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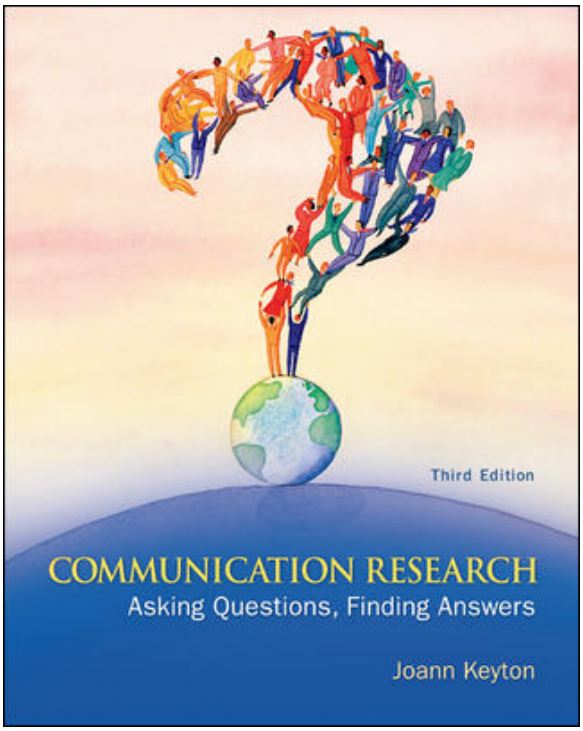

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Mc Graw Hill Higher Education

Communication Research

ASKING QUESTIONS, FINDING ANSWERS

THIRD EDITION

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The McGraw-Hill Companies

COMMUNICATION RESEARCH, THIRD EDITION

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PREFACE

This book began many years ago when I was forced to think about research methods in a new way. Approached by an organization to help them assess their human resources policy and training, I was overwhelmed by the task of identifying the problems and discovering and developing practical, yet theoretically based, solutions. I eagerly agreed to help the organization because their problem—how to create a workplace in which respect and dignity were core values—was an opportunity to test my skills and abilities as a communication researcher. I knew that I first needed to develop content expertise. After conducting library and database searches, I realized that the information I obtained was incomplete and at times conflicting. Yet, this information allowed me to develop an initial response that included policy, training, and evaluation procedures. I could have stopped there, presented the information to the organization, and considered myself done with the task. Yet, conducting research within the organization was a unique research opportunity, allowing me to both contribute to the organizational communication literature base and create a more tailored response for the organization.

Moving further into this process, I conducted focus groups with employees at all levels to gain insight into their personal experiences in the organization. Policy and training would not be as effective if they did not address the needs of employees and management. Data from the focus groups revealed that employees identified a few managers whom they believed to be effective in dealing with employee issues. I conducted field interviews with these individuals. Data from those interviews revealed that inconsistencies among the organization's current policies, training, and evaluation procedures were a significant problem. Next, I conducted a content analysis of the organization's policies to examine how the organization defined and formalized the relationship between managers and employees.

Again, I could have stopped there, presented the information to the organization, and considered myself done with the task. But a new research opportunity presented itself—to test employee and management acceptance of the policy and training I proposed. After designing and conducting survey and experimental studies, I was able to tailor the messages the organization wanted to send in a way that was acceptable to and understandable by employees.

The point to this story is that research is a process. In some cases, library research from the vast store of communication literature may answer our research questions. In other cases, researchers must design studies to collect quantitative or qualitative data that, when analyzed, will answer those questions. Too many times, I hear students describe research as having little relevance to their lives. But, when the research process is designed to answer questions about communication issues that are important to students, it provides them with a new perspective. Rather than considering research a laborious chore, they recognize that research is the most effective means for answering meaningful questions in their lives. As importantly, many employers seek research skills in hiring and promoting employees

The other point to my story is that far too often, I hear students and professors make claims such as, "I'm a quantitative researcher" or "I'm an ethnographer." In reality, researchers must have a broad understanding and appreciation of all methodologies—quantitative and qualitative—to conduct their research effectively. The third edition of this book continues to emphasize three important points:

1. All research starts with an initial research question or problem.

2. Research is a process in which the researcher makes important decisions at crucial points about what to do and how to do it. This is in contrast to viewing research simply as a series of steps to be completed.
3. To answer the varied nature of questions about communication, one must be familiar with both quantitative and qualitative methodologies.

Communication Research: Asking Questions, Finding Answers covers basic research issues and processes for both quantitative and qualitative approaches appropriate for communication students with no previous research methods experience. The text's guiding principle is that methodological choices are made from one's research questions or hypotheses. This avoids the pitfall in which students learn one methodology or one methodological skill and then force that method to answer all types of questions.

FEATURES

The primary purpose of this textbook is to introduce students to communication research methods by meeting two objectives. The first objective is to help students become better consumers of the communication research literature by emphasizing effective methods for finding, consuming, and analyzing communication research. This objective is important because students are consumers of the communication literature through their participation in communication courses. The second objective is to provide a path for students who wish to develop and conduct research projects. To those ends, this book provides coverage of the entire research process: how one conceptualizes a research idea, turns it into an interesting and researchable question, selects a methodology, conducts the study, and writes up the study's findings. I believe that students who can effectively navigate, select, and use the communication research literature can become effective researchers, and, reciprocally, that students engaged in communication research will be able to more effectively use the existing research literature. Regardless of the role in which students use their research knowledge, they must be able to read and understand the communication research literature.

This book provides several features to help students succeed in both roles. First, hundreds of examples are drawn from published communication research to provide clear direction on *what this process or step looks like.* These examples, 197 of which are new to the third edition, are drawn from recent journal articles, which are available in the Communication and Mass Media Complete database, or available online through university and college library subscriptions. Using examples from the breadth of the discipline (for example, persuasion, interpersonal, group, organizational, mass communication, and public relations) lessens the ambiguity between information presented in the book and students' understanding and potential application of the information.

Second, the book incorporates two kinds of boxes, placed throughout the chapters that alert students to the nuances of the research process. The first, *Design Check,* alerts students to the practical and logistical issues that student researchers should consider when designing a study. These are the same issues that students should ask of the research studies they read, as how these issues are addressed by researchers influences study outcomes and data interpretations. The second type of box, *An Ethical Issue,* alerts students to issues of research ethics and integrity. Not only must researchers balance practical and logistical issues, they must do so while addressing ethical issues that occur when *people* and their communication artifacts are used as the basis of research.

Third, the book is based on active pedagogy and the philosophy that students learn best by doing. *Chapter Checklists* begin each chapter to highlight for students the essential learning objectives for each chapter. The objectives help students make discrete distinctions about the research process and give students a standard for what they should be able to demonstrate after reading and studying chapter material. *Try this!* boxes are placed throughout the chapters

to engage students in short research activities that can be used in the classroom with individuals or groups, or as short homework assignments. End-of-chapter summaries have been developed as point-by-point summaries of information presented in the chapter. Stated simply, these factual statements can help direct students' study of the material and be used as a stimulus to extract students' understanding and application of the material. Key terms are boldfaced within the text and listed at the end of chapter. Key term definitions can be found in the glossary at the end of the book.

Finally, the book focuses on students. It is written for them—to their level of knowledge and understanding about human communication, the communication research literature, and the relative research processes. My goal in writing the chapters was to explain the research steps and identify the steps researchers take in developing and conducting communication research. With study and instruction, students should be able to use this material and integrate it with what they know and are familiar with from their other communication courses to accomplish two objectives: 1) to be more analytical and make more sophisticated interpretations of the communication research they read, and 2) to design and conduct basic quantitative and qualitative research studies.

WHAT'S NEW TO THE THIRD EDITION AND ORGANIZATION OF THE TEXT

The book presents a balance of quantitative and qualitative research because the communication research literature embraces both approaches. In addition to the updating of published research examples, the biggest change to the third edition is the increased focus on qualitative research. More examples are given, more direction is provided in how to design a qualitative study (Chapter 14), and collect (Chapter 15) and analyze qualitative data (Chapter 16), as well as writing a qualitative research report (Chapter 18). Information in each of these chapters was strengthened with greater depth and more examples; and, this information was reorganized for improved flow that better mirrors the qualitative research process.

The book remains divided into four sections. In the first section, Research Basics, students are introduced to the research process, its basic principles, both quantitative and qualitative research, and research ethics before specific methodological techniques are addressed. This organization emphasizes that research is a process, not just one type of method or research skill. Chapters 1 and 2 are introductory to research in general and are neutral with respect to methodology. The issues raised in these initial chapters are issues that both quantitative and qualitative researchers must address. Specifically, in Chapter 1, the discussion of communication research has been enhanced to make clearer distinctions among the differences and similarities among social science, rhetorical, and critical research traditions. Additional information has been included to show that communication research conducted under different perspectives influences what counts as data and how communication is explained. Chapter 2 was updated to reflect recent changes in web and online resources with which students should be familiar.

Then Chapters 3 and 4 provide introductions to both quantitative and qualitative methodologies. This arrangement encourages students to consider both methodologies and to gain a foundation in each before proceeding to detailed information in subsequent chapters on how specific methods within each work. Chapter 3 was revised in two ways. First, a clearer explanation of the relationship between independent and dependent variables was added. Second, the information on intervening and confounding variables was removed. Both of these changes are intended to make the central ideas of quantitative research easier for students. Chapter 4 was revised to emphasis the centrality and importance of the iterative process to qualitative research.

Chapter 5 is devoted to issues of research ethics—issues students must consider regardless of which methodology they choose. Information in this chapter was checked with, and if necessary updated to, current professional standards and federal government regulations and standards.

A *Design Check* box on research on the Internet was added to reflect researchers' increasing use of this data collection technique and the issues it raises. With the increasing use of technology, the issue of what's private and what's public has changed. Thus, the distinction between private and public is now conceptualized as a continuum rather than a dichotomy.

The second section of the book, Quantitative Communication Research, provides detailed coverage on how research is conducted with quantitative methodologies. Chapters 6 through 9 explain measurement concepts, sampling procedures, and experimental, quasi-experimental, descriptive, and survey research designs. Chapters 8 and 9 have been changed the most. Chapter 8 includes additional coverage of the advantages and limitations of quasi-experiments, as this form of experimentation is prevalent in communication research. Still, the chapter begins with description of the classic experiment, as that is the theoretical model for other experimental designs. More attention to independent and dependent variables has been added earlier in the chapter. Chapter 9 on surveys and questionnaires has a new section that provides recommendation for online survey data collection. Enhanced information on survey layout has also been included.

On the advice of reviewers, all material on significance levels and hypothesis testing has been moved to Chapter 10 and its treatment of descriptive statistics. A section on structural equation modeling was added to Chapter 12, to mirror the increased use of this statistical test in communication research. A figure was also added to help students distinguish between types of tests of relationships presented in this chapter. As in the second edition, each of the statistical chapters emphasizes interpreting the results of these tests. Chapter 13 explores two quantitative methods for analyzing text and message content.

Changes to the chapters in the third section, Qualitative Communication Research, are noted above: In essence, more information, more recommendations, more research examples were added, especially to the chapters on data collection and data analysis.

The fourth section of the book, Reading and Writing Research Reports, provides separate chapters for concluding the research process. These chapters demystify this stage of the research process for students, whether they are reading the research literature or ready to write a research report. Researchers relying on tradition and customary practices are able and adept consumers of the research literature. Alternatively, students confront the research literature with little understanding of how and why finished research reports look the way they do. By having access to this *insider* information, students will be able to prepare their final projects in the traditions of the discipline as well as be able to better decode the research literature.

Across all of the chapters, I worked to be more inclusive of examples drawn from intercultural research, research by international scholars, and research about technology or that used technology in data collection. With the shift from APA 5th to 6th, I chose to create all of the citations and references in APA 6th style, and have made special note of this where appropriate. Finally, a note about online resources available to students was added to each chapter. Whether you assign students to work with these resources inside or outside of class, or expect students to use these materials on their own, the online resources provide students with ways to enhance and test their knowledge of research methods.

In talking with colleagues who also teach research methods, I have found that instructors differ greatly in their treatment of statistical concepts. To accommodate these differences in pedagogical style, this book presents the conceptual foundation of each test supported with examples of the test from the research literature. Each test is discussed from the point of view of a student who finds this test in the literature. Questions used to develop these chapters include: How should I read the results of any particular test? How do I connect these results to the research questions and hypotheses the authors proposed? Alternatively, for those students who want to design and conduct quantitative research projects, the statistical formulas (with worked examples as models for each test) appear in an appendix; a sample dataset

and instructions for SAS and PASW (or SPSS) software appear online.

TEACHING SUPPLEMENTS

Detailed instructor's materials are available at the Instructor Center website accompanies the book (www.mhhe.com/keyton3). The password-protected instructor's center includes sample syllabi, teaching tips, chapter and course assignments, exercises and PowerPoint outlines for each chapter, a test bank, and worksheets for each chapter. Typically one or two pages in length, worksheets can be used as a homework or in-class assignment for students to review their knowledge and understanding about the material presented. Question types include objective (for example, fill in the blank), comprehension (for example, explain how academic research differs from proprietary research), and behavioral (for example, given a set of variables the student is asked to write research questions and hypotheses). For those chapters that cover statistics or the analysis and interpretation of qualitative data, additional worksheets are available, which provide students with the opportunity to work several examples from raw data through to interpretation.

The Student Center can also be found at the same website (www.mhhe.com/keyton3). This site is not password-protected and includes PowerPoint outlines for each chapter; URLs for websites that support or provide additional material presented in the chapters; online review tests; and a glossary. Sample datasets and instructions for using SAS and PASW (or SPSS) for the descriptive and inferential statistics presented in Chapters 10, 11, and 12 are also included here.

ACKNOWLEDGMENTS

In writing this book, I have benefited from the generosity of researchers, scientists, and scholars from many disciplines around the world. Unlike many other bodies of knowledge, the Web has become a cornucopia of information about research methods and statistics. When contacted by e-mail, these colleagues were both prompt and generous.

I have also benefited from the many undergraduate students in my research methods course who continued to say that they did not understand after I had explained a concept or technique. Their questioning and my inability to always provide them an appropriate and acceptable answer provided the motivation for this text.

This third edition has benefited from the many instructors and students who have e-mailed me with questions or issues they would like me to address or explain further. I appreciate this feedback-in-progress and much of it has been incorporated here.

I also thank the scholars who reviewed this text during its development for the encouragement and wisdom they extended. Reviewers for the third edition were: Tammy Swenson Lepper, Winona State University; Mark Comadena, Illinois State University; Nancy Curtin-Alwardt, Millikin University; Jong Kang, Illinois State University; Paaige Turner, Saint Louis University; Deden Rukmaan, Savannah State University; Darin Garard, Santa Barbara City College; Robert Brown, Salem State College; Steven Venette, University of Southern Mississippi; Bo Feng, University of California, Davis; Rita Rahoi-Gilchrest, Winona State University; Lindsey Chamberlain, Ohio State University; Suzanne Piotrowski, Rutgers University, Newark; Xin Ren, California State University, Sacramento.

Thanks to the McGraw-Hill team, led by executive editor Katie Stevens. Others on this team included Craig Leonard, developmental editor; Meghan Campbell, managing editor; Erin Melloy, project manager; and Pam Cooper, marketing manager. They helped me produce the finished product.

In the first edition, I thanked my colleagues—Tommy Darwin, Steve Rhodes, and Pradeep Sopory. In the second edition, I added Ron Warren, Debbie Ford, and Tracy Russo. Each of these six people have enriched and challenged my role as researcher. For this third edition, I'd like to thank Paul Schrodt, Ryan Bisel, Stephenson Beck, and Renee Meyers for always returning the e-mails in which I proposed a

methods question or conundrum. The book has benefited from those online discussions.

I would also like to thank the many undergraduate and graduate students who have worked with me at North Carolina State University, University of Kansas, and University of Memphis on research projects and who have worked through research issues (and challenged me) in methodology classes. For me, methodology is the best teaching assignment I can have.

Thank you to my friends—Bob, Randy, Christie, Sherry, Joanne and Tom, Pat and Jay, Linda, Liz and Kim, Allison, Amy, Stephanie, Kelby, Dave, Christi and Allen, and Bill. I appreciate your friendship and support. Again, fs, thanks for your special friendship. The completion of this revision is another reason to enjoy two of the finer things in life.

This revision came at a difficult time. Sally had passed during my beginning work on this edition. Sonny and Cher are making sure that I live up to my promise that I will not forget what my *real* job is: to let the dogs in, let the dogs out, let the dogs in, let the dogs out. . . .

Jeff—this book is for you. As a student, you would not allow me to let you down. As a friend, you have not let me down. Your invaluable lessons, both professional and personal, helped me write this text in the beginning and through its two revisions. Thanks for your continual support and encouragement. My love always.

Letter to Students

Welcome to communication research methods. The principles, traditions, and norms presented in this text are simply that: principles, traditions, and norms. This means that these characteristic ways of conducting and writing about research and evaluating research are not fixed. Although enduring, these principles, traditions, and norms can and are being changed.

New statistical procedures are being developed (or older statistical procedures are being reintroduced) by researchers to help deal with the complexity of and connections among communication concepts. Researchers are exploring alternative ways for presenting qualitative data. When a researcher uses a method or technique of collecting, analyzing, or presenting data that is unique or different, the writer should provide arguments for its use and its validity or credibility. I think that's fair.

As you explore research methods, I recommend that you first take on the role of being a consumer of scholarly research. Undoubtedly, your instructors have asked (and will continue to ask) you to read articles and book chapters of scholarly research that present data about communication phenomena. With an understanding of research methods, the data and authors' interpretations will be more meaningful. As importantly, you will begin to appreciate how you can use research methods skills in your workplace and the community.

I also encourage you to resist the urge to label researchers or yourself as quantitative researchers *or* qualitative researchers. *Communication is such a diverse and complex phenomenon that both quantitative and qualitative methods are needed for its exploration. Without a doubt, many researchers favor quantitative over qualitative, or qualitative over quantitative; it's likely they have developed strengths in one area. And that's okay! Even if you choose to favor one type of research method over another, you'll need to have enough skills to read a variety of research reports.*

Miller (2000) reminds us: Our goal as communication researchers should be to pursue important questions about communication rather than categorizing ourselves as a certain type of researcher. It is only possible to learn from the breadth and depth of communication research if we can read and understand it.

Learning research methods is much like learning another language and culture. It's not likely that you will become proficient in Spanish, for example, at the end of one course. Likewise, to be proficient you need to immerse yourself in reading about and the doing of research methods. The authors of articles in scholarly books and chapters have had more than one course in research methods. It's a journey, not a location. Even if you do not take another course in research methods, you are learning about research methods as you read articles and book chapters and as you question "why did they do that?" and "how did they get to that conclusion?"

