally, the level determines what analysis you can do along with what statistical tests and other estimates you can carry out. The system moves from "categories" to "ordered categories" to "arithmetic intervals" to "real numbers." These levels are named nominal, ordinal, interval and ratio. Nominal is considered "lowest" or least precise,

Table 7.1
EXAMPLES OF FOUR LEVELS OF MEASUREMENT

Nominal	Ordinal	Interval	Ratio
Male/Female	High/low/medium	IQ	Number of hours
Religious Affiliation	Positive, neutral, negative	Temperature	Number of technologies owned
Occupation	Good/fair/ poor	On a scale of 1 to 10	Expected $ spent on shoes next year
Words/phrases	Top/middle/ bottom		Age

and the levels increase in precision until reaching ratio. Examples are in Table 7.1.

Nominal is two or more response categories with qualitative, not quantitative, differences. Typical nominal variable include gender (male/female), job title and religious affiliation (Protestant, Catholic, Jewish, Muslim, etc.).

Ordinal is two or more responses categories that can be rank ordered. Common ordinal variables include intent to purchase a product (low, medium, or high) and attitude toward a product or service (positive, neutral, negative).

Interval is responses that have equal intervals between the responses. This is similar to ratio level, but there is no real "0." IQ and temperature are two examples. Many scales are interval level of measurement (see Chapter 15).

Ratio is responses with equal intervals, plus the "0" response actually means "none." There are a lot of ratio level variables. Age, time spent watching TV, are examples. An amount is usually ratio, such as dollars spent on suits in the previous year or the number of items remembered from an ad.

APPLIED RESEARCH AND LEVELS OF MEASUREMENT

While academicians pay attention to four levels of measurement because they extensively use advanced statistics, most managers and professionals are simply

Table 7.2
EXAMPLE OF DESCRIPTIVE TABLE

Table A: Rating of Factor Importance for Choosing a Hospital

	Average rating
Has the latest technology	XX.X
Has qualified physicians	XX.X
Nurses are competent	XX.X
They are friendly	XX.X

concerned with percentages or averages. They need answers to practical questions like, "What is the average income of my target audience?" or "Who attends concerts more often, males or females?" So they are only concerned with whether the measurement is categorical or numerical.

If you look at the levels of measurement in Table 7.1 you will see that there are two levels for which you have categorical responses — nominal and ordinal — and two for which there are responses with equal intervals — interval and ratio. For most industry applications, then, there are only two types of measures for variables: categorical (nominal and ordinal) and numerical (interval and ratio).

Levels of Measurement and Analysis

Once you have operationalized and know your levels of measurement, you should know what analysis to expect. You'll know if you will be calculating percentages or averages to describe the results for each variable. Later, in Chapters 23 and 24, you will learn that the relational and statistical tests you perform also depend on the levels of measurement. Thus, you should be able to create tentative tables to display the results.

For example, if your RQ is "What are the reasons people use in selecting which hospital to go to?" and you use a list of reasons with hospital users evaluating each factor on a scale of one (lowest) to ten (highest importance), you know that the level of measurement is "interval," and you will be calculating averages. Thus, you can make a descriptive table that would look like Table 7.2.

The relational example in Table 7.3 is similar to Table 7.2 except that the RQ

Table 7.3
EXAMPLE OF RELATIONAL TABLE

Table B: Relation of Factor Importance to Geographic Area

	Central city	Near-Suburb	Far-Suburb
Has the latest technology	XX.X	XX.X	XX.X
Has qualified physicians	XX.X	XX.X	XX.X
Nurses are competent	XX.X	XX.X	XX.X
They are friendly	XX.X	XX.X	XX.X

asks about comparing factors among the three geographic areas based on the RQ: "Does the importance of factors for selecting a hospital vary between the central city and its two suburbs?" You would have an average for each geographic area.

GOOD OPERATIONALIZATIONS

There is no perfect or best operationalization. Many definitions and many measures can be used. But if you can't create an operational definition for a variable that someone else can understand well enough to use in another study, then your variable should not be used. Realize that many operationalizations may be appropriate for your goals. The ultimate operationalization is the question or observation along with measures that is used in a survey or other study. The test of the quality of that operationalization is whether it works in your pre-test and final study.

POOR OPERATIONALIZATIONS

Without good operationalizations, your study will make no sense to you or to others. Poorly defined variables lead to poorly constructed questionnaires and poorly designed studies. Consequently, the results of such studies are highly questionable, and decisions based on those results can leave you with unfulfilled goals. The following examples of poor operationalizations come from an internal communication study conducted where I was once employed. These examples are

taken from that questionnaire, but the name of the company has been deleted.

> How frequently, occasionally, or rarely do you listen to the radio?
>
> ☐ Frequently ☐ Occasionally ☐ Rarely ☐ Never ☐ Don't know

The categories above are too vague to be useful in most studies, because there is no time parameter and distinguishing between the categories can be difficult. Try to imagine how you would use the results. If 45 percent of employees checked "frequently" how could that be useful? A better way is to ask respondents the actual amount of time they spend listening to the radio (e.g., in minutes or hours of use on an average day or previous day).

Here's another example of poor operationalization.

> What form of communication among the different segments of [name of organization]'s employees would you prefer?
>
> ☐ Vertical, upward
> ☐ Vertical, downward
> ☐ Horizontal, one-way
> ☐ Horizontal, two-way
> ☐ Vertical and horizontal, both ways
> ☐ Informal, unstructured
> ☐ Formal, structured
> ☐ Both formal & informal, unstructured & structured, both ways
> ☐ Don't know
> ☐ No response

Even with a background in research I could not figure out what the categories meant in this question. I can't even think of a revision that would make this a useful question.

Here's another question with problems.

> How well run is [name of organization] in your opinion? That is, do you think it is run on a sound business basis?
>
> ☐ Fairly well run
> ☐ Very well run
> ☐ Run fairly well in some ways but not in others
> ☐ Don't know
> ☐ No response

The above question is both confusing and extremely biased. The confusion arises because it contains two different questions. Which question should I answer? The second question seems to require a "yes" or "no," but the responses seem to relate to the first part. The bias arises because the responses available do not include negative options such as "not well run." Consequently, the report might say, "There were no negative responses to how well [name of organization] is run on a business basis." At best, such a conclusion is erroneous. At worst, the organization wrote this question deliberately to obtain a false conclusion that could then be reported to its board of directors.

Chapter 8

Validity and Reliability

Once you have operationalized your variables, you will need to take a hard look at whether your definitions "make sense." In the research world we call this examining *validity* and *reliability*. This examination, before pre-testing, can help you verify whether your operationalizations are usable. Then, gathering data about your variables during pre-testing will give you further evidence about the validity and reliability of your operationalizations.