I hope this text helps in your journey.

Best,

Joann

Miller, K. I. (2000). Common ground from the post-positivist perspective: From "straw person" argument to collaborative coexistence. In S. R. Corman & M. S. Poole (Eds.), *Perspectives on organizational communication: Finding common ground* (pp. 46–67). New York: Guilford Press.

CHAPTER ONE

Introduction to Communication Research

Chapter Checklist

After reading this chapter, you should be able to:

1. Identify instances in which you could use or conduct communication research as a student, use or conduct communication research as a professional, and use the results of communication research in your personal life.
2. Explain the goals of research.
3. Explain the relationship of research and theory.
4. Explain communication research as a social science.
5. Describe how communication research from a social science perspective is different from other forms of communication research and other forms of social science research.
6. Differentiate among the characteristics of science.
7. Distinguish between research question and hypothesis.
8. Describe the differences among questions of fact, variable relations, value, and policy.
9. Identify questions about communication that you believe are worth pursuing.

As a student in a research methods course, you have two roles. In one role, you are a consumer of communication research. You read summaries of research in your textbooks. In some courses, your instructors may require you to read and analyze research articles published in the discipline's journals.

In the other role, you are a researcher collecting and interpreting data to answer research questions and hypotheses. These activities may be part of the course for which you are reading this book, an independent study, an upper-division course, or your senior project. The information in this book can help you succeed in both roles. But before you identify yourself with either or both roles, turn your attention to answering the question "What is research?"

WHAT IS RESEARCH?

In its most basic form, *research* is the process of asking questions and finding answers. You have likely conducted research of your own, even if it wasn't in the formal sense. For example, as you chose which college or university to attend, you asked questions of students, faculty, and staff at the various institutions you were considering. You might also have looked on web pages for the different colleges and universities for answers to your questions or used the survey results from *U.S. News & World Report,* which ranks America's colleges and universities. As you made choices about your major, you read the college bulletin, talked to students and an advisor, and perhaps even talked to professionals in the field you believed you wanted to pursue. In these activities, you sought answers to your questions. Which school is best for me? Which school has the type of student experience I am looking for? Which schools are affordable? What is the annual income of alumni with my major? What kinds of career opportunities can I expect? By asking these questions, you were taking on the role of detective as you tracked down the information needed to make a decision.

Not only were you asking questions and seeking answers, but more than likely you were relying on the results of research performed by others, on the detective work of others. It would be impossible for you to answer your set of questions without such input. For example, for the question "What is the annual income of alumni with my major?" it would not be realistic for you to survey graduates in your major field to discover their annual income. More likely you relied on a survey conducted by a professional association, an alumni association, or a fraternity or sorority. You used the reported results of their work to answer your question. Although someone else was doing the research, you still needed to evaluate the efficacy of their research to gauge its usefulness in answering the question.

You are also familiar with other types of research. News reports profile the results of research each day. You have heard the results of medical research reported in the news. During political campaigns, the results of preference polls are reported in the news and archived on news organization websites. And, no doubt, you have heard the results of research on underage drinking and drug use. If you work, your company may have conducted research on the preferences of its customers or the quality of its products.

The point here is that research is all around us, often presented in ways that we would not recognize as research. Thus, **research,** as we will study it, is the discovery of answers to questions through the application of scientific and systematic procedures. Given this basic definition of research, you can see that you probably come into contact with several forms of research on a daily basis. You probably also use the results of research in making both personal and professional decisions.

The specific focus of this text is communication research—that is, quantitative or qualitative research conducted by communication scholars about communication phenomena. The focus is also on research conducted from a social science perspective, which is distinct from rhetorical research and also distinct from critical research. Yet, distinctions among these three perspectives—social science, rhetorical, and critical—are not always clear (Craig, 1993), and scholars working from the other perspectives

do use some methods more commonly associated with social science research. **Social science research** is conducted through the use of scientific and systematic methods, and it is based on the assumption that research can uncover patterns in the lives of people. When patterns of communication behavior are confirmed or discovered, scholars develop useful theories of communication that speak to the regularity of communication (Bostrom, 2003).

The research techniques and methods presented in this book are used to study the communication behavior of humans and the communication artifacts that people leave behind. Although some people think of social science research as objective research, communication scholars use both quantitative (more objective) and qualitative (more subjective) methods—sometimes separately and sometimes in combination with one another. Both types of methods are **empirical,** meaning that both methods are based on observations or experiences of communication. Both types are needed because it is unlikely that quantitative or qualitative methods alone can provide complete answers to the many questions we have about communication behavior.

Your Relationship with Research

As discussed earlier, your relationship to this material can be conceptualized in two ways—as that of a researcher or as that of a consumer of research. You may take on the researcher role as a student, as an employee, or as a consultant. It is likely that the class for which you are reading this book will develop and conduct a research project as part of a class assignment. You may also decide that the process of research is interesting enough that you plan to continue your education in graduate school, where you will receive additional instruction in research methodology. You might even decide to become a professor and spend much of your professional time as a researcher, finding answers to questions that interest you and matter to others.

After you graduate, you might find yourself in a professional position where research is part of your regularly assigned job responsibilities. Positions in marketing and advertising, as well as jobs in political, organizational, and legal communication, are just a few in which research plays a central role in decision making. Even though their organizational title may not be "researcher," many employees at the managerial or executive level are responsible for collecting and analyzing data to help organizations and employees make more effective and efficient decisions. But are these examples of communication research? They could be. Some organizations conduct surveys or focus groups to discover the degree of effectiveness of their internal communication practices. Media organizations regularly use surveys or focus groups to discover if informational, advertising, or promotional messages are being received as intended.

You could become a consultant and conduct **proprietary research,** research that is commissioned by an individual or organization for its own use. Organizations use consultants to evaluate their internal communication systems and operational effectiveness. Political figures also commission proprietary research to discover how they are doing in the polls and which of their central messages are having the most impact on potential voters. Marketing and advertising research is almost always proprietary. Even though the results of proprietary research are private and intended only for the use of whoever pays for the research, the researcher uses the same procedures and practices used in conducting scholarly or academic research.

Your relationship with research can also be conceptualized as that of a consumer. You consume the research of others when you read scholarly books and journals. You also consume research when you see or hear personally or professionally interesting information presented in the media, and use information about goods and services marketed to you. You might trust some sources more than others—or be more cautious—if you knew how the data were collected and analyzed.

Right now, your role as a consumer of research is more immediate than your current or potential role as a researcher. Your status as student forces you into the consumer role as you collect information in the library or from the World Wide Web to complete class assignments.

AN ETHICAL ISSUE

Is Communication Public or Private?

In general, what ethical issues do you believe are raised when researchers study the communication behavior of others? About what communication situations would you feel comfortable answering questions? In what situations would you feel comfortable having a researcher observe you? Should some communication contexts remain the private domain of participants, closed to researchers' inquiries? What about intimate communication between significant others in the privacy of their bedroom? What about the communication of parent to child when discipline is required? What about communication that occurs among co-workers as they discuss ways to ridicule their boss? How would you respond if a communication researcher asked you questions about your communication behavior during these events? What arguments could you develop both for and against communication scholars conducting research about such events? Should some communication behaviors or contexts be off limits to communication researchers?

Your ability to evaluate the information you collect has a direct impact on your ability to learn and prepare assignments. Moreover, the media bombard us daily with information that has been accumulated through research. In both instances, your relationship with research requires that you assume the role of detective. As a researcher, you are the primary detective seeking answers to questions, fitting pieces of the puzzle together, and interpreting what you find to make conclusions and recommendations. As a consumer, you must still be a detective sorting through the data others have provided. In this role you still need to distinguish good information from bad, test assumptions and conclusions drawn by others, and analyze the extent to which the research process others used fits your needs and situation. In this case, your job as a detective is to determine if the information you are using is misleading or misinterpreted from its original source.

It is easy to feel overwhelmed or intimidated by the particular vocabulary and traditions of research. But if you approach learning about research as a detective would approach finding information, you are likely to discover that formal research is an extension of the types of informal asking and answering of questions that you have done all your life. After reading this chapter, you should be able to identify how research acts as an influence on your life and in your decision making. Throughout the rest of this chapter and throughout the book as well, specific examples of communication research will be highlighted as we explore how research is conducted—that is, how research is planned and carried out and how data are collected, analyzed, and reported. The goals of the book are to provide you with the basic skills of a researcher and to enhance your ability to be a better critic of the research reported by others.

SCHOLARLY RESEARCH

With this introduction to research in general, we will turn our attention to the formal and systematic method of scholarly research. Researchers, or scientists, who have been trained in research methods and procedures (generally as graduate students) conduct research. These scholars formalize their questions into research questions or hypotheses, which provide the scope and direction of the research project as well as guide the researcher in selecting quantitative or qualitative methods to answer the questions. The questions or hypotheses direct what data the researcher collects. After the data are collected, the researcher or research team analyzes the

data to draw conclusions about the hypotheses or answer the research questions. Essentially, conducting research is a matter of making claims based upon data (O'Keefe, 2004). Different types of claims require different types of evidence, or data, which may be quantitative data, qualitative data, or both.

But the process is not complete. Scholarly, or academic, research is also public and available to consumers. However, the process of making it public is certainly different than it is for research conducted by a polling organization, for instance. Scholarly researchers describe what they have done in a paper that is submitted to a conference for presentation or to a journal or book for publication. Other experts in the field review the paper. This review serves as a test. Have the authors used the best methodology to answer their questions or hypotheses? Have the authors explained the results thoroughly and logically? Are there critical flaws in the research process that jeopardize the results? The papers that make it through the review process are then presented at a conference or published in an academic journal or book. This is where the results become consumable.

Pick up a text that is assigned reading for one of your other communication courses. You will find many references to research within the chapters. As an example, the following passage is from my text *Communication and Organizational Culture: A Key to Understanding Work Experiences* (Keyton, 2005):

> From any one position in the organization, it may look like the culture is consistently singular. However, it is more typical for organizations to structure themselves into networks based on tasks, relationships, information, and functions with organizational members identifying with, and belonging to, more than one network (Kuhn & Nelson, 2002).

The reference to the authors Kuhn and Nelson is called an in-text citation. If you turned to the references listed at the back of the text, you would find the publication information so you could look up the 2002 journal article written by Kuhn and Nelson. As the author of the text, I relied on the research of Kuhn and Nelson. As the reader of this passage, you are also a consumer and could verify my interpretation of their work by going to the original source.

Goals of Research

Accumulating knowledge through research is a continuous process. One research study cannot answer all the questions about any one issue or topic. This facet of learning—building on the research of others—is central to any academic discipline. Thus, the primary goal of communication research is to describe communication phenomena as well as discover and explain the relationships among them. Continuing with the example just given, discovery occurred when Kuhn and Nelson conducted research using both quantitative and qualitative methodologies to uncover how employees identified with their organization, and how those identifications resulted in communication networks. These scholars first built a case for their research question by drawing on the published research of other scholars. With the data they collected, they were able to describe employees' locations in their communication networks and their degree of organizational identification. Finally, they provided an explanation of the relationship between employees' organizational identification and their location in communication networks that followed logically from their arguments and the data. Thus, to put it more formally, research is the process of discovery and explanation.

The research process, if approached systematically, can have one of four results: It allows the researcher to describe behavior, determine causes of behavior, predict behavior, or explain behavior. *Describing behavior* entails describing outcomes, processes, or ways in which variables (another name for the concepts we study) are related to one another. The following example illustrates a research project that enabled a researcher to describe behavior.

Despite the number of contexts in which social support is given and received, detailed descriptions of the ways in which social support is enacted were missing. Using conversations from a peer-to-peer telephone counseling service, Pudlinski (2003) was able to develop

three categories to describe the ways in which social support is constructed. Across a dataset of 366 responses from 44 calls, he discovered three common patterns in the ways support providers displayed social support: summarizing or minimizing the caller's problem (e.g., "I see what you're saying"), providing or seeking solutions (e.g., "What kind of a job do you think you'll apply for?"), and supporting a caller's report (e.g., "That's good"). Pudlinski's detailed descriptions of social support suggest that these messages comprise greater variety and complexity than generally thought.

Determining the cause or causes of behavior is of interest to communication scholars because knowing the cause of something allows scholars to later plan interventions or develop training to increase the effectiveness of communication. Keyton, Ferguson, and Rhodes (2001) wanted to determine which variables had greater effect on employees' perceptions that their organization lived up to its stated zero tolerance sexual harassment policy. Would constructs in the interaction environment (e.g., respondent sex, being a target of sexual harassment, being treated fairly by co-workers and supervisors) influence how respondents characterized the sexual nature of the organization's environment and influence their perceptions of how well the organization lived up to its policy? Or would organizational remedies, such as receiving sexual harassment training and retaining knowledge from that training, be more influential? Using the responses of 252 employees, the research team tested the influence of the interaction environment factors against the set of organizational remedy factors. Contrary to the presumption of the organization's executives, organizational remedies were not related to employees' perceptions about the organization's zero tolerance sexual harassment policy. The study's findings did support, however, that factors in the interaction environment caused two different employee reactions. First, male employees, employees who had been victims of sexual harassment, and employees who believed they were not being fairly treated by their co-workers perceived the organization's environment as sexualized and that the organization did not live up to its stated policy. Second, and alternatively, employees who believed they were being fairly treated by their supervisors perceived that the organization's policy was being upheld.

If researchers can describe communication events and identify their causes, then they can turn to *predicting behavior.* If behaviors are predictable, then we can anticipate what will happen in the future. In turn, this knowledge can help us make better decisions. For example, Schneider, Lang, Shin, and Bradley (2004) wanted to determine if adding a story or narrative to justify game players' actions in violent video games would influence their game-playing experiences. This research team wondered if the addition of a story-based justification of killing to save the world would influence game players differently than the weaker narrative structure found in violent video games in which the story unfolds by moving to the next level of the game. Based on the research literature, the research team hypothesized that video game players would identify with characters and their goals to a greater extent when a story is present than when a story is not present. Experienced video game players participated in an experiment designed to test this prediction. Findings demonstrated that, yes, video game players more strongly identified with characters and their goals when a story was present. Thus, the research team's prediction was supported, suggesting that violent video games with stories justifying violent acts may desensitize game players to violent behavior.

Going beyond describing, determining causes, and predicting, *explaining behavior* means understanding why a behavior occurs. For example, if researchers were able to determine how and why health campaigns work, more effective campaigns would ultimately result in a healthier society that spends less money on health care. But finding such an explanation is difficult and often requires a series of sophisticated research projects. Working from a well-developed and validated theoretical basis is another way to develop explanations for communication behavior. For example, A. J. Roberto, Meyer, Boster, and H. L. Roberto (2003) surveyed 488 junior high students about four aggressive behaviors: watching a fight, telling friends about a fight that

is going to happen, insulting others, and fighting. For each of the aggressive behaviors except fighting, the explanatory model provided by the theory of reasoned action (i.e., the best determinant of actual behavior is behavioral intention) explained students' participation in aggressive behaviors. That is: students' attitudes about a behavior created behavioral intention, which, in turn, caused their participation in that behavior.

These four outcomes—description, determination of causes, prediction, and explanation—are closely related. New knowledge in one area will affect how questions are asked and answered in another.

Research and Theory

When researchers discover that one explanation about the relationship between phenomena occurs regularly, a theory can be constructed. Although many definitions exist for the term *theory,* in general, a **theory** is a related set of ideas that explains how or why something happens. In other words, a theory provides a way for thinking about and seeing the world (Deetz, 1992). More formally, a theory is a set of interrelated concepts, definitions, and propositions that presents a systematic view of phenomena. A theory specifies the relationships among the concepts with the objective of explaining and predicting the phenomena being studied (Kerlinger, 1986). As a result, theory helps us understand or make sense of the world around us. Of course, communication theories can help us understand our own communication behaviors as well as the communication behaviors of others (Miller & Nicholson, 1976).

With respect to communication, a theory is one or more propositions about people's communication behavior that enables a communicator to figure out how to communicate with particular individuals or in a given situation. The term *theory,* however, does not have one precise meaning. Rather, different definitions of the term are used because they promote different approaches to research (Craig, 1999; Miller & Nicholson, 1976). The best research is driven by theory, validates a theory, further explains a theory, challenges an existing theory, or aids in the creation of theory. Theoretically driven research is built on the results of previous researchers, and it provides a foundation for subsequent researchers. Theory cannot be formulated, tested, and verified in one research study. Rather, theory is developed and tested over time. What we come to know as *the theory* to explain some phenomenon is the result of many research studies and the efforts of many researchers.

Cushman (1998, p. 9) points out that "human communication is one of the most creative, flexible, and thus anti-theoretic processes in which human beings engage." Why? The complexity of communicating in multiple cultures with multiple, and sometimes conflicting, social goals provides the opportunity for multiple individual interpretations. Moreover, communication occurs in multiple languages with different sets of rules and practices. According to Cushman, this variability is one important reason communication scholars must look for the mechanisms or constructs that are constant regardless of the language used to communicate. Thus, communication researchers use systematic procedures and scientific principles to conduct research about how and why humans communicate as they do.

COMMUNICATION AS A SOCIAL SCIENCE

There are many methods of discovery and explanation, or many ways to view communication problems. Scholars conduct their research from paradigms that provide different explanations and functions for the role of symbols, messages, and meanings in the process of communication. These paradigms also create differences in what researchers count as data. You have probably explored these different paradigms in courses on communication and rhetorical theory.

Broadly, this book explores the social scientific study of communication for which a wide variety of methods is available. This text will introduce you to both **quantitative methods** (generally speaking, research that relies on numerical measurement) and **qualitative methods** (generally speaking, research in which the

researcher is the primary observer or data collector). Both methods are part of the social science research tradition as practiced in the communication discipline and reported in communication and related-discipline journals and scholarly books. Both quantitative and qualitative methods of research are empirical; that is, both methodologies are based on or are derived from experiences with observable phenomena. This is the critical element of research. Both quantitative and qualitative methodologies can observe and describe human communication. And both can help researchers in explaining or interpreting what was observed.

The study of communication from a social science perspective uses quantitative or qualitative methods to look for patterns of messages or communication behaviors. These patterns can be based on observations or measurements across the experiences of many individuals or on the in-depth observations from one case over time. Either way, the data must be empirical; that is, the data must be able to be verified through observations or experiences.

How does the study of communication as a social science differ from humanistic and critical studies of communication? The study of communication from a rhetorical perspective often focuses on how language is used to persuade in a particular case (for example, a specific speech by a specific person or other one-time event from which a text can be drawn or developed). In addition to the rhetorical event itself, an analysis would include the historical, cultural, and social contexts surrounding it. Probably the most useful distinction is that rhetoric is planned for a specific goal for a specific audience, whereas the social science study of communication focuses on the interactive moment between and among conversational participants. A rhetorical study is more focused on one case, whereas the social science study of communication looks for patterns across people or situations.

From a critical perspective, the research emphasis is on the hidden assumptions of broad social structures that serve the interests of some people (those in power) more than others. Critical communication scholarship focuses on understanding the domination, inequality, and oppression that can occur through communication practices and structures. (For example, what ideological structures in our society control or dominate the dissemination of new media technology?) Some critical scholars use qualitative methods in their research, and examples are included in this book. The definitional boundaries for what constitutes these three perspectives for studying communication (social science, rhetorical, critical) are blurry, and not mutually exclusive. Critical communication research can also be rhetorical. But, broadly speaking, this text focuses on the social scientific methods for conducting communication research.

How does the study of communication differ from the study of other social sciences? Generally, the social sciences are defined as those areas of scientific exploration that focus on the study of human behavior. Psychology, sociology, and political science are other fields in the social sciences. As a social scientist, the communication scholar focuses on symbols used to construct messages, messages, the effects of messages, and their meanings.

The social sciences are different from the natural sciences in that the social scientists focus on the study of human behavior. Problems that are significant for study in the social sciences involve several important variables, and untangling the effects of one variable from another is difficult. Moreover, the social sciences recognize that the researcher is a human instrument with biases and subjective interpretations that can affect the individuals or processes under investigation. Finally, seldom can an entire system of human behavior (for example, an entire organizational communication system) be observed. Even if it could be, human systems are always subject to new influences; thus, what is being observed is dynamic. As a result of these differences, the study of human behavior is difficult to isolate and control even if the examination is done in the laboratory setting.

One last point is that social science research is contextually and culturally bound. Research is contextualized first by the number and type of people participating and by the type of communication being investigated. Second, research is contextualized by where the investigation

occurs—in the lab or in the field. Third, research is contextualized by the culture in which it occurs. Researchers and participants bring cultural norms and values to what they do and how they communicate. All these contextual and cultural factors influence the research investigation, the data produced, and the interpretation of results.

The Scientific Approach

So how do communication researchers incorporate scientific characteristics into the process of conducting research? Generally, research follows procedural traditions that have been tested, validated, confirmed, and accepted by social scientists of many disciplines over time. The research process has five general steps (Kerlinger, 1986). Figure 1.1 illustrates this process.

First, researchers start with a question that interests them. A question may arise from their personal experiences or from experiences that have been reported to them by others. Or a question may arise from reading the scholarly or consumer literature. In other words, some question, or curiosity, is not explained or inadequately explained. A question may also be stated as a problem. In either form, the researcher cannot continue the research process without identifying and specifying the question or problem. For example, my own curiosity about why sexual harassment continues to occur in organizations despite clear societal and organizational signals that a perpetrator faces employment, legal, and even financial consequences for sexually harassing another employee caused me to pursue this area as a topic of research.

Second, the researcher uses the question or problem to formulate a **hypothesis,** or a tentative, educated guess or proposition about the relationship between two or more variables. Oftentimes, hypotheses take the form of statements such as, "If x occurs, then y will follow" or "As x increases, so will y." With respect to our sexual harassment research, we used previous scholarship to help direct our inquiry. One of our hypotheses proposed that participants who identified themselves as targets of sexual harassment would identify more verbal and nonverbal cues as harassment (Keyton & Rhodes, 1999).

If the researcher cannot formulate a tentative proposition after reviewing the existing literature, then a research question is developed. A **research question** asks what the tentative relationship among variables might be or asks about the state or nature of some communication phenomenon. For example, we used the research question "Will there be a relationship between ethical ideology and the ability to accurately distinguish between verbal and nonverbal behaviors that have been shown to be associated with flirting and sexual harassment?" (Keyton & Rhodes, 1997, p. 135). Although numerous studies had been published on both ethical ideology and sexual harassment, no study had explored the relationship between these two issues. Thus, we posed a question to help us determine if a relationship occurred. We could not propose what type of relationship would exist.

In the third step, which is often underemphasized, the researcher uses reason and experience to think through the hypotheses or research questions that are developed. A researcher might ask, "Do the research questions and hypotheses I've generated capture the essence of the problem?" or "Are there other variables that affect the relationship between the two variables I've identified?"

This step of reasoning, or thinking through, may, in fact, change the research agenda. It may broaden the nature and scope of research, or it may more narrowly focus the researcher's inquiry. By taking this step in refining and formulating the research question or hypothesis, researchers discover the most significant issue that can be addressed given their initial questions or problems. By using the experience we gained in developing sexual harassment training for organizations and by searching the literature, we discovered that one of our proposed hypotheses ("participants who identified themselves as targets of sexual harassment would identify more verbal and nonverbal cues as harassment") would not adequately explain why some employees view behaviors as sexual harassment and others do not. In other words, an employee's perceptions of sexual harassment would not simply turn on whether she or he had been sexually harassed. As a result, we tested three other explanations.

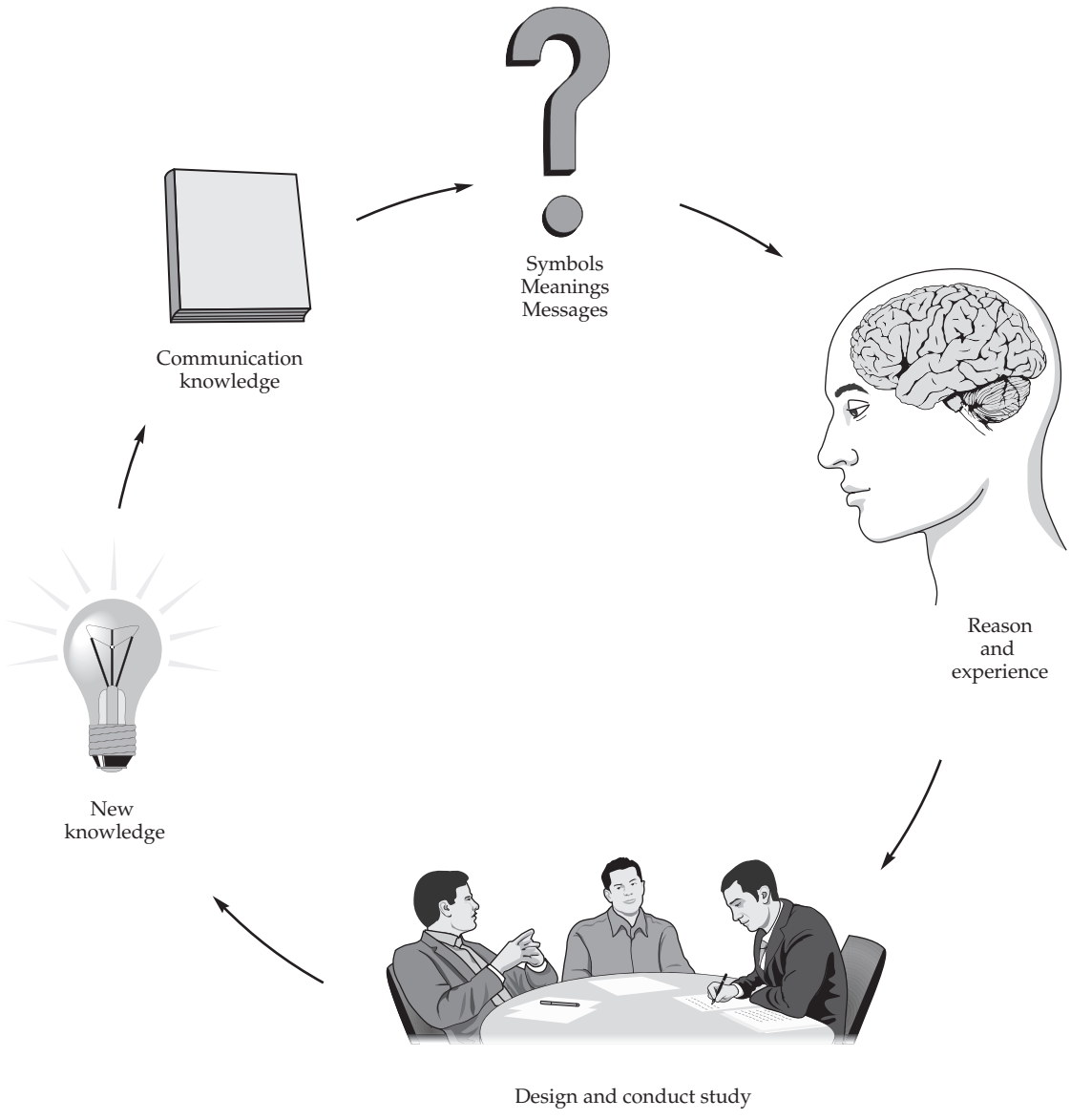

FIGURE 1.1 General Steps of the Scientific Approach.

Fourth, the researcher designs and conducts the observation, measurement, or experiment. Although each variable or element identified in the research question or hypothesis must be observed or measured, it is actually the relationship between them that is assessed. Fifth, the data are analyzed and interpreted in reference to the question or hypothesis posed in step 2 and refined in step 3.

Thus, the social scientific approach to communication research starts with a problem, a question, or an idea as the researcher identifies a

barrier or gap in knowledge. Then, the research question or hypothesis is formulated. Once developed, the research question or hypothesis is revisited and refined. Only then can the methodology be designed and carried out. The results are interpreted and fed back into our knowledge of the original problem. As a result, the problem is resolved, completely or partially, or new questions arise. Recognize that the five steps described are not necessarily discrete. One step blends into another. Work in one step may require the researcher to go back and revise what was previously completed.

Characteristics of Science

In pursuing these five steps of the research process, researchers can select from a variety of quantitative and qualitative methods. Although individual methods vary in the extent to which they encompass the following 12 characteristics, over time these characteristics have distinguished scholarly research from everyday, or informal, ways of knowing (Andersen, 1989; Bostrom, 2003; Katzer, Cook, & Crouch, 1978; Kerlinger, 1986). These characteristics are not unique to the study of communication. Rather, scientists of all disciplines have accepted them. Thus, the tradition of science rests with these 12 characteristics:

1. *Scientific research must be based on evidence.* Even experts can disagree. That is why evidence, or data, is paramount to the research process. Further, scientific research is based on the principle of empiricism. This means that careful and systematic observation must occur. What is observed and measured—the data—serves as the evidence researchers use in making their claims.

2. *Scientific research is testable.* This means that the proposition, research question, or hypothesis must be able to be probed or investigated with some quantitative or qualitative methodology. If the proposition cannot be tested or challenged in a research study, only speculations about the validity of the claim can be made.

3. *Researchers must explore all possible explanations in an effort to demonstrate that their proposition cannot be disproved.* If a proposition can be shown to be false, then, logically, it cannot be true, or valid. If the proposition and its explanation hold up over time, scientists come to accept the finding as true or real, until shown otherwise.

4. *The results of a research study are replicable, or repeatable.* Ideally, different researchers in different settings and with different participants should conduct replication studies—studies that repeat the same procedures. The results of any one study could be wrong for many reasons. Repeating the same or a very similar study many times and obtaining the same or very similar results ensures that the finding is real and can be counted on.

5. *For replication to occur, research must be part of the public record.* This is why communication scholars publish their work in academic journals and scholarly books. Scholars typically are not paid for these publications, but their work is supported through their universities and sometimes by government agencies and other funding organizations. As part of the public record, university and college libraries provide access to these journals and books so you can scrutinize what researchers did and how they did it. Scientific study is available to other researchers and the general public. It is not private, or proprietary, research conducted for the exclusive use of those who paid for the research to be done. Because scientific research is part of the public record, scholars build onto as well as challenge each other's work. All published research includes a section describing the methods by which the data were collected and interpreted. This allows others to evaluate the methods used for potential weaknesses and to replicate the study for further validation.

6. *Because scientific research is part of the public record, it is also self-correcting.* This characteristic means that the scholars who conducted the original study as well as the scholars who replicate or challenge studies are continually improving the methods by which they observe or measure the phenomenon of interest. Improving on the methods is one way to develop a greater understanding and more detailed explanations.

7. *Scientific research relies on measurement and observation.* Researchers can measure your communication apprehension, for example, by

asking you to fill out a questionnaire. Or they can observe your apprehension by counting the number of times you lose your place when you are speaking and have to refer to your notes. When something is not directly observable, researchers develop and rely upon other methods (such as questionnaires) to capture participants' attitudes, perceptions, and beliefs.

8. *Scientific research recognizes the possibility of error and attempts to control it.* When things are measured or observed, we expect that some error will occur. For example, errors occur when a researcher does not see the participant lose her place while speaking because his attention is distracted by loud music playing in another room or when a mistake is made in transferring data from the coding sheet to the spreadsheet. Errors can occur in many places in the research process. Quantitative research limits and accounts for error through the use of systematic procedures and statistics. Qualitative research accounts for error by providing detailed description to allow the reader to draw his or her own conclusions and interpretations. Most procedures have been standardized over time and across disciplines. Such formality in procedure acts as a form of control to help the researcher eliminate error, bias, and other explanations for the result found. Despite these control mechanisms, it is impossible to eliminate all bias and error in conducting research. Recognizing that bias and error can occur, researchers must take every precaution in helping to minimize it.

9. *Scientific objectivity requires the researcher to minimize personal bias and distortion.* Despite the passion for their topic and the time devoted to the project, researchers cannot be so committed to their own point of view and expectations that they fail to see other explanations when they appear. In essence, the objectivity of science distinguishes it from conclusions based solely on opinion. Too frequently, objectivity is associated only with quantitative research, and subjectivity is associated only with qualitative research. In reality, all researchers, regardless of method, must demonstrate objectivity in conducting research. Even though qualitative research is more subjective due to the greater intimacy of the researcher–participant relationship, scholars doing this type of research must be able to describe their role in the research process, and this act requires a certain amount of objectivity. Alternatively, statistics must be selected and statistical findings must be interpreted—both subjective decisions. The point here is not to quibble over the alignment of objectivity/subjectivity to quantitative/qualitative method. Rather, it is to introduce the concept of scientific objectivity as practiced by all researchers regardless of which methodology they choose.

10. *Science by its nature rests on an attitude of skepticism.* By their nature, researchers are suspicious; they do not rely on what appears to be obvious or on common sense. Within the social science research tradition, researchers rely on data compiled from quantitative and qualitative methodologies to answer their questions and support their claims. This element of skepticism is what allows, even encourages, researchers to put their assumptions through a process of testing or verification.

11. *Scientific research has an interest in the generalizability of findings, or the extension of the findings to similar situations or to similar people.* In quantitative research, findings are more externally valid if they apply to a range of cases, people, places, or times. In other words, are the results of studies that use traditional college-age students as research participants applicable to nontraditional college-age students? What about teenagers? Or retired adults? All studies have limitations, but by using discipline-accepted procedures, researchers can help strengthen the generalizability of their results. In qualitative research, findings are typically less generalizable because they are more case-specific. However, the generalizability of qualitative results can also be strengthened as a researcher spends greater lengths of time observing research participants.

12. *The final characteristic of science is its* **heuristic** *nature.* This means that research findings lead to more questions. At the conclusion of most journal articles, scholars identify new questions that surface from their findings. The ability of a

finding to suggest additional questions or new methods of conducting the research is its heuristic ability. The ultimate objective of science should be to lead scientists to future discoveries and investigations.

Methodological Extremes

This introductory chapter is a good place to also introduce you to a methodological extreme that you should be aware of as you learn about research methodology (Bouma & Atkinson, 1995). A child given a hammer for the first time is likely to run around the house and hammer anything and everything. From the child's viewpoint hammering is fun, even if hammering on Mother's new table is neither desirable nor appropriate (at least from the mother's point of view). The child hammers because it is new and novel.

Unfortunately, this same phenomenon can exist when students begin to learn research methods (see Cappella, 1977; Janesick, 1994). With each new technique, there is the tendency to believe that this particular method can answer any question. However, think of the method (or hammer) as a tool and recognize that there are appropriate tools for different purposes. To expand the tool metaphor, hammers are good for pounding in nails, but screwdrivers are better for twisting in screws. Saws are good for cutting things in two but are ineffective for affixing something with a nail or a screw! The point here is that the substantive content of the research question or hypothesis drives the selection of the methodological tool (Hackman, 1992; Janesick, 2000).

Methods are useful or effective only to the degree that they help the researcher answer a specific question or explore a specific hypothesis. In fact, the answers produced through any method of investigation are influenced by the specific methodological technique used in the investigation (Clark, 1990). So, if you let the method drive the research questions you ask or the hypotheses you test, then your results are more likely to be tied to the method you selected than to represent a valid response to the question or test of the hypothesis. No one research method can answer all questions. Although you will find that you are drawn to some methods more naturally than others, you will develop stronger analytical skills, both as a researcher and as a consumer of research, if you develop skills collecting and interpreting data from a variety of methodological techniques.

WHAT KINDS OF QUESTIONS DO COMMUNICATION SCHOLARS ASK?

Among the variety of questions that can be asked about communication are both important questions and trivial ones (Miller & Nicholson, 1976). How do researchers determine the significance of a question? There are three criteria: personal interest, social importance, and theoretical significance. "Any question that interests or perplexes a person is personally significant" (Miller & Nicholson, p. 49). Questions that interest me include (1) How do children learn to communicate in groups? (2) Why do some employees persist in sexually harassing other employees given the individual, relational, professional, financial, and legal consequences that are likely to result? (3) To what extent does the relational development among group members affect the task effectiveness of a group? Some of the studies my colleagues and I have conducted in these areas are used as examples in this book.

What questions interest you? They are probably related to your personal or professional life. Your interests may be idiosyncratic, not coinciding with the interests of others. This demonstrates why the second criterion of social importance is valuable and necessary. Because communication is a social activity, significant questions are those that have a general social import (Miller & Nicholson, 1976). For example, "What media campaigns would decrease the likelihood that children try drugs and alcohol?" or "What negotiation strategies work best in resolving international differences?" Finding the answers to questions like these could have a powerful impact on many lives. Questions that drive research do not have to relate to all members of society. But we should ask who would be affected by the answer. If enough people are

affected by or could use the answer to the question, then the question has social importance.