In simplest terms, *validity* is whether you are measuring what you think you're measuring. Clearly, asking a question about income is presumed to measure income, not social status; using a scale to measure perceived image of a company should measure image, not purchase behavior.

Reliability is whether your measures will produce the same results regardless of the location or time of your study (assuming location and time are not variables in your study). You should get the same answer if you ask a person's age in their home or on the street; you should get the same answer if you ask a person's age this morning or this evening. If you get different answers, then the measure is said not to be reliable.

While the discussion that follows may seem esoteric, it is important to understand these concepts if you want accurate and usable research. Your ability to make better operationalizations depends upon having both valid and reliable measures.

Types of Validity

There are many types of validity, but they all focus on how successful you have been in operationalizing your variables.

Think about what might be valid and invalid ways to define variables. You might argue that asking people to tell you whether or not they like "contemporary hit radio" music is not valid because most people don't define "contemporary hit radio" the same as broadcasters. Conversely, you might argue that asking people whether or not they like "country & western" music is valid because most people define "country & western" the same as broadcasters. You may or may not be right, but this is what we mean by assess the validity of variables or measures.

Face validity means that, intuitively, the question or response categories (your operationalization) appears to measure what it is supposed to measure. It has, in other words, face value.

Predictive validity is how well the variable predicts behavior. This is not just finding relations, but it is an assertion about whether the variable is capable of being used to predict relations.

Construct validity means that the measures have been constructed well. Usually this means that the variable's definition has been used successfully in previous research or is based on good theory. This concept lays a basis for replication of research since many researchers are using the same definition for a variable so that results can be compared. For example, since the 1950s the "Roper question" has been used to identify information sources: "Where do you get most of your news about what's going on in the world today?" This question has been used for hundreds of studies and to compare results from those studies.

Content validity is how much your variable matches the concept you're really trying to measure. Sometimes your definition will be too narrow and you will have to rewrite your operationalization or you may need to ask more questions or use a scale. You often need experts to determine if your measure is appropriate. For example, if you wanted to assess how well employees understand the legal policies associated with their job, you might have an attorney look over your items or questions to make sure you have covered the appropriate legal areas correctly.

Researchers have proposed other forms of validity, and sometimes they group or name these concepts differently, such as combining content and face validity, but the important thing to remember is to go through a process whereby you are initially skeptical of your operationalization. You become less skeptical once you have considered face, construct and other validity.

Internal Validity

Internal validity is the extent to which the results of research can be related to the variables that were used. In other words, is there a link between the variables and the results or has something else caused the results? It does not refer to arguments about the usability of the variables like those in the previous section. Rather it focuses on factors during the research that can affect the study itself. Researchers have discovered many factors that can interfere with the validity of the study, including history, maturation, testing, instrumentation, regression, mortality and selection bias.

History

Has something happened during the study to alter the results? Suppose you were assessing the relation between the image of your bank and people's interest in using your bank's brokerage services, but halfway through the week of the study there was a major stock market crash. You might expect their responses would be different just because of the crash. If there were a natural disaster you might expect people to alter their shopping behavior. Remember how "Y2K" caused some people to purchase electrical generators and other survival equipment? You should pay special attention to news and events, especially disasters, that may influence responses or behavior.

Maturation

This refers to the passage of time during the study. People get older. People get tired. This can be a special problem for longitudinal research. If you were evaluating the impact of your promotional campaign that attempted to get people to exercise more, week one may show an increase, but weeks two to four might exhibit no change in activity simply due to people reaching a plateau, not a failure in your campaign.

Testing

This is the effect of participating in a study. Think about how you change when you take a test as opposed to showing up for lecture. This can be a particular problem when looking at trends or when using a pre-test/post-test experimental design. Think back to the last election for your local school

board. Imagine that you were surveyed about what you thought about the candidates. Just the act of asking you questions would sensitize you to the topic, and you might pay more attention to news coverage of the candidates. Then, the next survey would find you an informed voter when you wouldn't be otherwise.

Instrumentation

This refers to changes in a response that occur because of changes in the instrument or the observer. For example, if an interviewer is sick the second day of a study, she or he may ask questions differently than on other days. If the cards that list scale items for a personal interview get sticky through handling, then people may respond differently to "icky" items.

Regression

This is a statistical "law" that extreme positions tend to move toward the average of the group. Consider a campaign that tries to get people who use the least amount of toothpaste to use more. When surveyed a second time, those who are on the extreme ends of usage (both high and low users) will actually tend to move toward the mean (be less extreme). This means that if you survey just low users, you may incorrectly conclude that an advertising campaign is responsible for increased usage of your product when, in fact, there has been no effect. You need to measure the entire population to control for this problem.

Mortality

This refers to the drop out rate of participatants. This is more likely to affect longitudinal studies and experiments. Literally, people could die. But there are other reasons for people to drop out of your study: lack of interest, boredom or inconvenience. Imagine if all the subjects in your study were just those who had the most interest in your topic. Your study would be biased because those with less interest would be unrepresented.

Selection bias

This is the overrepresentation of a particular part of the population. If you place a questionnaire about healthcare issues on the Internet and allow

anyone to fill it out as they wish, then you will end up with responses from only those who have Internet access. If you make phone calls only between 6 p.m. and 9 p.m. then you will miss evening shift workers. If you only use English in your mailing, then you potentially miss a large part of the Hispanic population.

There are other possible internal validity factors, but those above should impress upon you the importance that you need to pay to this matter.

Reliability

To understand *reliability* think of what it means to be reliable. You are a consistently responsible person whether it's today or tomorrow or next week, whether you are at home, at school or at work. What you do is predictable. That should be the same for variables. Variables should consistently measure people's behavior, media habits, opinions and so forth. In other words, you would get a similar answer whether you asked a person inside a building, on the street, this morning or tonight.

Unlike validity, which relies primarily on argument, reliability can be quantitatively assessed, and there are many statistics to do that. Reliability looks at how consistent measures are from observer to observer, internally, over time or from one version to another.

Inter-observer reliability evaluates the consistency between observers using coders (raters or people who assign categories to words) and is especially useful for "content analyses." If you wanted to know how positive news coverage was for your company, you might examine all newspaper articles that mentioned your company name. Some coders might interpret an article as "very positive" while others would say "lukewarm," and so on. It is important that the coders use the same meaning for "positive," "negative," "neutral," etc. You can use a statistic called "intercoder reliability" to correlate their work to test how closely they agree on meanings.

Internal consistency is often used on scales and other multi-item measures. Frequently a "split-half" test is done, comparing odd items with even items. A correlation between the two halves should be very high. Statistics like "alpha," "inter-item correlation" and "item-total correlation" compare how well individual items correlate with the total score on the scale.