The third criterion is theoretical significance. Questions that further the construction of communication theories are significant (Miller & Nicholson, 1976) because they deepen our understanding and explanation of communication behavior. When these questions are posed and answered by research, we gain new knowledge.

Keeping these three criteria in mind can help us respond to the "So what?" question. Many times, people read research reports and have difficulty finding any significance or utility for the findings. If your research project is driven by personal interest, has societal significance, and helps further theory—and if these issues are described in the research report—then the "So what?" has been answered.

The Nature of the Questions

As you read the communication research literature, you will notice four types of questions (Stacks & Salwen, 2009). The first type, **questions of definition,** provides definitions for phenomena in which we are interested. Whereas you may believe that all definitional issues have been addressed, remember that new communication situations and environments and changing societal values create new areas to explore and define. As a question of definition, Olson and Golish (2002) asked what topics of conflict are associated with the use of aggression in romantic relationships. In this study, the researchers wanted to discover the topics aggressive couples argue about. Some individuals reported as few as one topic; others reported as many as seven topics of argument in their romantic relationships. Analysis of these incidents resulted in nine categories of argument. Another example of communication research that asks questions of fact is a study that examined how individuals used e-mail to communicate in romantic relationships at work (Hovick, Meyers, & Timmerman, 2003). Participants in the study responded to an online survey allowing the research team to answer how frequently partners in workplace romances used e-mail to communicate at work, and to what extent organizational policies and procedures shaped their use of that medium. The descriptions provided by both studies move the phenomena from the abstract realm into the specific. Without defining phenomena of interest, it would be impossible to ask other types of questions.

After the *what* has been adequately defined, researchers generally turn to questions of relationships. These **questions of variable relations** examine if, how, and the degree to which phenomena are related. For example, Metzger and Flanagin (2002) asked how age, education, sex, and Internet experience related to a relative instrumental orientation for using media. The researchers measured college students' instrumental (i.e., intentional, selective, goal-driven) and ritualized (i.e., habitual, passing time) use of four new media. To create the relative score, the mean scores for instrumental and ritualized technology use were compared. This score was then assessed to see if it differed according to student ages, education levels, sex, and Internet experience. By doing so, the researchers could describe the relationship between relative instrumental orientation and the four other variables. In this case, only age was related to relative instrumental orientation. Older users used new media more instrumentally than did younger users.

By understanding how variables are related, we have a greater understanding of our world and the role of communication behavior in it. Most important, questions of variable relations help the community of communication scholars build and develop theory.

Questions of value, the third type, ask for individuals' subjective evaluations of issues and phenomena. Questions of value examine the aesthetic or normative features of communication, asking, for example, how good, right, or appropriate a communication phenomenon or practice is. Questions of value are inherent in a study that explores how everyday discourse stigmatizes teenagers who are homeless. Harter, Berquist, Titsworth, Novak, and Brokaw (2005) interviewed homeless teens, educators, and social service providers. These teens, often called the hidden homeless, try to disguise the fact that they are homeless when talking with others to avoid

TRY THIS!

Evaluating Communication Questions

For each of the questions listed, evaluate your personal interest in the question and the question's social importance. Use the table to capture your evaluations. Rate your personal interest on a scale of 1 to 5, with 1 being "little or no personal interest" and 5 being "high personal interest." Rate social importance on a scale of 1 to 5, with 1 being "little or no social importance" and 5 being "high social importance."

Preliminary Research Question	*Personal Interest*	*Social Importance*
What is the prevalence and context of verbal aggression in televised professional wrestling? (From Tamborini, Chory, Lachlan, Westerman, & Skalski, 2008)		
Will news stories that are more deviant (i.e., the story is about an event that is unusual, breaks some norms, may lead to some kind of change in society) be more likely to be selected? (From Lee, 2008)		
Will fund-raising messages that contain information about fund-raising goals result in higher donations? (From Das, Kerkhof, & Kuiper, 2008)		
Will employees who are more centrally located in their friendship network at work be less likely to quit? (From Feeley, Hwang, & Barnett, 2008)		
What tactics do employees report using when expressing disagreement or contradictory opinions to their supervisors and managers? (From Kassing, 2009b)		
What coping strategies do people use when dealing with unfulfilled standards, or preexisting beliefs, about what makes a good dating relationship? (From Alexander, 2008)		

Compare your evaluations with those of other students. How are your evaluations similar or different? What other questions about communication do you believe merit researchers' attention?

being stigmatized or labeled. Other interviews revealed that community members are generally unaware of this homeless population and the difficulties the teens encounter trying to continue their education. This study raises the question of how this type of public discourse inhibits conversations that could bring awareness to the problem and help the teens and their families.

Questions of policy are the fourth type. Communication researchers seldom test policy issues directly, but the results of research studies are often used to recommend a course of action. Roberto, Carlyle, Zimmerman, Abner, Cupp, and Hansen (2008) tested a 7-week intervention program designed to prevent pregnancy, STDs, and HIV in adolescents. The intervention

included six computer-based activities. Over 300 10th graders at two high schools participated in the study. Students at one high school completed the intervention activities; students at the other high school did not and served as the control group. Students who participated in the intervention program outperformed students in the control group on disease knowledge, condom effectiveness, how to negotiate condom use, and attitudes toward waiting to have sex. The study demonstrated that modest computer-based interventions could be effective. Because this type of intervention can be used to reach a large number of teens, the findings have policy implications for agencies considering how to allocate funds for these types of health-related programs.

As you can see, communication research varies widely in its subject matter. Some research has implications for the development of communication theory, some has more practical application, and some contributes to both theory and practice. But all research starts with a basic question about communication that needs an answer, and all research uses some form of scientific and systematic research methodology in providing those answers.

SUMMARY

1. Research is asking questions and finding answers.
2. Scholarly research is the discovery of answers to questions through the application of scientific and systematic procedures.
3. Academic research follows accepted norms and procedures that have been adopted by scholars from many disciplines.
4. In the process of scientific discovery and explanation, four outcomes are sought: describing behavior, determining causes of behavior, predicting behavior, and explaining behavior.
5. The best research is that which is driven by theory, validates a theory, further explains a theory, challenges an existing theory, or aids in the creation of theory.
6. As a social science, communication researchers use both quantitative and qualitative methods.
7. The study of communication from a social science perspective looks for patterns across cases and focuses on symbols used to construct messages, messages, the effects of messages, and their meanings.
8. Communication scholars start with an interesting question and then formulate a formal research question or hypothesis.
9. Questions suitable for communication research are those for which the researcher has a personal interest, one that is of social importance, and one that has or can help develop theoretical significance.
10. A hypothesis is a tentative, educated guess or proposition about the relationship between two or more variables.
11. A formal research question asks what the tentative relationship among variables might be, or asks about the state or nature of some communication phenomenon.
12. Research is judged to be scientific by 12 characteristics: its empirical nature, its ability to be tested, the extent to which it can be falsified or disproved, the ability to replicate or repeat findings, the public nature of findings, its self-correcting nature, the ability to measure or observe the phenomenon of interest, the ability to minimize error through the control of procedures, its level of objectivity, the skepticism it raises, the generalizability of findings, and its heuristic nature.
13. Questions suitable for communication research may be questions of fact, questions of variable relations, questions of value, or questions of policy.

KEY TERMS

empirical
heuristic
hypothesis
proprietary research
qualitative methods
quantitative methods
questions of definition
questions of policy
questions of value
questions of variable relations
research
research question
social science research
theory

See the website www.mhhe.com/keyton3 that accompanies this chapter. The site contains a chapter summary, outline, and checklist. A PowerPoint presentation created by Dr. Keyton is also available for download as well as a short multiple-choice quiz to check your learning. You will also find a list of Internet resources that provide further information about the issues in this chapter.

CHAPTER TWO

The Research Process: Getting Started

Chapter Checklist

After reading this chapter, you should be able to:

1. Explain why the research process starts with identifying a research problem.
2. Develop a preliminary question from a topic or issue.
3. Explain why a preliminary question is superior to a topic in conducting library research.
4. Evaluate preliminary questions for their completeness and clarity.
5. Conduct a search for print and online resources.
6. Glean the basic ideas from reading the abstract, literature review, and discussion sections of a research article.
7. Track a citation back to its original source.
8. Effectively summarize and report what you have found in the library.
9. Describe what a theory is and its role in communication research.

Doing research means joining the conversation. Whether you are conducting a literature review for a class assignment or developing a literature review to support a research project you design and conduct, you will need to know what exists in the research literature. This chapter will help you identify ways of identifying research ideas and turning them into preliminary questions. After reading this chapter, you should be more comfortable and effective in conducting literature reviews and in determining what is a credible source. Much of what you will find in the library will be related to the theories researchers use to describe, predict, and explain communication behavior. This chapter will also describe what theory is and how it is developed through the research process.

THE RESEARCH PROCESS MODEL

In Chapter 1, I introduced the metaphor of researcher as detective. Like detectives, researchers are seeking answers to questions. There are two possibilities regarding the information they need. First, an answer may already exist, but that information is not known to the researcher. In this case, library research usually provides the answer. Second, an answer is neither known nor available. In this case, the researcher must develop and conduct research to uncover an answer. In either case, finding an answer depends on the researcher's detective skills, or the ability to search and track down information that fits his or her needs.

The model for conducting research is similar to the plan a detective would follow in conducting an investigation. There are rules to be followed and multiple paths that can be taken according to the questions asked. Once started, the research process or investigation proceeds logically and steadily. Working from what you already know and understand, your primary objective as detective or researcher is to find information that answers the questions. Yet, obstacles and pitfalls along the way may keep you from accomplishing your goal. You must be vigilant and pay attention throughout because your ability to respond to the changing environment presented to you is really the key issue and determines whether you are successful in answering your question. Just as detectives conduct their investigations within the letter of the law, researchers conduct their investigations according to the traditions of scholarly research.

If you were trying to explain how a detective conducts an investigation to someone who was unfamiliar with the process, you might, in general, say that detectives seek answers to unanswered questions, assess the situation presented to them, and then identify the procedures most likely to answer the questions presented by the situation. In the ideal situation, when the investigation was over, the questions would be answered. But detectives would not be able to explain in advance exactly how to find the answer to any one question because they would not be able to predict which clues they would uncover and which they would not. Certainly, an experienced detective has developed strategies that can help with the investigation. As a researcher, you can rely on scholarly standards, traditions, and norms to help you answer your question. Yet, in neither case would your strategies or predictions be certain.

Two models—or strategies—can provide a general explanation of what the research process is about, how one conducts research, and what one expects to be able to conclude at the end. Take a look at the first research model, presented in Figure 2.1, to see how the deductive research process is structured. Notice how the model is circular and cyclical. Each of the steps must occur for the research process to be complete. In this case, after identifying the research problem, the detective or researcher begins with a theory and then gathers evidence, or data, to assess whether the theory is correct. This type of research process is **deductive** because the researcher is moving from a known or assumed position supported by a theory to the particulars of the data.

After entering the research process where it begins—"Identify the research problem"—the researcher uses theory to guide the investigation. Next, based upon theory and research findings, the researcher formulates the research question

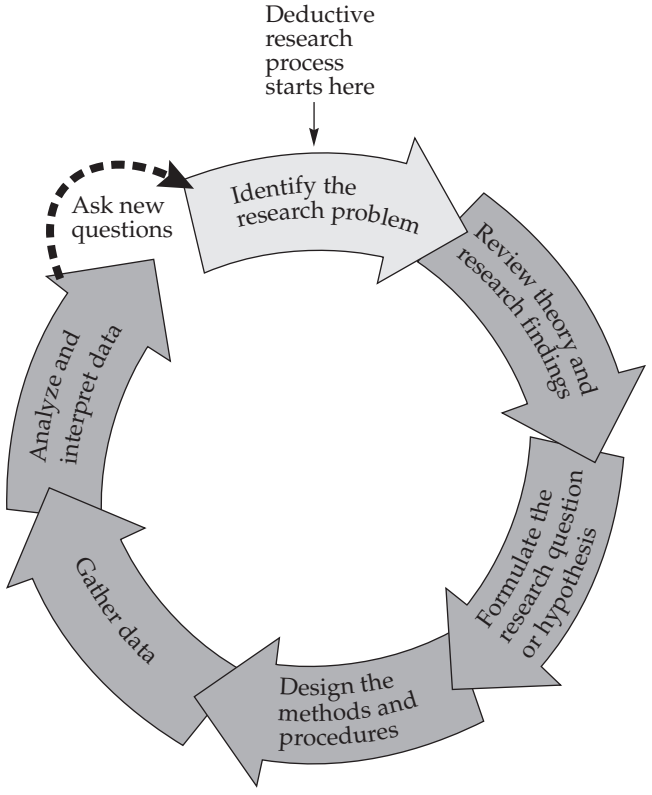

FIGURE 2.1 The Deductive Research Model

or hypothesis. Continuing on from there, the researcher then selects the research methods that will help in answering the questions or hypotheses. Then data are gathered and interpreted. Although the researcher will be able to answer the initial questions at this point, the research process is not necessarily complete.

Recall that research is prized for its heuristic characteristic. If research has heuristic significance and values building on the work of others, answering one question should lead to other questions for which answers are needed. Thus, as answers are developed from the interpretation of data, the research process starts over again with a new question.

Alternatively, a detective suspends judgment in beginning his or her detective work and develops a plan for gathering data that is framed around the foundation of a research question (Figure 2.2). After the data are gathered and examined, theories are developed in response to what the data reveal. This type of research process is **inductive** because the researcher is moving from the specifics of the data to the more general explanation of theory. Again, the research process is complete, but only temporarily. Reports of these findings are likely to encourage researchers to identify new research topics and start the process again.

Regardless of where one enters the research process, all of the steps are linked together. The steps are not independent activities but rather are interdependent. At times, researchers believe they have completed a step and proceed to the next—only to find that they do not have the most effective foundation from which to proceed.

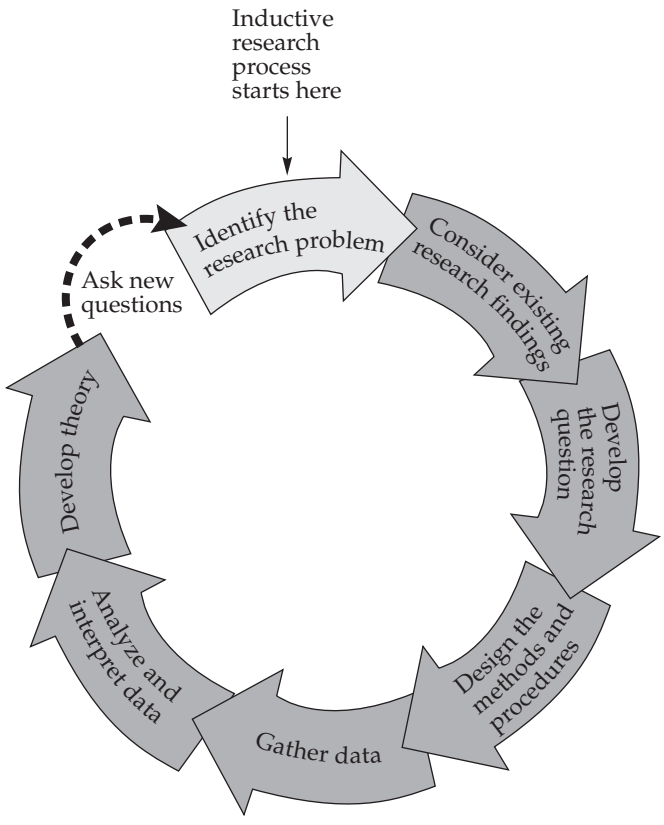

FIGURE 2.2 The Inductive Research Model

And so they must go back and work through the preceding step again. As you will discover in the class for which you are reading this book, research is not evaluated solely on its outcomes. Rather, the process that leads to the outcome, or research result, is equally important.

Whether a researcher uses the deductive or inductive process, the first research activity is to identify the research problem or topic. This process of identification is the focus of the next section of this chapter. Formulating the problem into a research question or hypothesis formalizes the research as social science. Research conducted according to the deductive model, which typically relies on quantitative methods, is described in greater detail in Chapter 3. Research conducted according to the inductive model, which typically relies on qualitative methods, is described in greater detail in Chapter 4. Throughout the research process, researchers must be concerned with issues of ethics and integrity. Communication research is conducted on, with, or through others. Thus, the communication researcher must seriously consider and evaluate the integrity of the research proposed. Moreover, the research must balance the scientific needs of the researchers (as well as society's need for knowledge) with the physical, psychological, and emotional needs of those who participate in the research. These issues are addressed in Chapter 5. But, for now, we need to discover how researchers identify the communication problem or topic of interest.

IDENTIFYING THE RESEARCH PROBLEM

Remember that research is the process of asking questions and finding answers. Just as a detective must examine the crime scene to get an idea of where to begin, you must identify a topic or an issue as a focus for the project and the questions that will follow. Identifying the research problem is always the first activity in the research process.

Formulating Research Ideas

If you cannot think of a topic or problem, let your daily experiences guide you. What happened today to you, or in front of you, that illuminated a communication dilemma, problem, or question? What are your family, friends, and colleagues talking about? How are their issues related to communication? Answering questions like these can help you think of a topic or problem. Often we tend to think that the daily problems of living we experience are unique to us. In reality, individual experiences may differ in some ways, but generally they are connected to and mirror the experiences of others. Thus, consider whatever problems you are facing as a good source for research ideas.

Still unsure about a topic or problem to pursue? A good way to survey contemporary problems and issues is to check what topics were on the front page of today's newspaper or presented on the radio or television. All the major news outlets—*The New York Times, USA Today,* ABC News, CBS News, NBC News, CNN, and others—have web pages that are updated throughout the day.

Turning Topics into Preliminary Questions

With the topic identified, you can begin to frame preliminary questions, which will help you search through library holdings and electronic databases. The preliminary question is not the final research question you will see in both the deductive and inductive models. The research question is more formal, and the foundation for the research project. The preliminary question is still important, however, because it can certainly lead you to the formal research question or research hypothesis. Before you seek library resources, use the following steps to evaluate your preliminary question. Taking this step will help make your library search more effective.

How does your topic lead to preliminary questions? Let's say you are interested in the impact of divorce on children's abilities to communicate their feelings. Closer examination shows that there are two topics here: The first is impact of divorce; the second is children's abilities to express their feelings. You could do library research on each topic separately, but doing so might not lead you to the answer. By formulating your interest in this topic into a preliminary question, "How does divorce affect children's abilities to communicate feelings?" you are more likely to seek resources that can answer your question or that will help you determine that the question has not been adequately answered.