Stability (also called *test-retest reliability*) assesses how consistent responses are over time with the same or similar populations. Statistics like correlations are used to estimate how well tests, scales and questionnaires relate across different

time periods.

Cross-test reliability (also called *parallel forms*) takes a large number of items and splits them randomly into two halves. Each half is administered separately with the expectation that the two separate tests are highly correlated. Imagine a professor has generated 100 multiple-choice questions for an exam. If the professor randomly selected 50 for each test, and then half of a class got Test A and the other half Test B, you would expect the correlation between scores on the two tests to be very high if the test was reliable.

A similar test is used for scales whereby a random selection of half the items in the scale is compared with the other half. This is called *split-half reliability*.

Obviously, reliability is best tested statistically when there are multiple items to compare, as with scales, but even individual questions can be examined for reliability over time and space. As is the case with validity, you do not have to be an expert at reliability statistics to recognize reliability problems. If you ask a question during a pre-test and you get vastly different responses for no reason, then you might suspect reliability problems.

External Validity

External validity deals with factors outside your study. These factors affect the ability to generalize to the population from which the sample was selected. External validity examines the extent to which inferences can be made and to whom they can be made. This is important because you must know the limits of your study. Going too far, making imprecise predictions, can lead you to make bad decisions. For instance, if you drew a sample from Albany, New York, you cannot expect it to represent all people in New York State or the United States in general.

External validity is an examination of what can affect *representativeness*; that is, how close does the sample match characteristics of the population in your study. It assesses the factors causing participant bias or problems with the sample.

Reactive effects occur when people's responses or behaviors change because they are sensitized by the research itself. They could change just because they know they are being observed or because they start thinking about a topic they wouldn't normally consider. For instance, if you were conducting surveys with the same people over time and asked questions about Coke vs. Pepsi, you have to wonder if they pay more attention to the taste of their drinks now than they previously did.

Selection biases can occur when people volunteer to participate or you have selected participants that do not reflect or represent the overall population. In experiments if you do not randomly assign subjects to treatments, you run the risk

of people choosing the treatment they like or seems more fun. If you were testing the effect of humorous vs. serious ads and you let people select which one they watched, you might get only serious people viewing the serious ad. Then the effect of the experiment would be caused by the subjects' feelings rather than the ads themselves.

Accuracy & Precision

Two other concepts deserve attention. *Accuracy* refers to the relative amount of error in your research. Think of shooting a rifle at a target: the rifle is your definition of your variable and the target is what you're trying to measure. You want to hit as close to the bull's eye as possible. Errors can arise in many areas. Problems with validity and reliability are just two examples. There is random error associated with selecting samples, and you can calculate how much that error is (see Chapter 20).

Precision is related to accuracy, but it refers to how general or specific the definition of your variable is. Being precise — being more specific — helps you be more accurate. As an example, think about measuring people's attitudes. You could ask one question, but several questions would help you better measure the many dimensions of attitudes.

Precision also relates to the number of responses people can select from. For example, you can ask respondents to "agree or disagree," but allowing a five-point response — "strongly agree, agree, neutral, disagree, strongly disagree" — will allow you to more precisely differentiate subgroups of attitude. A more precise measure would be to ask people to rate "on a scale of 0 percent to 100 percent, where zero percent is no agreement at all and 100 percent is total agreement." However, sometimes people do not or cannot make such fine distinctions and a five-point scale may be accurate enough to meet your research needs.

Controlling Validity and Reliability Problems

Obviously, you want to eliminate validity and reliability problems. If you cannot eliminate them, you would like to account for them. So the more control you have over them the better off you are. Experiments can be designed to either control for or account for them as you will see in Chapter 11. When you cannot do an experiment, you will need to assess the impact of these factors on your study.

Specific designs have specific problems. In nonexperiments it is almost impossible to control external factors. You will have to pay attention to these issues.

Random sampling is one way to control or eliminate some problems, especially selection bias (see Chapters 18 and 19). When doing panel studies you are especially susceptible to the "testing" impact. So you either have to assume the impact is slight or you might design a companion Trend Study to see if there is an impact.

Chapter 9

Relations and Cause & Effect

Now that you have an understanding of the basic concepts for starting a research project — needs, hypotheses and research questions, and defining your variables — it is time to examine two other important concepts.

The first is the *relation* between variables. This is important because that is a top goal of most research. Simple descriptions can tell you something about your audience or market. For example, knowing the average income can help you determine whether your market can afford your service. But knowing if people with higher incomes are more likely to seek your service would be helpful in selecting target audiences, determining appropriate media buys and designing effective campaigns.

Assessing *cause-and-effect* is even better than simply knowing if a relation exists because you can be more confident in predicting how people will behave. For example, you may find a relation — such as employees who read your company newsletter also have a more favorable opinion of management vs. those who don't read it — but it's possible that newsletter reading may not have *caused* that opinion. It may be just as likely that the opposite is true, that the favorable opinion of management caused people to read the newsletter. Knowing which variable is the cause and which is the effect will help you determine whether it's worth expending company resources on the newsletter and campaign to get employees to read it.

There are times, however, when it is impossible to determine cause-and-effect. For example, you will see in Chapter 11 that random assignment is essential

in experiments to determine cause-and-effect, but you can't randomly assign income in an experiment. The most you can know is that there is a relation by observing differences between different income levels. In such situations you will have to rely on the relation as the best evidence for inferring cause-and-effect.

Relations

A *relation* requires two or more variables changing together — as one of the variables changes, so does the other variable. There are many examples. There is a relation between education and income — as education increases so does income. There is a relation between television viewing and academic grades — as TV viewing increases, grade-point average decreases. There is a relation between gender and technology adoption — males are more likely to adopt new technologies than females. Then there are relations we would *like* to find, such as the one between an advertising campaign and actual sales (i.e., as attention to the advertising increases, sales increase).

Researchers are careful to distinguish between different types of relations because we are not just interested in change but *how* things change: do they go up together, down together or opposite each other? Researchers have the following specific terms for these relations:

> *Positive relation*. As the values of one variable increase, the values of the other also increase. For example, as the years of education increase, income also increases. Researchers would say, "Education is positively related to income."
>
> *Negative relation*. As the values of one variable increase, the values of the other decrease. For example, as the hours of TV viewing per day increase, the minutes spent reading newspapers decrease. Researchers would say, "TV viewing is negatively related to newspaper reading."
>
> *No relation*. As the values of one variable increase, the values of the other stay the same or change randomly. For example, as a person's intelligence (IQ) increases, height changes randomly. Researchers would say, "There is no relation between IQ and height."