But take another look at that question. What does the question assume? The question asks "how" divorce impacts children's abilities. A better first step would be to find out *if* divorce affects children's abilities to communicate. Thus, "Does divorce affect children's abilities to communicate feelings?" will be a better place to start, for it keeps you from falsely assuming that divorce does impact children in this way.

As another example, you might recognize that the team leader of your shift at work has difficulty in organizing and conducting meetings. You wonder if there is anything you can do as a team member to help. In this case, questions could be, "Are leaders the only team members responsible for how meetings are conducted?" or "In what ways can a team member maintain the role of team member and help the leader conduct more effective meetings?" or "What risks do team members take when they help facilitate meetings?" Now look at these questions for the assumptions embedded within them. In the first, you are asking about the basic assumption of who is responsible for conducting team meetings. But notice in the second and third questions that the answer to the first question is assumed.

Rephrasing the topic as a preliminary question is the first step in seeking answers.

Phrasing your question helps define your research area and narrow your search. Most important, questions help you uncover the links between concepts and help you identify assumptions you have made. And, as they frequently do, questions lead to more questions. If you end up with several questions, try to order them into a list of which questions must be addressed first, second, and so on. Or if questions in one area suggest questions in another area, try to draw a diagram of the relationship of the questions to one another. Regardless of how you identified your topic or problem, remember to formulate it into a question that focuses on communication. For example, a local news item on the prevalence of sexual harassment in your county government might end up as "In what ways does organizational culture promote or inhibit the occurrence of sexual harassment?"

Take a look at the examples of topics and problems in the Try This! box "Developing Initial Questions to Guide the Research Process." When you have finished revising a few of the examples listed, do the same to topics and problems that interest you.

TRY THIS!

Developing Initial Questions to Guide the Research Process

Read the example given in the table for the topic of instant messaging (IM). Notice how the general topic or problem is stated as a preliminary question. Then the question is analyzed for any underlying assumptions. For example, the sample question assumes that all people have access to the Internet, use instant messaging, and can explain why they use it. With these assumptions uncovered, the preliminary question should be restated so that it is more specific. Use the topics and problems listed in the following table to develop the preliminary questions to start the research process.

Topic or Problem	*State as Preliminary Question(s)*	*Examine Question(s) for Assumptions*	*Restate Preliminary Question(s)*
Instant messaging	How do people use IMs?	All people have access to the Internet. All people who use the Internet use IM. People will be able to explain why they use IM.	How do people explain their use of IM?
Parents talking with their children about guns and violence			
Careers for communication graduates			
Talking with superiors at work			

Evaluating Your Questions

After you have developed your preliminary question, it's time for evaluation. Use these questions to make a final assessment before you spend time searching the research literature:

1. Is the question clearly stated?
2. Do others agree about the clarity of the question?
3. Have you asked only one question? Not two, three, or four?
4. What is the communication orientation of the question? In other words, what communication practice, policy, rule, procedure, or consequence is being investigated? Is your focus on symbols, messages, or meanings?
5. Is the question phrased in such a way that it is not biased toward a particular answer or solution?
6. Is there some way to observe or measure the communication phenomenon of interest?
7. Can you research this question given the limitations of time and resources?
8. Who would be interested in the answer to the question?
9. How could those who are interested use the information?

If you are satisfied that you are asking the preliminary question in the most effective way and that the question is appropriate for communication research, you should identify the keywords or phrases to use in your search of library resources. Taking the preliminary question above, "In what ways does organizational culture promote or inhibit the occurrence of sexual harassment?", two keywords should be obvious: *sexual harassment* and *organizational culture.* What other keywords could also be useful? Sexual harassment is a form of *sexual discrimination* or *employment discrimination.* The phrase *organizational climate* is often used to address work issues. To clearly tie your search for sexual harassment and organizational culture to the study of communication, you should include the keywords *organizational communication* or *communication.*

USING LIBRARY AND DATABASE RESOURCES

With preliminary questions developed, you are now ready to conduct your search for resources. It is tempting to conduct all your research online, but working in the library has advantages as well. The most important advantage: You can ask a librarian for help.

If your library has the *International Encyclopedia of Communication* or the *Encyclopedia of Communication Theory* in print or online, these are good first steps in looking for resources for your preliminary question. The encyclopedic entries cover all aspects of communication. Each entry provides definitions, major themes of research, and several key citations. Regardless of where you gather resources, ask questions about the credibility, authority, relevance, and currency of the source. How something is presented (in print or online) does not necessarily make a source good or bad. If you select a source for your literature review or research project, you should feel confident that it is the best source for your project. It is also important to gather several resources so you can compare definitions and research findings. The next section describes several ways to find resources for a literature review or for a research project.

Scholarly Journals

Generally, your initial search should be for scholarly articles published in academic journals. Articles in journals give you the opportunity to see what research questions and hypotheses have been studied by communication scholars. You can read their arguments for the research study they designed, and read how they collected and analyzed their data. Most importantly, you can read about what they learned in conducting the study.

Journals are edited and published by scholarly professional associations, universities, or publishing houses dedicated to scholarly work. Scholars submit their manuscripts to a journal. The journal editor sends the manuscript out for review to at least two reviewers who do not know the identity of the author. This process allows reviewers

to give their honest and critical feedback about the manuscript. After this peer review, the editor makes a decision about revision and publication. Often, journal articles are published only after an extensive review and revision process. In addition, most journals have a very high rejection rate, generally 80–90%. As a result, journal articles are regarded as quality research written by knowledgeable experts. Some of the journals specific to the discipline of communication that publish social science research include

American Communication Journal
Communication Education
Communication Monographs
Communication Research
Communication Quarterly
Communication Reports
Communication Research
Communication Research Reports
The Communication Review
Communication Studies
Communication Theory
Electronic Journal of Communication
Health Communication
Howard Journal of Communications
Human Communication Research
International Journal of Listening
Journal of Applied Communication Research
Journal of Broadcasting & Electronic Media
Journal of Communication
Journal of Computer-Mediated Communication
Journal of Family Communication
Journal of Public Relations Research
Journal of Social and Personal Relationships
Journalism & Communication Monographs
Journalism & Mass Communication Quarterly
Mass Communication & Society
Political Communication
Public Relations Review
Qualitative Research Reports in Communication
Research on Language and Social Interaction
Southern Communication Journal
Western Journal of Communication
Women's Studies in Communication

Of course, there are other journals in the communication discipline as well as journals that are multidisciplinary (such as *Business Communication Quarterly, Critical Studies Critical Methodologies, Journal of Business Communication, Journal of Contemporary Ethnography, Journal of Health Communication, Management Communication Quarterly, Qualitative Inquiry, Small Group Research*). Finally, journals in other disciplines (for example, management, psychology, and sociology) do publish research of interest to communication scholars. In some cases, the research of communication scholars can be found there as well.

Journals can be accessed in a number of ways. First, your library subscribes to article databases that index communication research. *Communication & Mass Media Complete* (often shortened to CMMC) contains information on more than 600 journals in communication, mass media, and related fields. Many times, the full text of journal articles are available through that database. If an article you want is not in full text through this or another database, look directly for the journal. Your library subscribes to print and online issues of hundreds, maybe thousands, of journals. Most library websites have a *journal* link where you can search for a specific journal title. That link will indicate if your library has the journal in print or online, and what volumes (or years) it has.

Accessing journals through your library's website is recommended over performing a Google search for a journal. Why? Your library has purchased journal subscriptions. Thus, there is no cost to you for reading the online or print version. Check with your instructor or librarian to identify the journals that will satisfy your needs during your literature search.

Books

Your library also has a collection of books and edited books. Communication scholars often write or edit books about their research expertise. If you have identified an author who writes in the area you are conducting research, use his or her name in a search of the library catalog. Or use one of your keywords as part of a title or subject area search in the library catalog.

You should also check to see if your library carries *Communication Yearbook.* This annual series is an edited collection of literature reviews and topical critiques. For example, in Volume 32 (2008), *Communication Yearbook* published literature reviews on virtual teams and media literacy among others. You will have to check the table of contents of each *Yearbook.* If you find a chapter that helps you, be sure to review the resources in the reference section.

Finally, check to see if your library has a handbook related to your area of research. Handbooks are focused on one context of communication and provide extensive reviews and critiques of literature, theories, and methods in a particular area (examples are *Handbook of Family Communication, Handbook of Communication and Aging Research, Handbook of Political Communication Research, Handbook of Interpersonal Communication,* and *Handbook of New Media*). To find which handbooks your library carries, use the keywords *handbook* and *communication* to search your university's catalog database. If you find a chapter that helps you, be sure to review the resources in the reference section.

Online Resources

Because anyone can post a website and because so many websites are posted, finding information on the Web is not a problem. But finding credible, authoritative information can be. You will use a search engine (like Google) to search material available on the Web. Remember that all search engines are not the same; each search engine has a different mechanism for finding websites even when you use the same keywords for searches.

There is nothing wrong with doing resource searches on the Web. Online materials are not necessarily unreliable. If you look online, outside of the university library website, you will need to pay more attention to the credibility of the resources you find. Like the journals and books described previously, the first question to ask is: Is the online material written by a credible and authoritative source? This list of questions should help you make a decision about the author's credibility.

1. What type of domain does the site come from? Generally, .edu and .gov sites are considered more trustworthy than .org and .com sites.
2. Who publishes or owns the site? How can you tell? Look for this information between http:// and the next /.
3. Is this a personal website? One way to tell is to look for a tilde (~). Tildes often signify a personal website. If a tilde is used with an organizational name, often what follows is the website of a specific person of that organization.
4. Can you tell who (a person or institution) created the site? Is there a name, e-mail address, or a *about us* or *contact us* link? Where do those links take you?
5. Are the author's credentials or affiliations displayed on the website?
6. What is the purpose of the website? To inform? Persuade? Sell? Is advertising clearly labeled as such?
7. How current is the website? Look for dates to indicate when the site was created and updated.
8. If a source is quoted or paraphrased on the web page, is information about that source provided so you can independently verify the accuracy of the information?

Anyone can produce a website. This means that you must carefully assess what is presented. A website can present research that appears to be scholarly. But unless the site includes citations and identifies the author and his or her qualifications, it may be very difficult to gauge the authenticity or validity of the material.

Analyzing Your Resources

After you have found several articles, books, book chapters, or websites, you need to evaluate these sources. Read through the abstracts of each journal article or chapter you found, and then read the discussion section. Read the foreword or introduction and first chapter of each book. Check the list of references at the end of

the articles or chapters. Could any of the sources listed there be helpful to you? Are you able to answer your question? Should your question be revised based upon what you have found? At this point, you have reached another decision point. If you can answer your question to your satisfaction, your search is over. If you cannot satisfactorily answer your question, or if you found conflicting answers in your search, you can write your question in its final form. You are ready to develop your research project.

Answering the following questions can help determine if you have enough information or if you need to continue on with a detailed search. Your library search has been adequate if you are satisfied with your answers to the following questions:

1. How much has been written on your topic?
2. How recent or relevant is the material?
3. Has some critical event occurred or societal value changed that could challenge the interpretation of the answers to the questions asked?
4. Who has done the most work on your topic?
5. Where has research on the topic been published?
6. What aspects of the topic received the most attention?
7. What questions about the topic have been answered?
8. What aspects of the topic have been ignored?
9. Are there reasons to replicate, or repeat, studies that have been conclusive?
10. What other topics have you found related to your primary topic?

If you have searched thoroughly and diligently, you are likely to have uncovered the materials you need to answer your question or to develop your research project. Remember, however, that it is nearly impossible to find all the available literature. Finding everything is not a prerequisite for most student research projects. But you should have information available from a variety of authors, from a variety of publication outlets, and from sources published over time. Analyze your resources for their breadth and depth of coverage.

As you review the literature you have found, take good notes and copy or print all the relevant pages. Check out the table of contents as well as subject and author indexes of books. Identify books that are helpful by noting the authors' names, complete book title, year of publication, place of publication, publisher, and call number. Identify journal articles that are helpful by noting the authors' names, complete article title, year of publication, complete journal title, volume number, and page numbers of the journal article. You will need all this information to develop

TRY THIS!

Searching for Sources

1. Using the keywords *media* and *ethics,* perform a database search available through your university library. Do the same keyword search on Google. How would you describe and explain the differences?
2. Your question is "What nonverbal behaviors demonstrate confidence in public speaking?" What keywords would you use in your basic search? Conduct this search and report on your findings.
3. In your basic search for references on communication in stepfamilies, you have found that communication scholar Paul Schrodt is the author of several studies. How do you interpret this information? How would you use this information in your detailed search?

a reference list if you cite the material in your research project.

Adjusting the Question

As you work through the search strategies, don't hesitate to adjust your preliminary question. As you discover new information, you will develop a more sophisticated appreciation and understanding of the problem. Incorporate the information you read into your preliminary question. In particular, did your search uncover theories that can help you make sense of your question? Could several theories provide the basis for competing claims or solutions to your preliminary question? As you find new sources of information, it is likely that your preliminary question will become more narrowly focused. Keep a list of all resources that you are using. You will use these again as you develop your research project and as you write up your research report.

It is time to stop adjusting the preliminary research question when two conditions are satisfied. First, you should be comfortable that your question is specific enough to be interesting. Second, you should be comfortable with the quality

AN ETHICAL ISSUE

Using the Ideas of Others

A detective relies on information and clues provided by others. So does a good researcher. It would be impossible for one researcher to develop, document, and validate everything one needed to know about a subject or topic. In research, then, we must rely on the ideas and conclusions drawn by others. Anytime you use the work of others, you must provide a citation indicating in the text of your paper what idea you are using and whose idea it was. This is called an in-text citation. There are two types. The first is the citation for a direct quotation. In this case, you indicate with quotation marks the exact words you copied from the original work and provide the page number in addition to the author's last name and the year of the publication. This way, anyone who reads your paper can locate the exact source.

Reel and Thompson (2004) conducted a three-phase study to investigate interpersonal strategies of negotiating condom use. On page 102 of their article, they use the following direct quote in-text citation.

> In addition, Brown and Levinson (1987) tied the notion of face directly to "mention of taboo topics, including those that are inappropriate" (p. 670).

The second type of in-text citation is for situations in which you have summarized or paraphrased the ideas or conclusions of others. This in-text citation is documented with the author's last name and year of publication. An example of an indirect in-text citation from the same article on page 100 is

> Regarding condom negotiation, feelings of embarrassment are especially strong in men (Cline & McKenzie, 1994); in particular, men are especially likely to feel that suggesting condom use will diminish the chances of sexual intercourse (Bryan, Aiden, & West, 1999).

A complete list of your references is provided at the end of your paper. This enables the reader to locate the source of any in-text citation you used. Most social science researchers use the citation and reference style of the American Psychological Association (6th ed.), which is the style used in this book. Check with your instructor to see which style you should use.

DESIGN CHECK

Evaluating the Literature You Found

As you can see, the research process starts with your identification of a research topic and your search of the research literature. You will use the articles and chapters that you find in the literature review for your study. Communication research is indexed on several databases, so if you are not finding what you need, be sure to ask your reference librarian for help. As you search the literature, be sure that you are collecting studies that are published in communication journals or are authored by communication scholars. Scholars in many disciplines study communication, but the most complete and thoughtful focus on communication is published by communication scholars.

and quantity of resources you can use to help you answer your question. At this point, it is time to move on to analyzing the resources you have collected.

USING AND ORGANIZING YOUR RESOURCES

Getting started on a stack of resources is not easy. The first step is to read the title and abstract or summary of each resource. Next, read the problem statement, which is usually part of the literature review or precedes the literature review in a journal article or book chapter. It identifies the research objectives. Although the exact research questions or hypotheses may not be presented here, the problem statement generally suggests them. The problem statement answers the question "Why did the researchers conduct this study?" Generally, reading this section will help you decide if the article or research report will be helpful to you.

In the literature review, the authors present the literature that supports their formal research questions and hypotheses. Read the research questions and hypotheses carefully because the results or conclusions from the study are tied directly to them. For now, skim the methods and results section, and then move on to the discussion section. What did the scholars find? What were the answers to the research questions? Did they confirm or not confirm the hypotheses they proposed? Remember that the conclusion to the investigation is found in the discussion section. When a research question or hypothesis is presented in the literature review, it is still tentative.

Tracking Others' References

As you read the articles, books, and chapters, you will find in-text citations. This documentation device provides information within parentheses for the research work cited by the author. Each in-text citation includes the authors' last names, year of publication, and the page number if material is quoted word for word. To track down this citation, turn to the reference list at the end of the article, book, or chapter. This is labeled with the heading "References," "Bibliography," or "Works Cited." For each citation you will find a complete bibliographic entry—all the information necessary for you to find the article, book, or book chapter. Look at the "References" section at the end of this book for an example.

Why would you want to track down the articles, books, and book chapters that other authors have used? There are several reasons. First, these published works are part of an ongoing scholarly conversation. Something briefly mentioned in one article might lead you to another article that could provide valuable background information for you. Second, you may have missed this source in your library search. Tracking down the references used by others gives you the opportunity to fill in the gaps of your literature search. Third, authors

draw conclusions about the work of others and then base their arguments on those conclusions. If you are not familiar with the literature, you have to take the authors' conclusions for granted. Rather than relying on their evaluative biases, you could track down the reference, read it, and draw your own conclusions.

Organizing What You Have Found

Now, how will you organize the resources you have found so you can write a research report or a research proposal? First, look at the body of literature you have collected. Are there one or two authors whose names appear several times? If so, start your reading there. Researchers tend to work on lines, or streams, of research. This means that scholars become known for conducting research on certain topics. If the names of one or two scholars don't stand out, organize your literature by publication date. To get a historical overview, read from the older literature through to the newer literature. Another way to start is to begin with an article or chapter that reviews or summarizes a particular line of research. If you find conflicting ideas, theories, or findings, organize resources into similar categories.

Summarizing What You Have Found

One method is to arrange the material using major and minor points as primary and secondary headings, much like a traditional outline. A second method is to arrange the findings in chronological order, usually working from the oldest to the most recent. This is particularly helpful if you want to demonstrate how a question was answered or how a topic developed over time. A third method is to ask a series of questions and respond with what you found for each question. In this case, working from the broadest question to the narrowest question is recommended. A final method for organizing your material is to work from general to specific (a deductive approach), or build from the specific to the general (an inductive approach).