Of course, you can't have positive or negative relations when one or more of the variables has no order, such as gender (gender cannot increase or decrease; you cannot have more or less gender). With these variables you either have or do not have a relation as exemplified by the following.

Relation. As the values (categories) of one variable change, the values of the other also change. For example, married people are more likely to own a home than singles. Researchers would say, "There is a relation between marital status and home ownership."

No relation. As the values (categories) of one variable change, the values (categories) of the other do not change. For example, males are just as likely as females to drink espresso. Researchers would say, "There is no relation between gender and espresso consumption."

These positive and negative relations will come up again in Chapter 23's coverage of correlation.

Cause-and-effect

Relations have limited use for inferring cause-and-effect. All the relation tells you is whether the values of two variables rise or fall together. Cause must specify that an independent variable causes a dependent variable, not the other way around, *and* that there aren't other causes.

Consider, for example, the following relation: "Happier people are healthier people." If you interpret this to mean that being happy causes people to be healthy, then you would design a campaign to teach people how to be happy, expecting that they then would end up being healthy. But flipping that around — "Healthier people are happier people" — is just as reasonable a statement as the previous one. You then expect that being healthy causes people to be happy. In this case, you would design a campaign to teach people healthy lifestyles expecting that they would then end up happy. Without knowing which causes what, you don't know which campaign to pursue.

There are many examples of relations in which it is difficult to tell what causes what. For example, "Children who watch more violent television programs are more likely to commit crimes." Or is it, "Children who commit more crimes are more likely to watch violent television programs?" An alternative explanation is that there is another variable causing the effect; "Unsupervised children are more likely to watch violent television *and* are more likely to commit crimes than supervised children."

An important consideration for communication professionals is to determine whether a campaign caused an outcome. For example, if you are selling a product, you would certainly want to know whether (a) "People who paid more attention to my media campaign are more likely to buy my product" or (b) "People who buy my

product are more likely to pay attention to my media campaign?"

So how do you know which is the cause and which is the effect in a relation? You have to show that one of the variables is the cause (the IV — independent variable) and the other variable is the effect (the DV — dependent variable). You demonstrate this by satisfying the three conditions of cause-and-effect:

1. *Time order* — one variable must precede another in time.
2. *Relationship* — the two variables are statistically related or correlated.
3. *Elimination of other causes* — the IV selected is responsible for the correlation with the DV instead of other independent variables.

For *time order*, you can control when people are exposed to the independent variable (as in an experiment), or you can demonstrate logically that the one variable preceded the other. For example, it is logical that gender precedes income. We are born male or female, and changes in income usually do not change our sex.

Relationships are demonstrated by conducting a quantitative study, and usually using a test to demonstrate statistical significance which shows there is a relationship or correlation (see Chapter 24).

Elimination of other possible causes is often the most difficult because it requires controlling people and their environment. Some controls are clearly impossible. You cannot control the home environment for a telephone survey. Experiments provide the best controls, but in situations in which you cannot conduct an experiment, you can use longitudinal designs to account for other variables. If you suspect some variables might be causes then you can include them in your study and statistically account (i.e., control) for them.

Let's assume you believe that a new corporate magazine will increase morale and, thus, increase productivity of your account executives or sales staff. You assume that "before and after publishing the magazine" is the IV and the "account executive's sales volume" is the DV. Could you demonstrate cause-and-effect by comparing sales volume of one week before with two weeks after you introduced the corporate magazine (assuming sales volume increased)? Not definitively. Why not?

- Have you satisfied time order? Yes, you showed that changes in sales volume occurred after introduction of the magazine.

- Have you demonstrated a relation between communication and sales volume? Yes, assuming you found a statistical relation between your variables. As time changes (before vs. after) so did sales volume, and it is a positive relation.

- Have you eliminated other factors? No! Think of the other possible variables that can account for increases in sales volume. Did the economy get better? Did a competitor go out of business? Did changes in the weather change buying habits? If you take these variables into account and showed no relation between them and sales volume, then you have a stronger case for cause-and-effect.

Despite having problems with the impact of other factors, you can still present evidence — and sometimes the only evidence possible — by showing time-order and relation. Both are vital components of cause-and-effect. And when making decisions, use your best evidence. Just keep in mind the possibility that other factors may impact the findings.

Chapter 10

Qualitative Designs

Once you have clearly specified your needs, goals, research questions (RQs), hypotheses (Hs) and operationalizations, you are ready to consider the nature of the research design and data collection method. Keep in mind that "design" is different from "data collection technique." For example, while you may eventually do a mail survey, selecting whether to do a survey is a different consideration from choosing to do mail. That is, the design you choose (focus group, cross-sectional survey, experiment, in-depth interview, etc.) is separate from your data collection technique (mail, phone, e-mail, in-person, etc.).

Qualitative and quantitative designs are usually considered separately. This chapter covers qualitative designs. Chapters 11 and 12 cover quantitative experiments and surveys. Chapter 13 covers data collection techniques.

The term "qualitative" has slightly different meanings to different types of researchers. For example, some call a survey qualitative if it doesn't use a random sample while others call all surveys quantitative because surveys are usually used to collect numerical data. Even some marketing researchers attach a different meaning to qualitative, defining it as having "higher quality" data. The most popular definition is that *qualitative* is a study that involves collecting nonsample-based descriptive data. You'll see in the succeeding chapters that I define all surveys and experiments as "quantitative," and I require that they are based on random samples or random assignment. Thus, a "survey" that used a *convenience sample* — a form of nonrandom sampling — would not qualify as a "survey" under my definition.

Instead, I would call it a "convenience study," which will be discussed in this chapter.

Before examining qualitative designs, you should understand that there is a place for *informal* research as well as research based on the 15 steps in the *formal* research plan described in Chapter 3.