Whatever approach you take to summarizing what you found in your literature search, the primary question should be—"Have I answered my question?" If you have, you will need to think creatively about how to replicate, extend, or challenge those conclusions as the basis for a research project. Generally, there is little value in repeating the work of others if you agree with their conclusions and find no major faults in how they conducted the research. However, there is value in replication when the original study is dated, when societal values and practices surrounding the issue have changed or are changing, or when you find a flaw in the study that makes you question the results. For example, societal values about many adult relationships (such as marriage, living together, divorce, single parenting, adoption) have changed significantly. Research in these areas may be necessary to see if the conclusions drawn in the past about communication in these relationships are relevant now.

As you read and sort the literature you found, you might find that scholars disagree. Or you might find that research conclusions have been drawn about most, but not all, of the issues surrounding your topic. If scholars disagree, you could develop a research study to examine the disagreement. If some, but not all, issues are answered, you could develop and conduct the study that fills in this gap. Remember that one of the characteristics of science is that it is heuristic. This means that conclusions, or answers to questions, help identify new questions to be answered.

You now have the basis of the literature review section of your research report. The next step is to develop the formal research question or hypothesis and design your research study. Chapter 3 will give you more information for developing a quantitative study. Chapter 4 will do the same for developing a qualitative study. When you are ready, you can find information about writing literature reviews in Chapters 17 and 18.

CONSIDERING THEORY IN RESEARCH

Research revolves around theory. Thus, the journal articles and book chapters you find in the library use research as a basis for developing or challenging theory. *Theory* is a set of interrelated propositions that present a systematic view of

phenomena. The purpose of those propositions is to describe, predict, or explain the phenomena. For communication research, theory creates propositions about symbols, messages, and meanings.

Research is necessary to validate theory. Generally, quantitative research starts with a theory. Then researchers conduct a research study to demonstrate if a theory holds true for a set of data. If it does not, the theory is altered or discarded. In this theory–research link, theory is the map by which the researchers conduct their studies. As described earlier, this type of research relies on *deductive* thinking or reasoning in that theory presumes what will result and the research verifies those claims. Theory directs the researcher in developing hypotheses and questions and in selecting the method for testing them.

Research is also necessary to develop theory. Generally, qualitative researchers start with a research question and use their findings to both answer the question and contribute to theory development. In this theory–research link, the theory, or map, is drawn from the experiences uncovered by the research. This type of research relies on *inductive* thinking or reasoning in that theory, or generalization, is derived from the cases explored.

As you can see, research and theory are necessary complements to one another. Theorizing is important to research in two additional ways (Brooks, 1970). First, researchers cannot observe the entire universe. Rather, researchers must select a subset of phenomena to be observed. Theory directs researchers' attention to particular communication patterns, functions, themes, processes, and so on. For example, it would be impossible for a communication researcher to study every aspect of how communication is used in political campaigns. Thus, theory helps us define and isolate a communication phenomenon for study. Second, theory helps "integrate data which otherwise would remain mere collections of facts" (Brooks, p. 4). This issue returns us to the definition of theory given earlier. In a theory, research findings are integrated into a system of description, prediction, and perhaps explanation that help us answer questions of "What?" "Why?" "How?" and sometimes "What if?"

Developing Theory

We engage in informal theorizing when we try to make sense of the past, operate effectively in the present, or anticipate events in the future (Lustig, 1986). Although theorizing is a common and fundamental human activity practiced every day, formal theorizing as a scientific process is quite different. Formal theory building (Lustig) involves six basic steps:

In step 1, the researcher describes an event or observation that needs understanding. The event must be observable, interesting, important, and remarkable to come to the attention of the researcher or someone else who desires an understanding of it. This first step begins to identify the "what."

In step 2, the researcher creates an explanation for the event. Although anyone can create an explanation, it is the scientist's job to formalize and test explanations. In this step the answer to "Why?" begins to be formulated.

In step 3, the researcher moves from the specific event or observation to a more generalized form. In other words, if the event of interest is family decision making around the dinner table, the researcher could move to the more generalized communication event of decision making or the more generalized communication event of family interaction. The researcher must decide which type of communication event is more interesting and intriguing to investigate. By moving to a more abstract level, the researcher can now look for similar events to see if the answer to "Why?" developed in step 2 is also suitable for explaining these other, different but similar, events. Instead of focusing on one specific interaction event, the researcher must develop answers suitable for a class of similar events. This characteristic of theory moves it from an informal to a formal level. Although you are comfortable with the way informal theorizing describes and explains events that happen in your daily life, you would not be comfortable applying others' informal theories to the events that you experience. Thus, the researcher's job is to discover the commonalities among events that allow them to be classified and then to develop and test theories that describe and explain all events belonging to

TABLE 2.1 Theory Development—Steps 1 Through 4

	Task	*Example*
Step 1	Describe event or observation	Family members (2 adults, 2 children) eat dinner and discuss their daily activities. Father introduces family activity for weekend, which generates considerable discussion from children. Although the discussion initially has both positive and negative points introduced, eventually the children agree that they do not want to pursue the weekend activity suggested.
Step 2	Create explanation for event	Explanation 1: Children are likely to reject ideas presented by parents during dinnertime discussions. Explanation 2: Parents introduce ideas for family dinnertime discussion to obtain family members' preferences.
Step 3	Move from specific to more generalized form	General form 1: Children's rejection or acceptance of parental input. General form 2: Parents desire input from other family members.
Step 4	Derive predictions from explanations	Focus 1: Children are likely to reject ideas presented by parents. Focus 2: Parents will seek input about family matters from other family members.

a class. Thus, a theory of decision making should apply to many people's experiences of decision making, not just one's own.

In step 4, the researcher begins to derive predictions from the explanation developed in step 3. To do this, the researcher asks, "What else would be true, or observable, if the explanation was correct?" Continuing with our family decision-making example, the researcher could make several propositions that are testable. Examine Table 2.1 to see the progression from step 1 through step 4.

Now, in step 5, the researcher must select a focus and test the proposed theory. Most communication observations are complex enough to support multiple attempts at theory building. The researcher must develop a plan for and collect data that can test the predictions.

Step 6 of the theory-building process uses the obtained data to confirm, revise, expand, generalize, or abandon the proposition tested (Lustig, 1986). Notice that collecting the data in step 5 is distinct from interpreting the data in step 6. If the results are consistent with the proposition, the theoretical framework is confirmed for the time being. If the results are not consistent with the proposition, the discrepancy must be explained by critically examining the methodological process or by reworking the theoretical framework. If the theoretical framework is revised or if two alternative and competing explanations are present, the theory-building process starts again. If methodological problems are identified, the researcher repeats steps 5 and 6 using different and improved methodological procedures.

Even after these six steps, the theory-building process is not complete or final. Theory is developed over time, and this theory-building process is repeated many times as different scholars test theoretical propositions in their research. Both quantitative and qualitative research contribute to theory development.

Theories are developed and tested incrementally. After a basic theoretical notion is presented as a proposition in the scholarly literature, scholars develop studies to test the propositions. This is possible because the results of scholarly research are presented in a public forum. Theory is confirmed only after many studies, usually conducted by different scholars with different methodologies, achieve similar results. Even at that point, theories are still considered tentative.

TRY THIS!

Finding Theory in Journal Articles

Find two or three journal articles for a communication topic that interests you. Carefully read the literature review of each article. Does the author identify by name the theory or theories that are providing the foundation for the research study? Does the author point to a description, cause, prediction, or explanation as the reason for conducting the research? If so, this is likely the theoretical basis of the study. Next, read the discussion and implication sections of the articles. In this part of the journal article, authors discuss the implications of the study as a challenge to the theory or as further development or expansion of the theory.

A theory that was at one time believed to be valid can be questioned in the future. For example, new technologies can create new opportunities and circumstances for communication. Thus, theories of how and why interpersonal relationships develop over time may need to be reexamined in light of the extent to which these technologies are used in developing relationships.

Utility of Theory–Research Link

To the extent that a community of scholars accepts research findings and can agree on the theoretical propositions, theory has been achieved. But all theory should be judged by some aspect of utility (Lustig, 1986). The knowledge gained from the process of theory-building should be used "to suggest new questions that are worth answering, develop more accurate theories about human communication, communicate more effectively, teach others to communicate more effectively, create better human relationships, and improve the cultures and the environments within which we all live" (Lustig, p. 457). When the utility criterion is added as a test of the theory-building process, you can see not only that the theory–research relationship is reciprocal, but also that it is grounded in the practical issues of human communication (Keyton, Bisel, & Ozley, 2009).

In fact, theory is used four ways in the research process (Hoover & Donovan, 1995). First, theory provides patterns for interpreting data. Without working from or toward theory, research could produce results without an organizing framework. Second, theory links one study to another, helping to provide a continual conversation about our understanding of communication phenomena. Third, theory provides a framework for understanding how concepts and issues are important or significant in our interactions. For example, theorizing about communication apprehension and then conducting studies to validate those expectations helped researchers uncover the role apprehension plays in nearly every communication event in which we participate. Fourth, theory helps us interpret the larger meaning of research findings. For example, reading about how observers react to an apprehensive individual may cause you to monitor and manage your own apprehensiveness when speaking in public.

Scientific and systematic inquiry is a process of developing and testing theory. Direct relationships exist among questions asked, data observed, and theory development (Miller & Nicholson, 1976). Examine the deductive and inductive research models (see Figures 2.1 and 2.2). See how theory drives quantitative research? Alternatively, in qualitative methodology, observations tend to drive theory development. However, the selection of any particular quantitative or qualitative methodology does not guarantee that a study will result in theoretical development. Rather, a study must be designed to illuminate and examine underlying principles and propositions (Shapiro, 2002). Only then can its findings contribute to theoretical development.

Also recognize that the process of inquiry is not always linear. Nor can theory be developed or challenged in one study. Recall that science can be characterized by its replicable and self-correcting nature. Multiple studies are needed to replicate findings, just as multiple studies are needed to challenge and alter existing theory.

SUMMARY

1. Researchers seek answers to questions.
2. Library research can reveal if the answer to your question is available, but not known to you.
3. If the answer is neither known nor available, research must be conducted to uncover the answer.
4. Research can be a deductive or an inductive process.
5. The steps of the deductive process are identifying the research problem, reviewing existing theory, formulating a research question or hypothesis, designing the methods and procedures, gathering data, and analyzing and interpreting data.
6. The steps of the inductive research process are identifying the research problem, considering existing research findings, developing the research question, designing the methods and procedures, gathering data, analyzing and interpreting data, and developing a theoretical explanation.
7. Both the deductive and inductive research processes are circular and cyclical as the final step, asking new questions, starts the research process again.
8. The first step in both the deductive and inductive research processes—identifying the research problem—consists of identifying the topic or issue, turning the topic into a preliminary question or set of questions, conducting a library search, and adjusting the question, if necessary.
9. Evaluate your preliminary questions for their underlying assumptions, completeness, and clarity prior to conducting the library search.
10. Find scholarly articles published in academic journals or scholarly books.
11. When you find an article or book that may be helpful, take notes and document all the citation information.
12. Your preliminary question may require adjustment as you discover new information.
13. The abstract states the primary ideas presented in an article or chapter.
14. The literature review usually concludes with the researchers' formal research questions and hypotheses.
15. The discussion section includes the answers to the questions the authors raised.
16. Using what you found in the library search, organize your material by major and minor points, in chronological order, by answering a series of questions, or from the general to the specific or from specific to general.
17. Theory is developed and tested through research.

KEY TERMS

deductive

inductive

See the website www.mhhe.com/keyton3 that accompanies this chapter. The site contains a chapter summary, outline, and checklist. A PowerPoint presentation created by Dr. Keyton is also available for download, as well as a short multiple-choice quiz to check your learning. You will also find a list of Internet resources that provide further information about the issues in this chapter.

CHAPTER THREE

Introduction to Quantitative Research

Chapter Checklist

After reading this chapter, you should be able to:

1. Describe quantitative research and its assumptions.
2. Identify examples of quantitative research.
3. Explain analytic deduction.
4. Explain the five-component model for quantitative research.
5. Explain the role of hypotheses in quantitative research.
6. Assess the effectiveness of hypotheses in quantitative research.
7. Explain why research questions are used in quantitative research.
8. Distinguish among concepts, conceptual schemes, constructs, variables, and operationalizations.
9. Identify independent and dependent variables.
10. Explain the relationship between independent and dependent variables.
11. Explain the advantages and disadvantages of quantitative research.
12. Describe issues of reliability and validity that must be addressed in quantitative research.

When you think of research, you are likely to think of a laboratory experiment, which is what has traditionally been associated with scientific research. In communication research, lab experiments are only one of a variety of quantitative methods from which a researcher can choose.

This chapter provides a basic introduction to quantitative communication research. You will discover how quantitative methods rely on the identification of variables and the development of testable hypotheses and questions. Moreover, you will discover that the way in which the research question or hypothesis is written actually helps the researcher in selecting the research method. But do not conclude that quantitative research can answer all of our questions about human communication behavior. Some questions are better answered by qualitative research methods, which are introduced in Chapter 4.

WHAT IS QUANTITATIVE RESEARCH?

As the label implies, the unit of analysis in quantitative research is quantity (Anderson, 1996). Researchers use measurement and observation to represent communication phenomena as amounts, frequencies, degrees, values, or intensity. After phenomena are quantified, researchers compare or relate them using descriptive or inferential statistics. By using traditional quantitative approaches and statistical techniques, researchers bring greater precision and, as a result, some would argue, greater objectivity to the study of communication phenomena. A few examples will demonstrate the variety of quantitative research methods available to communication researchers.

Examples of Quantitative Research

In part, film ratings (i.e., G, PG, PG-13, R, NC-17) in the United States are based on characters' use of language, especially profanity. Many parents rely on these ratings to make appropriate media choices for their children. Although the rating system went into place in 1968, parents, media researchers, and policy makers still have concerns about the use of profanity in films, whereas others question whether the regulations are still needed. Cressman, Callister, Robinson, and Near (2009) designed a quantitative research study to identify what types of profanity were used and their frequency. The research team selected 30 of the top grossing teen films from the 1980s, 1990s, and 2000s that had received G, PG, and PG-13 ratings. G-rated films should not contain offensive language; PG-rated films suggest parent guidance because these films can contain some profanity; and PG-13-rated films caution parents because some of the language in the film may be inappropriate for children under 13.

How were quantitative methods used in this study? To answer their research questions and hypotheses, the research team counted frequencies of occurrence for language in the films that could be described in one of five categories: the seven dirty words that the FCC deems unspeakable for broadcast, sexual words, excretory words, strongly offensive, or mildly offensive. Across the 90 films coded, 2,311 instances of profanity were identified. Teen characters spoke about two-thirds (69.1%) of these words; teen males used more profanity than teen females or adults of either sex. While mild profanity was identified more frequently (57.1%), the seven dirty words were the second highest category (22.1%). By first identifying and then interpreting the frequency of occurrence of language in the different categories of profanity, the research team was able to demonstrate that there was a slight decrease in the use of profanity across the three decades. However, the use of profanity was still prevalent in the most recent set of films. Thus, the findings question the influence of the film rating system on films that teens will see.

Other quantitative studies are conducted with questionnaires or surveys. Advances in technology have changed the ways businesses operate and how job applicants interact with them. To understand the preferences of employers in receiving resumes and cover letters, Schullery, Ickes, and Schullery (2009) sent surveys by e-mail to all the organizations that recruit at their university. Responses were received from 140 nationally based U.S. companies and 92 multinational companies.

AN ETHICAL ISSUE

Giving Your Children Permission to Participate in a Research Study

To collect data from participants, researchers must ask for and gain the consent of participants. In addition to gaining participants' consent, researchers need the consent of a parent or guardian before individuals under the age of 18 can participate in an academically sponsored research project. If you were the parents of a 13-year-old, would you give your daughter or son permission to participate in a research project on dating? Drinking? Drug use? Why would some parents object to their teenager's participation? Is there any way the researcher could overcome these objections? What are the potential benefits of having teenagers participate in research projects like these?

Purposely avoiding the terms *online, web-based,* or *electronic,* the survey asked organizational representatives to provide answers to questions about the type of resume they prefer to receive, how they prefer to receive resumes, and if they prefer a cover letter with the resume. Each question could be answered with a set of response options. Frequency counts for each response were reported. The research team found that regardless of the company's size, type, geographic range, or the job function of the job applicant, employers preferred that resumes be formatted in the traditional chronological order. Companies did differ in how they preferred to receive resumes. Generally, companies preferred to receive resumes as e-mail attachments (46%) or through their websites (38%). Only 7% preferred receiving resumes by mail. These preferences were not related to geographic area or type of company. But smaller organizations did prefer to receive resumes by e-mail, and resumes for positions in human resources were preferred to be received through company websites. Interestingly, a little more than half (56%) of the companies preferred to receive a cover letter with the applicant's resume. Using surveys or questionnaires is a very popular quantitative method. Chapter 9 explores this topic in detail.

Communication researchers also use experimentation to capture quantitative information about communication issues. Most of us use social networking sites, and, in our profiles, most of us describe ourselves in favorable ways. But what impressions do others have of us by viewing our Facebook page, for example? Would their impressions change if others posted comments about our physical attractiveness that were different from how we describe ourselves? Walther, Van Der Heide, Harnel, and Schulman (2009) investigated this question with an experiment. Using mock-ups of a Facebook profile page, the research team was able to manipulate the information the participants saw. Some participants saw self-statements or descriptions posted by the owner of the profile page; other participants saw statements posted by the profile owner's friends. Some of the friends' statements described the profile owner as attractive (e.g., "If only I was as hot as you); other statements described the person in unattractive ways (e.g., "Have you lost weight? Good job keep workin' at it"). Research participants provided evaluations of the profile owner's attractiveness and their honesty. In terms of attractiveness, comments made by the profile owner's friends were more influential. That is, friends' descriptions of attractiveness were more trusted than the physical descriptions provided by profile owners.

In another experimental design, Ivory and Kalyanaraman (2009) asked participants to think of and then write down the most violent video game with which they were familiar; another set of participants were not asked to identify a video game. Next, participants were asked to rate the degree to which they believed the specific video game, or video games in general, would cause others to be aggressive or violent. The research

team wanted to test the hypothesis that "participants' perceptions of violent video games' effects on aggression will be greater when considering a specific game compared to violent video games in general" (p. 4). The research findings did not support the hypothesis. Rather, just the opposite was found. Participants who named a specific video game believed that the game would cause others to be less aggressive or violent than those participants who were not asked to identify a video game.

The point of this experiment was to understand what factors influence people's perceptions about the effects of violent video games. It was an interesting experiment because the research team did not have participants view or play any video games. Rather, the manipulation was invoked by simply asking some participants to think of and write down the title of a violent video game. Thus, the results demonstrate that violent video games in general caused participants to believe that video games were more likely to cause aggression and violence. Alternatively, when participants wrote down the title of a violent video game, their perceptions about potential aggression and violence were lower.

These are just four examples of ways in which communication researchers used quantitative methods. One element underlying these examples that may not be apparent to you, but that needs discussion, is the pattern of reasoning used by these researchers. We examine that next.

Deductive Reasoning

Quantitative research relies primarily on deductive reasoning (Hawes, 1975). This means that the researchers select a theory, or theories, as the basis of the propositions that are tested in the study. In this case, the logic flows from the generalized (the theory) to the specific (the research conclusion). In general, the researcher hopes that the research process supports, or verifies, what the theory proposes to be true.

If the data and results do not support hypotheses derived from the theory, then the researcher looks for an alternative explanation. Perhaps the theory, as it was developed, is deficient or incomplete. Therefore, the results must be faulty because they are a direct result of testing the theory. Or the methods or procedures followed could be faulty. In this case, the researcher develops a new research design for testing the theoretical propositions and collects new data.

A Model for Conceptualizing Quantitative Research

The deductive research model presented in Chapter 2 is a general overview of the research process: It gives the basic steps and can be applied to most quantitative research projects. But with both quantitative research and qualitative research (see Chapter 4), more specialized models are needed to guide us through selecting and developing the research plan for a specific study. The model for conceptualizing quantitative research shown in Figure 3.1 is the model that will guide us now.

Starting at the top left of the model, the first component is the research purpose. Because the researcher is familiar with the research literature and has developed some questions about communication issues, she or he begins with an overall purpose or objective. For example, I am interested in how a dysfunctional group member can take over a group's interaction to the point that the ineffective member replaces the task as the focus of the group. So my research purpose is to study that communication phenomenon.

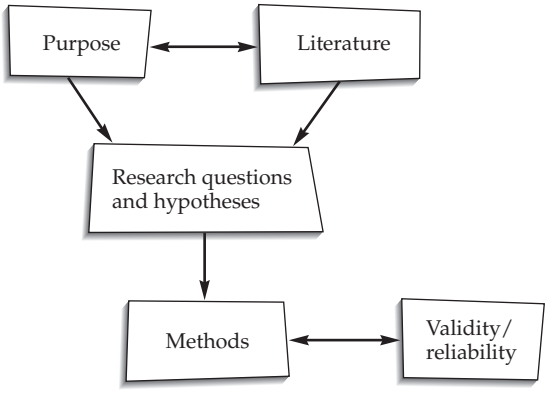

FIGURE 3.1 A Conceptual Model for Quantitative Research

Notice that the purpose component alone does not drive the model. The traditions of social science require that researchers use literature as a basis for their research, so my desire to study dysfunctional group members is framed within the context of the research literature and the contexts of real groups that I have observed experiencing this phenomenon. I take information (and motivation) from my original purpose, the research literature, and my experiences with groups. Balancing what I know as an academic and what I know as a group facilitator leads me to the research questions or research hypotheses that will guide my study and selection of quantitative methods.

Research questions and research hypotheses are central to the quantitative research process. No quantitative study can be done without one or a combination of these. This third component dominates the quantitative research methods process. Later in this chapter we will explore these in greater detail. But, for now, recognize that without one or several research questions or research hypotheses, there is nothing to direct or define the research process.

The fourth component of the quantitative research model is the selection of the research methods for the project. Generally, quantitative researchers ask questions about differences and relationships. In other words, how are communication phenomena different? Or how are communication phenomena related? Either of these two forms is acceptable, but they require different types of statistical approaches. If I want to study the difference between dysfunctional members and functional, or effective, members, then I choose a quantitative method that will help me examine and illuminate those differences. If I want to study how the dysfunctional member influences the group's decision making and conflict management, I would choose a method that illuminates the relationships among the degrees of dysfunctional, decision-making, and conflict management behaviors.

Looking at some specific examples will help you distinguish between instances in which differences are the focus of the research and instances in which relationships between variables are the focus. Think about your interaction with your significant other and your interaction with your supervisor. First, think about how the two relationships are different. Look at Table 3.1 to see what I mean.

In comparing the interaction with a significant other to the interaction with a supervisor, it is easy to identify several variables on which there will be differences (for example, status, motivation, and level of intimacy). Notice how a difference can be extreme, as in the status and motivation examples. Also notice how the differences may be more moderate, as in the level of intimacy of the conversation. In each of these

TABLE 3.1 Looking for Differences Between Two Types of Interaction

Variables of Potential Differences Between the Two Relational Types	*Interaction with Significant Other*	*Interaction with Supervisor*
Relative status of other person in the relationship	I consider this person to be *my equal* in terms of power and status.	Due to the organizational hierarchy, this person has *more power* and status in the organization than I do.
Motivation for relationship	We are friends. I *voluntarily* developed this relationship.	I was assigned to my supervisor's work unit. This relationship *is not voluntary.*
Level of intimacy in conversations	We *share personal information* with one another.	I do *share some personal information* with my supervisor, especially when we eat lunch together.

TABLE 3.2 Looking for Relationships Between Two Types of Interaction

Potential Relationships Between the Two Relational Types	*Interaction with Significant Other*	*Interaction with Supervisor*
Number of conflicts	I *frequently* have conflicts with my significant other.	I *frequently* have conflicts with my supervisor.
Degree of satisfaction with interaction	I am *very satisfied* with my interaction with my significant other.	I am *not satisfied* with my interaction with my supervisor.
Frequency of interaction	My significant other and I *talk very frequently.*	I *talk* to my supervisor *only when necessary.*

cases, the researcher would quantitatively measure status, motivation, and level of intimacy for each participant twice—once for each relationship type. Then the researcher would compare the scores for interaction with the significant other to the scores for interaction with the supervisor to see if a difference existed.

Alternatively, the research project could be designed to explore how the two types of interactions are related to one another. Examine Table 3.2 to find these examples. In looking for how interaction in the two relational types is related or similar, the researcher would again obtain a quantitative measurement of number of conflicts, degree of satisfaction, and frequency of interaction for each relational type. Then the researcher would examine the pairs of scores to see how they relate to one another. Notice how the scores may be very similar, or highly related, as with the number of conflicts. Or the scores can be related, but in opposite directions, as with satisfaction with interaction and frequency of interaction.

Thus, we can look for the differences between these two relational types, or we can look for ways in which interaction in the two relational types is related. The point here is that almost any communication phenomenon can be examined for its differences to a similar communication phenomenon, or a communication phenomenon can be examined for how it relates to a similar communication phenomenon. Can you think of other elements that may differ or be related with respect to relationships with significant others and supervisors?

Returning to my example of dysfunctional group members, if I focus on differences, I might look for ways in which functional and dysfunctional group members deal with conflict, facilitate the group's decision making, or challenge the group's leadership. If I focus on ways in which these two types of group members are related, I might want to focus on the degree to which each type of group member possesses communication competence, or how similar the types of group members are in their communication style. To highlight differences, one set of statistical techniques is used. To highlight relationships, another set is chosen. These statistical techniques are covered in Chapters 11 and 12.

Notice that the final component of the quantitative research model is connected only to the methods component and that the connection is reciprocal (see Figure 3.1). This last component is an examination of the validity and reliability of the data collected through the method selected. Usually the researcher will make methodological choices and then assess those choices for their impact on *validity*—how truthful the data will be—and *reliability*—how consistent the data will be. These issues must be addressed before the research is undertaken and any data collected, for there is little opportunity to adjust the research method after the project is started. One of the assumptions of quantitative methods is that all participants are treated similarly; procedures or process should not change as you discover errors or lapses in your planning.

After the researcher has addressed each of these five components, he or she moves

through the quantitative research process in a linear fashion. Once the methods are designed, the researcher selects participants, collects and analyzes data, and then writes the research report. As demonstrated in Figure 2.1, findings from the current study are used to extend or challenge the current state of theory. New questions are formulated and the research process begins again. For now, though, we need to return to and examine in detail each step in conceptualizing the research project because these steps provide the foundation for quantitative research projects.

CREATING THE FOUNDATION FOR QUANTITATIVE RESEARCH

After identifying the research problem and turning that topic into a preliminary question or questions, as described in Chapter 2, researchers must further specify the concepts identified in their question. These conceptual definitions are based on theoretical information or past research studies. Generally, researchers build on the work of others and use existing concepts and definitions unless they are inadequate or inappropriate (Katzer et al., 1978).

A **concept,** or the thing you want to study, represents a number of individual, but related, things. It is an abstract way of thinking that helps us group together those things that are similar to one another and, at the same time, distinguish them from dissimilar other things. A concept can be an object, an event, a relationship, or a process. Examples of concepts include a faulty argument, an effective public speaker, a conflict between spouses, leadership, underrepresentation of minorities on prime-time television shows, and so on. Even though they are intended to represent a class of things that have common characteristics, a concept does not have a fixed or precise meaning or definition (de Vaus, 2001). With respect to the research literature, concepts are generally introduced early in the literature review with a general description.

In some cases, a set of concepts can be connected to form a **conceptual scheme.** For example, a researcher could identify ways in which consequence is demonstrated in prime-time television dramas (for example, characters admit guilt and take responsibility, deny responsibility, assign responsibility to others, and so on). Individually, each concept describes a unique process. But as a group, the concepts still retain common characteristics. Together, they form a conceptual scheme that specifies and clarifies the relationships among them (Kibler, 1970).

The theoretical definition of a concept is a **construct.** Concepts can become constructs only when they are linked to other concepts. The linking between and among concepts is part of the theoretical definition. To be used in a research study, however, a construct must also be assigned an observable property, or a way for a researcher to observe or measure it. Obviously, a construct could be observed or measured in many ways. Thus, researchers use the term **variable** to identify the theoretical construct as it is presented in research questions and hypotheses, and the term **operationalization** to denote how the variable is observed and measured. See Figure 3.2 for a visualization of how concepts, constructs, variables, and operationalizations are related to one another in the research process. Sections on identifying and operationalizing variables are presented later in this chapter.

It is important to note that both concepts and constructs are arbitrary creations of researchers (Kibler, 1970). As a result, in reading many research reports about the same topic, you are likely to find considerable variation in how scholars describe concepts and constructs. Generally, researchers describe the theoretical foundation of a study in the literature review. This is where concepts and constructs are introduced. Then, in the hypotheses and research questions, constructs are further defined as variables. Operationalizations of each variable are presented in the methods section of written research reports.

Variables are the elements of interest to researchers. Finding new descriptions, explanations, or predictions for variables is the primary motivator for conducting scholarly research. To better understand how variables are used in the research process, we need to consider hypotheses and research questions.

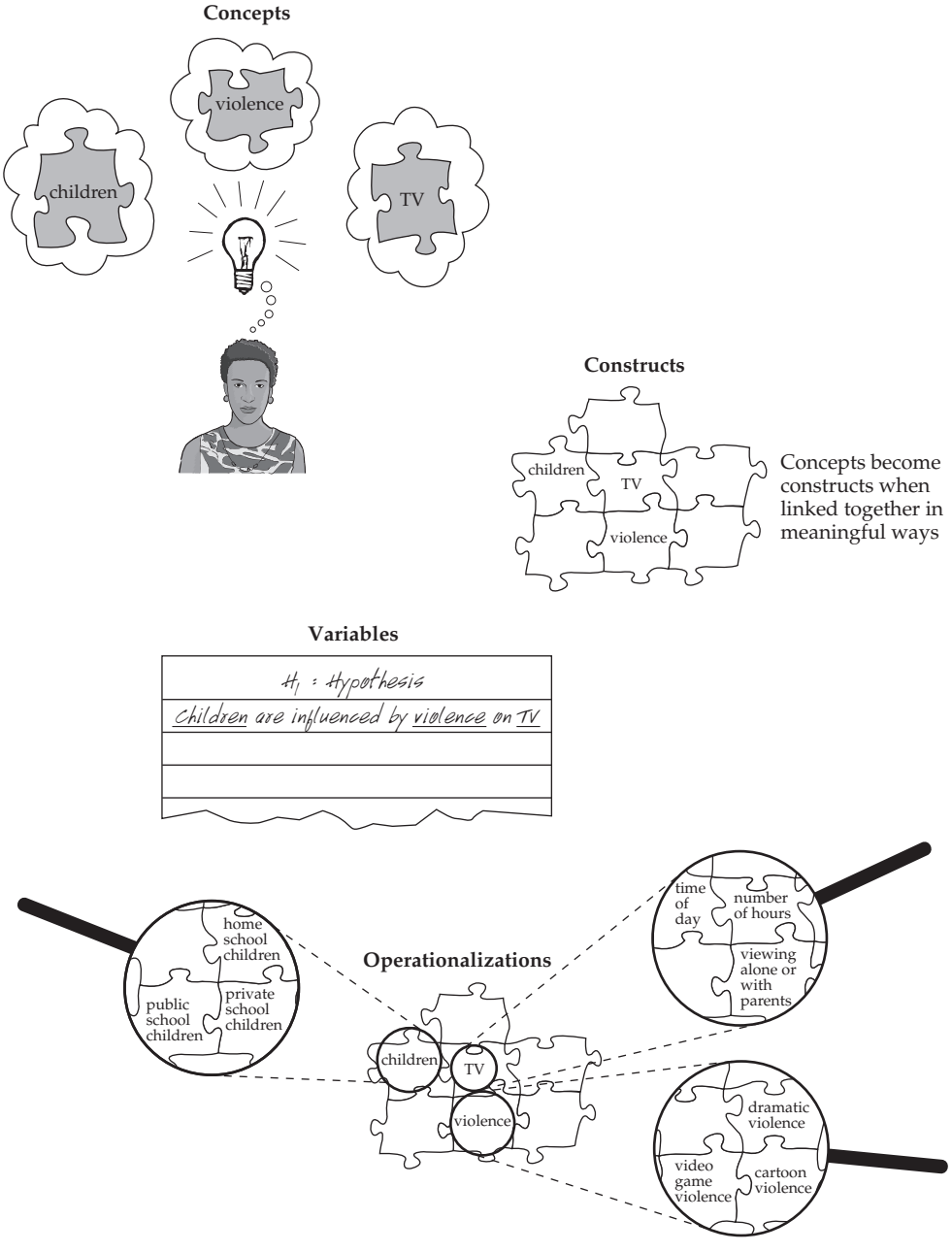

FIGURE 3.2 Moving from Concepts to Constructs to Variables to Operationalizations

RESEARCH HYPOTHESES FOR QUANTITATIVE RESEARCH

Scholars rely on hypotheses to direct their quantitative inquiry. A hypothesis is an educated guess, or a presumption, that is based on a scholar's review of the research literature. It describes a logical explanation of the difference or relationship between two or more variables. To be tested through research, the consequences of the hypothesis must be observable. In fact, the researcher designs the research study to test the relationships described in the hypothesis.

For example, the following hypothesis describes a relationship between romantic partners' anticipation of more online interaction and their uncertainty about the relationship (Pauley & Emmers-Sommer, 2007, p. 413).

> Hypothesis: Anticipation of future interaction with an online partner is associated with greater reported uncertainty reduction in relationships.

The hypothesis proposes what the relationship will be. When those involved in online romantic relationships have the expectation of more interaction with their online relational partner, their uncertainty about that relationship will be reduced. A hypothesis *states* the nature of the relationship between variables. This is different from phrasing the relationship as a research question, which would ask *what* the relationship would be.

As another example, a research team examined differences in the politeness of rejection messages. Unrequited love is when one person has romantic feelings for another person, but the other person does not want to be romantically involved. The person with the romantic feelings is labeled as the would-be lover. In this study, research participants were asked to think about a time when they told someone they were romantically interested in him or her and the other person indicated that romantic interest was not mutual. Participants reported on rejections from acquaintances, friends, or romantic partners. Based upon the literature, the research team wrote a hypothesis that predicted which type of relational partner will deliver the most polite rejection (Young, Paxman, Koehring, & Anderson, 2008, p. 58).

> Hypothesis: Rejection messages from friends will be perceived by would-be lovers as more polite, pleasant, and appropriate than rejection messages from romantic partners and acquaintances.

Directional Hypotheses

Return to the hypothesis about the politeness of rejection messages. In this case the researchers expect to demonstrate that would-be lovers will report that one type of relational partner (friends) will be more polite than acquaintances or romantic partners when they reject the romantic request. Because the hypothesis explicitly states which type of relational partner will be more polite, the hypothesis is directional. Thus, a **directional hypothesis** is a precise statement indicating the nature and direction of the relationship or difference between the variables.

Nondirectional Hypotheses

A nondirectional hypothesis is less explicit. Continuing with the rejection message example, a nondirectional hypothesis could be

> Hypothesis: Would-be lovers will report differences in the politeness of rejection messages based on relationship type (acquaintance, friend, romantic partner).

The **nondirectional hypothesis** states that a difference will occur but does not state the direction of the difference. Acquaintance, friend, and romantic partner are three categories of the *relationship type* variable examined in the study. The nondirectional hypothesis indicates that there will be a difference in the degree of politeness among the three types of relational partners, but does not predict which type of partner will deliver a more polite rejection message. Some researchers judge directional hypotheses to be more sophisticated than nondirectional hypotheses because they more explicitly state what differences will be found. Both types of hypotheses are found in the communication research literature.

Assessing Hypotheses

The following criteria can help you assess the clarity and utility of hypotheses (Hoover & Donovan, 1995; Pyrczak & Bruce, 2007; Salkind, 2008). The first criterion asks evaluative questions about wording, such as, Is the hypothesis simply stated? Is the hypothesis stated as a single declarative sentence? Are at least two variables identified?

The second criterion focuses on the variables in the hypothesis. Are the variables clearly specified? Can the variables be measured by techniques you know how to use? If not, you will need to learn the appropriate measurement or observation method or ask someone to help you with this aspect of the study.

A third criterion for assessing hypotheses is to examine how the differences or relationships between variables are stated. Are they stated precisely? A good way to test this is to explain a hypothesis to someone who is unfamiliar with research methods. If you can describe it to someone else, the difference or relationship in the hypothesis is likely to be precise enough to use in a research study. The fourth criterion asks if the hypothesis reflects a theory or a body of literature. In other words, is the hypothesis logically supported by or based on previous research?

The fifth criterion asks if the hypothesis is testable. In other words, can the difference or relationship between the variables be observed or demonstrated in some way? This criterion is crucial to conducting the research study. The method, or the way in which the study is conducted, must match the hypothesis. Evaluating hypotheses is important because they guide how the research project is developed and structured.