Informal vs. Formal Research

Informal research is any attempt to gather information that is not guided by a research plan. It is timely, inexpensive and easy to conduct. You don't need any special expertise to do it, but you often get serendipitous results. Of course, it is limited to the specific interactions or information peculiar to that situation. For example, asking a consumer to read advertising copy will tell you whether there are major problems understanding the writing, but it will not tell you whether the ad appeals to your target market. Informal research includes:

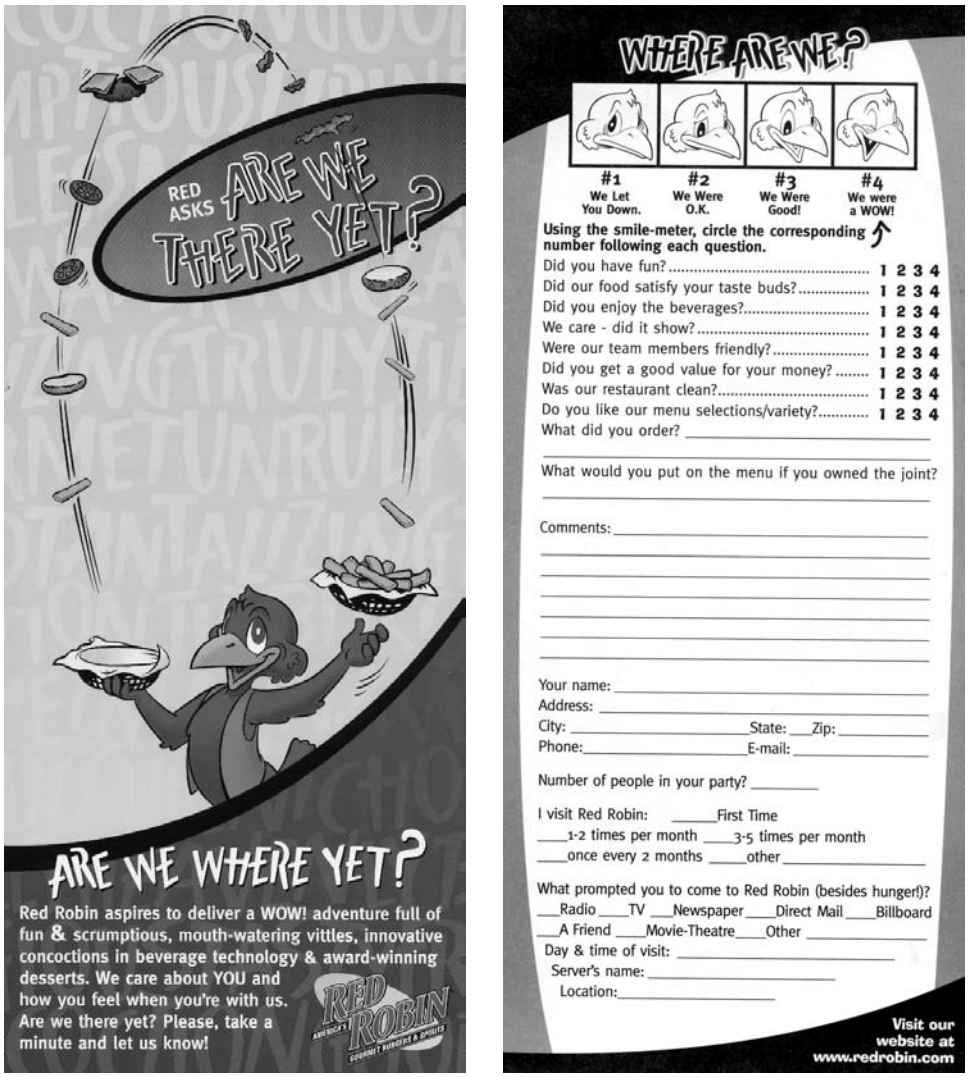
- Unsolicited customer or employee comments
- Reading competitors' newspaper ads over coffee
- Reading trade publications
- Talking with colleagues
- Chatting with some employees

Informal research can be useful because it helps reduce our biases, our narrow views of the world. It makes us aware of divergent views and behaviors. It can be used quickly and easily to get opinions about things like newsletter copy or new packaging. It can reveal potential problems. By its nature, informal research is difficult to replicate. Try to imagine duplicating a research project that involves "talking to a few people on the street to get some new ideas." An example of informal research is the Red Robin customer comment card in Figure 10.1.

Formal research follows a step-by-step research plan so that it is well focused and designed to fit your needs and goals. It can be either quantitative or qualitative. What makes it formal is that it has a purpose and follows a well-defined set of procedures. It requires planning time, execution and analysis time, money and expertise. But that investment usually produces more accurate judgments of target population characteristics, behavior, attitudes, opinions and so on. Formal research includes, but is not limited to:

- Experiments
- Surveys

Figure 10.1
RED ROBIN CUSTOMER COMMENT CARD
(Used by permission of Red Robin International, Inc.)



- Focus groups
- Intercepts
- Case studies

The value of formal research is that it can be representative of your target population and involves a process that others can follow. Consequently, you are very confident that estimates you get for your target population are accurate.

Is formal research scientific? Yes. Experiments and surveys are scientific because they adhere to systematic procedures and accepted practices that have been verified through a long history of research applications in academia and in business research (see Chapter 1 on what constitutes science). The most important aspect of scientific research is that it be replicable — that is, you and others know the procedures and operationalizations of the original study well enough to be able to duplicate it in order to extend that research or confirm the original findings. This is especially useful when you want to see if people's attitudes or behavior have changed. Scientific research usually requires "representative" samples.

Most qualitative research, on the other hand, is not scientific because it is not representative of a population. For example, case studies are open to the idiosyncratic interpretation of the person reading. Those idiosyncracies are impossible to replicate. In another example, if you did two convenience studies, one at a mall and one at a university, you would get different average ages, incomes, educational levels and other characteristics, neither of which would be representative of the overall population. Nevertheless, nonscientific research is useful because it yields ideas that can stimulate creative approaches to a problem.

Regardless of whether it's formal or informal, keep in mind that unfocused research tends to be inefficient. Merely sitting in a restaurant to pick up stray comments may or may not be useful. You could sit all day and not learn anything. If, however, you first identify a potential problem with service whereby you choose to sit in a restaurant to observe service and listen for potential comments about the staff then the endeavor has purpose.

What is Qualitative Design?

Qualitative research tends to be exploratory in nature, and since it is not usually representative it cannot be used to infer behavior or characteristics in the target population. However, qualitative research makes up for this deficiency by eliciting depth of thought and breadth of comments and ideas.

Qualitative can be especially useful when you have no idea where to start, such as when you haven't a clue about what your employees think about your company or what your market thinks about your product. It can also be useful for developing topics for study and questionnaire items that can be used in later quantitative studies.

Qualitative usually refers to designs intended to elicit words rather than numbers and is almost always descriptive. That is, you cannot test whether there are relations or cause-and-effect. However, qualitative studies often suggest relations that you can test later in quantitative designs.

If your variables tend to be "open-ended" (soliciting words and comments rather than short responses) and your research questions focus on discovering ideas or you just want to know what people are saying, then you probably want to use one of the qualitative designs. As there are several to choose from, you will need to match the design to your RQs and operationalizations. For example, the following two research questions dictate very different designs.

RQ1: What do people think about when considering where to go on vacation?
(I need some new ideas for a resort's campaign.)

RQ2: What new bakery products might people like?
(I own a single bakery in a Dallas suburb.)

In the first question, you assume people have taken vacations and already have some ideas about what they want, so you would just ask about existing ideas. For the second question, people may not have given much thought to a new bakery product. So getting them to talk about what they like and dislike, responding to what others like and dislike, and coming up with appetizing ideas would be more useful.

Small Sample Studies

Small sample studies are just that, small groups — usually less than 20 participants. They may be randomly selected or not, but because of the small size you cannot make accurate generalizations. Regardless, they can be useful for generating comments — e.g., hearing the language people use to describe your product and giving you new ideas. They can generate comments about anything, including your service, your competitors, your communication style and so on.

However, to be more useful, these comments need to be focused. For example, if you were developing a scale to measure the image of your television station, you might use small samples in two ways. First, you could use a small sample of about 20 people and interview them on the phone to ask, in an open-ended way, what they think about TV in general, the stations in the market, your station, the personalities in the market, etc. Second, using their phrases you could develop a "TV image scale," but you'll need to test it to make sure it works, again using a small sample.

In-Depth Interviews

In-depth interviews (sometimes called *depth interviews*) are usually conducted one-on-one — that is, one interviewer and one interviewee. They get into people's minds beyond "top-of-mind" responses. Instead of just finding out "I like it" or "It's just OK" or "They do a good job," you can probe for why people said what they did, and you can keep on probing. Those probes may produce other comments and insights that the respondent would never have mentioned without the probes. Interviews can last an hour or more and usually end when no new ideas are forthcoming. Most in-depth interviews are recorded.

This is similar to focus groups, below, but the advantage is that each individual is free to say what they want without being interrupted and without having to expose their comments to scrutiny and judgment from other people. They can speak more frankly about sensitive topics.

Doing in-depth interviews requires formal preparation — identifying problems and writing an initial set of relevant questions to begin the interview. Data collection is achieved by asking the participant a couple of questions and then letting the answers guide the discussion. It is important that interviewer biases are kept in check by letting the participant guide the discussion. Normally a small number of interviews is done, from two to seven.

Analysis is difficult because each interview is unique. Usually you receive a transcript or recording to review. Since the purpose is exploratory, you look for ideas or comments you haven't heard before, such as, "I just don't trust filling out the company's parking sticker form" or "I'm embarrassed buying adult diapers."

How do you get people to participate? If it's a homogeneous group, like a business association or set of employees, then a small random sample can be drawn from a list of members or employees. If it's a general population study, you can draw a sample of telephone numbers (see Chapters 18 and 19 for sampling). Usually you will offer an incentive to get people to participate, such as a couple of hours off work for employees or a monetary inducement (as high as $100 or more for a general population study). In-depth interviews can be especially useful for talking about delicate subjects like:

- Adult diapers
- Employee comments about the department head
- Extreme political issues
- Relatives
- Medical issues
- Sexual habits

Convenience Studies

If you interview people simply because they appear at a convenient location, it is called a *convenience study*. This includes meeting halls, community centers, work sites, shopping malls ("mall intercept"), or schools. Electronic locations are also used through Internet sites and bulk e-mail lists.

The apparent advantage of these studies is that large numbers of people can be interviewed quickly at very low cost. However, the lack of representativeness of these groups to a larger population makes them suspect if used as a substitute for a scientific survey. You could interview 300 or more people in just a few hours, but those interviews often will represent a narrow group of people, not the general population. For example, if the interviews are collected at a shopping mall, people who don't shop at that mall never get interviewed; if at a community center, people without a special interest in community activities will be unrepresented.

The advantage of the convenience sample is that you can do quick and inexpensive explorations of ideas, messages or visuals (print ads, videos, packaging and the like). For example, you could do some initial testing of product packaging. Suppose you created a new type of wood sealant along with an artist's mock-ups of several package styles that were pasted on the outside of the cans. Intercepting people at a mall, you could recruit them to view each mock-up. They could answer recall questions about the brand, pictures and copy, and make other comments. If there were problems understanding the wording or with other aspects of the packaging, you could rework your mock-ups and test again.

Suppose you wanted to taste test a new food product. Often a concern is that the new product taste is substitutable for its competition. Obviously, personal interviews with a large random sample are too expensive, so you could use convenient locations where people eat or buy the product.

Remember, even with a large number of interviews, convenience studies are not representative and cannot be used to estimate behavior, attitudes or perceptions in the general population, and they cannot be used to estimate things like sales and changes in image.

Case Studies

A *case study* is exactly what it says — examining a case or example to get ideas. But you do not casually stroll through cases to generate ideas. You formulate a problem statement and make a search for relevant cases that may provide insight into your problem.

The difficulty might be in finding relevant cases. Business and academic associations and some business journals publish case studies. Associations often provide cases in print and now in a search mode on the Internet. For example, the International Association of Business Communicators publishes the annual "Gold Quill Winning Workplans." If you were a member you could access hundreds of cases.

Suppose you work for a property development company that is in the unenviable position of having to move elderly tenants out of their homes to make way for new construction. You would like to prepare yourself with ideas to deal with media should some tenants balk at moving. You'd like to find cases from others who have dealt with similar problems. I tried the following online. Of course, future searches may produce different results.

- Find a search engine: www.google.com.
- Enter keywords: elderly tenants "negative publicity" case study.
- First ten hits produce nine case studies of negative publicity.
- One hit, "Handling a Media Crisis," exactly matches negative publicity associated with the eviction of elderly tenants.

An Introduction to Focus Groups

Focus groups are what the phrase implies: groups in a dialogue or discussion that move from a general discussion of a topic to a focused discussion of that topic. Important also is to move from what an individual can think up on her own to how individuals react to each others' comments and ideas. Focus groups are very structured, leading the participants through a set of more and more focused questions or topics. They are similar to in-depth interviews in that the purpose is to probe deeper thoughts. You would like to draw out the breadth of the thoughts and the meaning behind the thoughts.

You will have to recruit participants, often offering a monetary incentive. The sizes of focus groups range from as few as seven to as many as 20. Too few means not enough interaction; too many means an uncontrollable mob and not enough time for all to express themselves.

Focus groups need to have structure and control because the group can get off track or a few individuals can dominate the conversation. You will need a moderator (also called monitor or facilitator) who knows how to control the group, when to follow-up important comments, when to close the discussion and move to another question, and when to deviate from the agenda.

You will need to find a room. Many data collection facilities have a focus

Table 10.1
EXAMPLE OF FOCUS GROUP AGENDA

Focus Group Agenda: Participation in Banking Investment Programs

I. Introduction, purpose of the gathering. Screening questionnaires can be filled out at this time. Warm up questions. (Develop commonality of the group.)
  A. Do you have kids? Ages?
  B. What's your favorite ice cream?
  C. Future desires for yourself/kids/retirement?

II. Start discussion
  A. What kind of bank accounts do you have? Why?
  B. What banks do you use/not use? Why/why not?
  C. How is the service? Getting better? Worse? Why?
  D. Other services you'd like to see? Why?

III. Transitions
  A. Do you have stocks? Bonds? Through a broker?
  B. Do you have retirement plans?
  C. Have you heard of using your local bank to buy stocks? Do you do that? Would you? Why/why not?

IV. The real focus
  A. Have you heard of XYZ bank?
  B. What do you think of XYZ bank?
  C. Did you know that they have investment services? How did you hear about it?
  D. Would you use XYZ bank for your investments? Why/why not?

group room with one-way mirrors so you can observe and video record the group. Many local research companies have a focus group room. These facilities are already set up to record the discussions. Because nontextual cues (facial expressions, body movements, etc.) are important, observers should take notes so that scowls, bitterness in the voice and other cues can be associated with the transcript of the interviews.

Focus groups are good for generating ideas and are especially useful for getting the actual language people use to describe your topic. They can be particularly helpful for coming up with wording for questionnaires or scales to be used in a future study. They can also provide language to be used in your promotion or advertising copy.

Since control and structure are important, an agenda is mandatory to help the moderator lead the group to the focus. Note that the agenda example in Table 10.1 is not just a list of topics to discuss but is a plan to lead participants from a general

Figure 10.2
PROJECTION TECHNIQUE FOR PET FOOD
(Used by permission of Phoebe Reagan)

discussion to the specific issue you want information about.

How do you make up focus group questions? Where do the ideas come from? These can be created, in part, just by asking your client and yourself what you want to know. In addition, other qualitative designs can help. For example, you can conduct in-depth interviews with a few employees or ask customers to fill out comment cards to generate ideas.

Discussions and verbal responses are not the only ways to generate ideas and participation. Projective techniques can trigger thoughts (see example in Figure 10.2). These can be used to break the ice and get people involved in the discussion. They can also be used privately to generate responses an individual might not make in a group setting. Projective techniques include:

- Role-playing activities (participants pretend to use the new product)
- Word association ("ABC Company"– ____ ; "fun"– ____)

- Sentence completion ("The best thing about working in this company is ...")
- Pictures, music and other nontext stimuli.

How do you analyze the comments?

Soon after the group is done you will want a transcript of the discussions. Some computer programs exist to do word searches and content analyses. Whether you content-analyze or simply read or scan the transcripts and notes, you must keep your purpose in mind. Are you looking for themes that will assist your creative campaign, language to use in a survey, or some other use? More than one person should examine the transcript so you can verify if your interpretation matches theirs. If you do content analysis, you would compute intercoder reliability to verify that interpretations are consistent.

But use care in interpreting the results. Many professional market researchers who use focus groups caution that this is the method most often misused when the results are applied to evaluation rather than the generation of ideas and messages. Remember that focus groups are not representative of any target. Thus, you cannot estimate sales or other indicators of success.

Table 10.3
CHARACTERISTICS OF QUALITATIVE AND QUANTITATIVE DESIGNS

Qualitative	Quantitative
In-depth responses	Top-of-mind responses
Unexpected results	Control of stimuli and questions
Generates ideas	Good for spotting trends
Simple organization	Good for evaluating campaigns
Inexpensive	Can be very expensive
Difficult to analyze	Easy analysis of numbers
Spontaneous	Not spontaneous
Not replicable	Replicable
	Good for discovering relations/causes
	Good descriptions of the market

Which is Better, Qualitative or Quantitative?

Neither. The important issue is whether you have chosen the appropriate design for your needs, goals, RQs and Hs. The match of characteristics between your needs and the design varies. For example, simplicity is a general advantage of qualitative studies, but some qualitative designs, like focus groups, can be complex to manage and the results difficult to analyze. Table 10.3 compares the overall characteristics of qualitative and quantitative designs.

Chapter 11

Quantitative Design: Experiments

Quantitative designs are usually used to collect numerical data. These include surveys or polls, experiments and most content analyses. In all of these designs, it is possible to collect nonnumerical data ("verbatims" or "open-ended" responses) that can be categorized and used quantitatively, such as the percentage of respondents making negative statements about image.

Experiments

An *experiment* is a test of cause-and-effect with the independent variable being *treatments* or *stimuli,* and the dependent variable being some *observation* of changes in behavior, attitude, opinion, or other variable. The independent variable is assumed to be the cause; the dependent variable is assumed to be the effect. In experiments, the independent variable can be manipulated, and the dependent variable is observed.

The best test of cause-and-effect is an experiment. Since the experimental situation is tightly controlled, you can eliminate many other possible causes of the DV. In Chapter 9, you learned that cause-and-effect has three requirements. Experiments satisfy those requirements by (1) controlling the time-order by first providing the independent variable or stimulus and afterwards measuring the dependent variable or effect; (2) demonstrating a relation with statistical testing of

the relation between the IV and DV; and (3) controlling external factors in two ways: controlling the environment to eliminate external variables (or to make sure the impact of them is the same for all groups) and by random assignment to prevent people's internal variables (values, attitudes, gender, etc.) from causing the outcome.

Classic experiments have an independent variable that uses treatment groups (or stimulus groups) along with a control group that does not get the treatment. Observations are then made of how participants/subjects in each of the groups responded by measuring the subjects' behavior, attitude, knowledge, etc. Each group may contain 20 or more subjects. The experiment is conducted in a "lab," usually a room or auditorium. The groups are compared and an effect is inferred if the groups are statistically different.

Lab experiments are best for controlling the environment. For example, you can control the IV by deciding how much stimulus each subject receives, such as comparing exactly zero, one, and two hours of violent TV viewing. You also control the room temperature, when the experiment takes place and other external factors.

However, there are problems with using a lab environment. It is not "real." Imagine what it is like to watch a TV commercial at home when you can leave the room to get a snack or go to the bathroom vs. watching an ad in a room where there are no distractions and you are under pressure to pay attention. Your behavior would be modified. If being "real" is very important, then *field experiments* are more appropriate. But field experiments are subject to less control and they are often difficult to create (discussed later in this chapter).

Many types of experiments are used in academic research, but true experiments are rarely used in applied communication research (industry research), because they can be difficult and expensive to set up and conduct, and recruiting subjects from the real world is usually very expensive compared with academic experiments that use students as subjects. However, applied experiments can be done if the set-up is simple.

For example, you could test several new layouts (type style, size of columns, etc.) that you are considering for your local newspaper. This is important because a major makeover should require solid evidence before risking a change. A simple experiment would use the layouts as treatments, Layout 1 vs. Layout 2 vs. Control (current layout; see Table 11.1). The observation could be a short questionnaire — administered after participants view their respective layout — that seeks opinions about the newspaper layout and respondent's likelihood of subscribing. Simple experiments like this can be conducted to test different versions of campaigns, print ads, video, news copy, and so on.

Table 11.1
SIMPLE EXPERIMENT TO TEST NEWSPAPER LAYOUT

	Group I	Group II	Control
$Time_1$	Layout 1	Layout 2	Current layout
$Time_2$	Observation	Observation	Observation

QUASI-EXPERIMENTS

There is wide use of *quasi-experiments* (called "quasi-" because they resemble experiments) due to the relative ease with which such studies can be done. You simply observe people before and after presenting a treatment but without a control group.

For example, you could gather 200 people in an auditorium, have them fill out a pre-questionnaire about intended purchase, show them a TV program with your ad embedded, and then have them fill out a post-questionnaire about intended purchase, hoping to find that their intended purchase had changed "because" of your ad. I put "because" in quotes since you can't know definitely if your ad caused the change since this is not a true experiment. This design is often used to test messages and is sometimes called an *auditorium test* because people are recruited to an auditorium or other convenient location to view and respond to a message.

Even if you have two or more groups, if you do not use random assignment it is also called "quasi-experiment." Remember that you can have internal validity problems if you don't maintain experimental control.

Besides their lower cost and simplicity, the advantage of quasi-experiments over true experiments is that they more closely represent actual human behavior. In the real world people are exposed to many messages, not just a single treatment, and they choose what to expose themselves to and, as is common in auditorium tests, people exhibit "normal" behavior such as talking during commercials. Table 11.2 shows the layout of a quasi-experiment.

EXPERIMENTAL DESIGNS

There are literally dozens of experimental designs. Most of the intricate designs are used by academic researchers, but there are several basic designs that are used

Table 11.2
A QUASI-EXPERIMENT

$Time_1$	$Time_2$	$Time_3$
Observation	Stimulus	Observation
Pre-launch survey	Campaign	Post-launch survey

extensively by both academicians and applied researchers. All require random assignment of subjects to be true experiments.

Pretest/Post-Test Control Group

This is a straightforward comparison of at least one group before vs. after receiving a stimulus, along with a control group that is observed at the same time without the stimulus.

Suppose you have created two versions of a TV ad to increase awareness of your Web page. Version 1 is humorous; Version 2 is serious. You would like to know which version increases awareness of your ad the most. You test awareness ($Observation_1$ and $Observation_2$) by asking people if they have ever heard of your Web page, if they've seen it and what they remember about it. You assess effect of the ads by doing the experiment shown in Table 11.3.

First, you observe all three groups by asking about awareness of your Web page. Have they heard about it, seen it and what they remember about it. (This is the pretest.) Second, one group sees the humorous ad, one group sees the serious ad and a control group does not see either ad. Finally, you observe all three groups again with the same questions about awareness.

The value of this design is twofold. First, you can compare the groups to see if they are different. You can tell which group has the most awareness. If the control group has the most, then the ads have probably failed, but if the humorous ad has the most awareness, then it probably has the most effect. Second, you can assess how much change has occurred. That is, you can use $Observation_1$ as a "baseline" to make sure that $Observation_2$ shows an increase, and you can see how much of an increase there is.

The limitation of this design is that you "sensitize" subjects. Once you have asked about awareness, you do not know if the increase in awareness is because subjects are now aware of your Web page or because the groups that

Table 11.3
PRETEST/POST-TEST CONTROL GROUP DESIGN

	Group I	Group II	Control
$Time_1$	$Observation_1$	$Observation_1$	$Observation_1$
$Time_2$	TV ad $version_1$	TV ad $version_2$	Does not view ad
$Time_3$	$Observation_2$	$Observation_2$	$Observation_2$

saw the ads are now paying more attention than they normally would. You can't be sure the change is solely due to your ad.

Post-Test Control Group

This is the same as the previous design, but without the pretest ($Observation_1$). The experiment example used earlier in this chapter in Table 11.1 is such a design.

All groups, including the control, are observed at the same time only after the stimulus has been given. It does not sensitize subjects, but it also does not allow you to assess how much change occurs because of the stimulus.

Solomon Four-Group

This design overcomes the limitations of the previous two. It has the advantage of testing changes (Groups I and II in the example), but it controls for sensitization (Groups III and IV). In other words, you are sure the effect of your ad is due to the ad itself, not sensitization.

The disadvantage of the Solomon design is that it is more complex and more expensive, so you need a very good reason to justify the expense. Table 11.5 shows how you would lay out the experiment.

ADVANTAGES AND DISADVANTAGES OF EXPERIMENTS

Table 11.6 summarizes the major advantages and disadvantages of experiments. Experiments also have the advantage of being a quantitative study (see Table 10.3 at the end of the previous chapter).

Table 11.5
SOLOMON FOUR-GROUP DESIGN

	Group I	Group II	Group III	Group IV
$Time_1$	$Observation_1$	$Observation_1$	No observation	No observation
$Time_2$	TV ad	No TV viewing	TV ad	No TV viewing
$Time_3$	$Observation_2$	$Observation_2$	$Observation_2$	$Observation_2$

FIELD EXPERIMENTS

Field experiments take place in the environment in which you naturally encounter the stimulus, such as running an ad during a broadcast television program or trying out a display in the grocery store. The example of the newspaper layout test above could also be done in the field at convenient locations where people actually read newspapers — coffee shops, commuter trains, etc. Rather than randomly assigning people to view a layout, you would randomly assign layouts to coffee shops (each layout in one-third of the shops). In other words, a field experiment is one that is conducted in the real world instead of a lab.

Test marketing is an attempt at a field experiment using populations with similar demographics, economies, etc. The market that gets the product or message is the treatment group, and a second market that is matched to the characteristics of the treatment market serves as the control.

The advent of electronic networks offers additional opportunities to conduct field experiments. "Switched-addressable" or digital cable television systems can be used. Each cable TV household has a separate electronic identifier/address, and some cable systems can carry different programming to different households. You could send one version of your ad embedded in a regular TV program to a randomly selected half the system and a second version to the other half. Then, by conducting interviews soon after the ads were sent, you can compare recall or brand awareness or purchase intent between the two ads. A true experiment.

The Internet offers other opportunities where you can test messages such as banners, pop-ups and other ads by randomly alternating between different versions and then comparing the click-throughs.

Table 11.6
ADVANTAGES AND DISADVANTAGES OF EXPERIMENTS

Advantages	Disadvantages
Test cause-and-effect	Complex
Control of environment	Expensive
Control of stimulus	Planning time required
Control of external variables	Requires more expertise than survey