Null Hypotheses

Although a scholar spends time developing research hypotheses from the published literature, these are not directly tested. Rather, a statistical test is performed on the **null hypothesis**, or the implicit complementary statement to the research hypothesis. In using a statistical test, the researcher hopes to reject the null hypothesis and, in effect, validate the alternative, or the research hypothesis. A null hypothesis states that no difference or no relationship, except one due to chance, exists between the variables. As you can see, the null hypothesis is in direct opposition to the research hypothesis. According to the traditions of science, the null hypothesis must be assumed to be true until support for the research hypothesis can be demonstrated.

Although it is unlikely that you would see a null hypothesis presented in scholarly work, it is helpful to think through what the null hypothesis would be. As an example, refer back to the research hypothesis about unrequited love rejection messages. The research hypothesis was presented as

> H: Rejection messages from friends will be perceived by would-be lovers as more polite, pleasant, and appropriate than rejection messages from romantic partners and acquaintances.

The null hypothesis could be written as

> H_0: There will be no difference in would-be lovers' perceptions of the politeness of rejection messages from acquaintances, friends, or romantic partners.

It could also be written in one of the following ways:

> H_0: Would-be lovers will not report differences in perceptions of the politeness of rejection messages delivered by acquaintances, friends, or romantic partners.
>
> H_0: Degree of perceptions of politeness in rejection messages reported by would-be lovers will not vary by relational partner type (acquaintance, friend, romantic partner).

Notice that the symbol H indicates the research hypothesis and the symbol H_0 indicates the null hypothesis. In some journals, you may also see the symbols H_1 or H_{alt} to indicate the research hypothesis.

Research Traditions in the Use of Hypotheses

You should be aware of several traditions regarding the use of hypotheses (Kibler, 1970). The first is that hypotheses are always tentative. Even when support for a hypothesis is found, support is never considered absolute. Knowledge is

developed over time, and the continual efforts of researchers contribute to the development of theory as they seek to confirm or disconfirm hypotheses. Thus, one study cannot absolutely confirm or disconfirm any relationship or difference between or among variables.

Researchers honor the second tradition when they present the research hypothesis. Although not explicitly stated in a journal article, the null hypothesis is assumed to be in direct opposition to the research hypothesis. The research hypothesis, the one the researcher wants to confirm, states the way in which the variables are different or the way in which the variables are related to one another. Alternatively, the null hypothesis, even when not given, implies that no difference exists between the variables or that the variables are not related in any way. In nearly every case, the research, or alternative, hypothesis is the focus of a research project.

RESEARCH QUESTIONS IN QUANTITATIVE RESEARCH

Why would a researcher ask a research question instead of stating an educated guess with a hypothesis? There are several occasions when asking a research question has more utility. The first is when little is known about a communication phenomenon. For example, some communication phenomena—particularly those linked to the use of media or technology—enter the mainstream faster than researchers can study their effects. As a result, Campbell (2008) had few research studies on which to base research hypotheses when he explored how mobile phone use in public settings was influenced by cultural and individual differences. Although studies had looked at mobile phone use and the perceptions of users, there were few studies upon which to develop hypotheses regarding how individuals interpret rules or norms for mobile phone use in public settings. Thus, the following research question was asked:

> RQ: To what extent are individualism and collectivism related to assessments of mobile phone use in public settings that support different levels of focus?

Another opportunity for researchers to use research questions arises when several explanations could exist for the proposed relationship. For instance, Yoo's (2009) literature review offered two competing evaluations for how likeable someone is if they complain or share negative information with a conversational partner. One explanation is that sharing negative information can be perceived as a sign of bonding between two people. The other explanation is that sharing negative information is much like gossiping and previous research demonstrates that when people share negative information while gossiping, their likeability is decreased. Which is a better explanation? Yoo developed and tested this research question to find out: "Will participants who share only negative information about a target rate a greater liking of their partner than participants who share positive or combined information?" (p. 33).

A research question makes more sense in this instance because previous research could not help the researcher make an educated and informed guess between the two explanations. In both of these cases, the research question is an opportunity for the researcher to describe communication phenomena. Research questions are primarily tools of descriptive research.

TYPES OF VARIABLES

In hypotheses and research questions for quantitative studies, researchers make the object of their study more explicit by further specifying a construct as a variable. A *variable* is an element that is specifically identified in the research hypotheses or questions. The literature review may describe several related concepts and constructs, whereas the hypotheses and research questions identify a more limited set of variables to be explored.

The study of communication from a social science perspective borrows heavily from the traditional science disciplines. As a result, quantitative research relies on the study of variables. In social science, variables are the properties or characteristics of people or things that vary in quality or magnitude from person to person or object to object (Miller & Nicholson, 1976).

Simply, to be a variable, the element must vary. In other words, the variable must have two or more levels. For example, sex is a variable as it varies between male and female. Leadership can be a variable, as leaders can be described as autocratic or democratic. Communication apprehension, like other constructs measured by questionnaires, is a variable: Individuals' scores can have many levels, ranging between a potential minimum and maximum score.

Communication phenomena or communication-related phenomena do not always take on the role of variables in communication research. For example, even though sex varies, it cannot be a variable if the researcher studies only the leadership abilities of women. Leadership ability would be a variable; sex would not. In another example, leadership style cannot be a variable if the researcher examines only ways in which democratic leaders encourage group members to participate. In this case, encouragement of group member participation would be a variable; democratic leadership style would not. Something can be identified as a variable only if it fluctuates in the research study (Kibler, 1970). This can be confusing because not every concept that can vary and act as a variable does so in every research study.

Some variables are easy to view and count. They are tangible and observable. For example, it is easy to identify and count what type and how many hand gestures a person makes while arguing. Alternatively, it may not be possible to directly view some variables. In these cases, researchers develop constructs to represent properties that control other events. For example, communication competence is a construct that was developed by communication scholars to represent perceptions of effectiveness and appropriateness of interaction. There is indirect evidence that this construct exists (after all, most people have ideas about what constitutes communication competence), but the construct itself is invisible. Communication researchers willingly accept constructs because they are able to demonstrate differing effects produced by variables. For example, competent communicators produce different effects on their receivers than incompetent communicators do. Similarly, it is impossible to see an attitude about violence on television. But a researcher can see the behavioral effects of your attitude when you report liking shows with violent content or when you change the channel to avoid watching such programming.

Whether they are tangible or constructed, when they are included in research questions or hypotheses, variables must also be identified as independent or dependent. Simply, the independent variable is presumed to have an effect on or cause a change in the dependent variable. The sections that follow describe how the two types of variable are used in research and explain the nature of the relationships between and among variables. In quantitative research, the researcher should specify which variables are independent and which are dependent.

Independent Variables

Variables manipulated by the researcher are called **independent variables.** Presumably, the manipulation, or variation, of this variable is the cause of change in other variables. Technically, the term *independent variable* is reserved for experimental studies (see Chapter 8) in which the researcher has control over its manipulation. In some research reports, independent variables are referred to as **antecedent variables, experimental variables, treatment variables,** and **causal variables.**

The independent variable is manipulated because the researcher wants to assess if different types or values of the variable result in some relationship with another observed phenomenon, or the dependent variable. If the effect or relationship occurs, the researcher presumes that the independent variable caused the change in the dependent variable.

For example, Horan and his research team (2009) wanted to examine how illnesses that are generally invisible to others would influence the type and amount of communication from a conversational partner. Participants in the study read a hypothetical scenario about a new neighbor. There were three scenarios. In one scenario, the target had cancer. In a second scenario, the target was HIV+. In the third condition, the target was healthy. Use of the three scenarios was meant to

DESIGN CHECK

What Is Sex? What Is Gender?

Many quantitative communication studies use sex and gender interchangeably as an independent variable. Unfortunately, many authors do not give their operationalization of this variable. When sex or gender is not operationalized, it is probably safe to assume that the researcher had participants self-report their biological sex—male or female. Of course, biological sex is not the same as one's gender or psychological orientation to sex—for example, feminine, masculine, or androgynous. There is a difference in being female and being feminine. This confusion has become even greater because some editors and publishers have requested that the more politically correct term *gender* be substituted for the more traditional term *sex.* If sex or gender is not operationalized, read the methods section carefully to determine if participants self-reported this information, if researchers assumed this information about participants, or if participants responded to a measuring instrument. If in doubt, use the terms as they are used by the authors of the published research reports.

manipulate the independent variable of illness to see how research participants would communicate with their hypothetical new neighbor.

Traditionally, the independent variable is manipulated in the context of an experiment to produce a change in the dependent variable. If all communication research were conducted as experiments, we could end our explanation of independent variables here. However, communication researchers use experimental, quasi-experimental, and descriptive research designs (each of these is explained in detail in Chapter 8). Whereas experimental research designs use researcher manipulation of the independent variable, other quantitative research designs do not. In these cases, the researcher relies on natural variation in the independent variable to produce different effects on the dependent variable. In those instances, the term **predictor variable** is preferred and should be used in descriptive research designs (for example, survey research). Researchers are still interested in the predictor variable's effect on other variables, but distinguishing between the two terms helps remind us of this key difference. A few examples will make this distinction clearer.

In a study of how immigrants are socialized into American culture, Erbert, Perez, and Gareis (2003) used country of origin and sex as independent variables in their statistical tests. Obviously, the research team could not alter or change these aspects of the study's participants. Thus, these two variables varied naturally, and the research team used information participants provided to code them as being from one of four world regions (i.e., Americas, Asia, Europe, or Middle East) and as female or male. Thus, both country of origin and sex had two or more levels and could be used as predictor variables.

In a study of how people maintain romantic relationships (Dainton, 2003), relational equity was used as an independent variable. During the data collection procedures, the participants responded to questionnaire items that allowed the researcher to determine if participants perceived they were in equitable romantic relationships, or in romantic relationships in which they were benefiting more or less than their partner. Thus, the researcher used the natural variation in participants' reports of their relational equity to create this predictor variable for the study.

As you can see, it is better to describe the independent variable as the variable that alters or changes the dependent variable. The researcher does not always manipulate it. In many cases, variation in the independent variable occurs naturally as a characteristic of the population under study. Any change or difference in the

independent variable is the presumed cause of a change in the dependent variable if an experimental method is used. Causality is weakened if the researcher does not directly manipulate the independent variable, but it would be impractical to conduct all communication research from this experimental framework. Generally speaking, however, the independent variable is the variable a researcher predicts from, whereas the dependent variable is the one the researcher predicts to (Kibler, 1970).

Dependent Variables

Even though the independent, or predictor, variable causes the change, the dependent variable is of primary interest to the researcher, who is trying to describe, explain, predict, or control changes in it. The **dependent variable** is influenced or changed by the independent variable. Sometimes in descriptive research designs, the terms **criterion variable** and **outcome variable** identify the dependent variable. Regardless of what it is called, logically a researcher cannot have a dependent variable without an independent variable, and vice versa.

Changes in the dependent variable are a consequence of changes in the values or levels of the independent variable. For example, in a study of what type of content appears in the news tickers (or crawlers) of cable news network (CNN, FOX News Channel, MSNBC), one hypothesis stated (Coffey & Cleary, 2008, p. 897):

> H_1: Cable news networks use their news tickers for overt promotional purposes.

In this case, the independent variable appears to be cable news network with the CNN, FOX News Channel, and MSNBC as different categories. But close reading of the methods section of this research article reveals that the difference in the three categories of the independent variable is really based on the parent company's ownership structure (i.e., degree of integration, percent of revenue contribute to total company revenue). As the researchers explained: "While all three cable networks are owned by horizontally and vertically integrated media companies, each of these parent companies differs in terms of its holdings and the percentage stake represented in each media sector. These structural differences were expected to have directional effects upon the networks' ticker content" (p. 897). Researchers measured the dependent variable, ticker content, by counting the instances in which overt messages, such as "Go to cnn.com for the latest developments," appeared in 15 hours of programming. As suggested by the hypothesis, the research team wanted to see if overt promotional messages were used by these news networks. Indeed, they found that CNN, and to a smaller extent, Fox, used their news crawl space for self-promotion. Thus, the dependent variable is the variable the researcher is trying to explain in a research project (Kibler, 1970).

The Relationship Between Independent and Dependent Variables

In quantitative research, the dependent variable is selected first because it is the primary topic of the research study (Thompson, 2006). Reread the hypothesis just presented. Ticker content, or what information is presented on news tickers, is the primary research topic. Thus, ticker content is the dependent variable. Then, logically, the researchers start to investigate what independent variables would influence or cause change in the dependent variable. When a researcher is looking to describe, predict, or explain differences or relationships, a hypothesis must have at least one independent and one dependent variable. Variables are identified as independent and dependent to establish the presumed relationship between them.

How many independent and dependent variables can a researcher specify? That depends on the nature or complexity of what the researcher wants to explain. Most important, however, the number of independent and dependent variables dictates which statistical test will be used. We will review these distinctions in Chapters 11 and 12 as the most common statistical tests are described and explained. But, for now, analyzing a hypothesis from a research report will help you understand the nature of the relationship between independent and dependent variables.

Sparks, Pellechia, and Irvine (1998) wanted to study how television news affects viewers' beliefs about UFOs (unidentified flying objects). They argued that although many people believe that the mass media play a role in misleading people so that they accept paranormal events like UFOs, little research has provided evidence to substantiate that claim. Thus, this research team designed an experiment to test the possible impact of news reports about UFOs on subsequent UFO beliefs. Their hypothesis was

> H: Subjects who view a high credibility, one-sided news report that supports the existence of UFOs will, subsequently, express greater belief in the existence of UFOs than will subjects who view a two-sided news report from the same program. (p. 287)

As a student, of course, you hope that the authors of the research report clearly identify which variables are independent and which variables are dependent. This is not always the case. Even if it is, you should be able to read the research article and verify the independent and dependent variables. One way to do so is to look for what changes or varies in the hypothesis statement. Examine Table 3.3. By comparing each mention of each element, we can determine the variables and then assign them as independent or dependent.

The authors made no distinction between the two mentions of "subjects" in the hypothesis, so "subjects" is not a variable. Likewise, there is no distinction in the use of "view." Thus, viewing is not a variable.

The use of "high credibility" could imply a comparison to low credibility. But the researchers do not offer an alternative to "high credibility." Thus, it does not appear that the researchers are using the credibility of news reports as a variable. This is also apparent in the author's use of "supports the existence of UFOs."

Reread the hypothesis. The authors explicitly state that viewers of the one-sided news report will express greater belief in UFOs. Also notice their use of the word "than." This word usage and sentence construction implies that the viewers of the one-sided news report will differ from viewers of the two-sided news report. Thus, the authors have implied a variable—belief in UFOs.

The second type of comparison is when differences are explicitly stated. The authors make a clear and explicit distinction between one-sided and two-sided news reports. So type of news report (one-sided or two-sided) must be a variable.

Which variable is the independent variable and which variable is the dependent variable? We could assume from the way the hypothesis is written that the authors use type of news report as the independent variable because they suspect that the variation in this element will cause a change in viewers' beliefs in UFOs, the dependent variable. However, it is always a good idea to read the methodology section of the research report to confirm your identification of variables and assignment of variables as independent and dependent, and to see exactly how the researchers measured or observed their variables.

Table 3.3 Determining Variables from the Elements of a Hypothesis

First Mention of Element	*Second Mention of Element*	*Type of Comparison*	*Type of Variable*
Subjects	Subjects	No distinction	—
View	View	No distinction	—
High credibility	—	No alternative given	—
One-sided news report	Two-sided news report	Explicit comparison	Independent variable
Supports the existence of UFOs	—	No alternative given	—
Greater belief in UFOs	(Less belief in UFOs)	Implied comparison	Dependent variable

OPERATIONALIZING VARIABLES

Whether variables are used as independent or dependent variables in hypotheses or questions, researchers must take one additional step to actually use the variables in a quantitative study. Each variable must be operationalized, or observed or measured in a specified way. Most variables can be operationalized in multiple ways. That is why an operationalization specifies the concrete steps or processes for creating and measuring the variable. The operationalization is specific enough that others reading the description of the operationalization in the research report can follow it (Miller & Nicholson, 1976).

Researchers use three criteria for selecting among available operationalizations. First, which operationalization is practical and useful in their study? Second, can a justifiable argument be developed for this operationalization? Third, does the operationalization selected coincide with the conceptual definition?

A good example of the specificity needed for operationalizations is demonstrated in a study that examined the influence of message design strategies on changes in attitude and use of marijuana (Harrington et al., 2003). The first hypothesis of the study stated:

> H_1: Compared to low sensation value anti-marijuana messages, high sensation value anti-marijuana messages will lead to greater attitude, behavioral intention, and behavior change. (p. 22)

Although the research team identifies the variables in the hypothesis, there is not enough information to replicate the research study. What are low sensation value and high sensation value messages? How do you measure attitude, behavioral intention, and behavior change?

In the methods section of their study, the research team specifically defined, or operationalized, these variables. To create the high sensation and low sensation value messages,

TRY THIS!

Identifying Independent and Dependent Variables

Following the process shown in Table 3.3, identify the independent and dependent variables for each hypothesis in the following table.

Hypothesis	*Independent Variable*	*Dependent Variable*
Family conversation orientation is positively related to adult children's emotional intelligence. (from Keaten & Kelly, 2008)	Family conversation orientation	Adult children's emotional intelligence
There will be a negative effect of perceived peer norms for thinness on the body esteem of young women. (from Krcmar, Giles, & Helme, 2008)		
Indirect forgiveness will be more frequently used by friends than by dating partners. (from Merolla, 2008)		
There is a linear relationship between the number of friends a profile owner has and observers' perceptions of extraversion. (Tong, Van Der Heide, Langwell, & Walther, 2008)		

the research team reviewed public service announcements (PSAs) currently being shown on television. Identifying those that were high and low sensation, the research team then used focus groups to verify their characterizations. With this information, the team created high sensation value PSAs that featured high intensity, loud and driving music, quick and multiple edits, unusual camera angles, and extreme close-ups. Alternatively, low sensation value PSAs featured slower paced music, fewer edits, more typical camera angles, and no extreme close-ups. Thus, the authors clearly described what constitutes a high sensation and a low sensation value message and explained specifically how those messages were created.

The researchers also explained how they operationalized each of the other three variables—attitude change, behavioral intention change, and behavior change. Attitudes toward marijuana use were measured with questionnaire items from a study done as an evaluation of a national drug abuse campaign. Behavioral intention toward using marijuana was measured with this and similar items: "How likely is it that you will use ____ in the next 30 days?" Marijuana use behavior was measured with items that asked if participants had used marijuana in the past 30 days, the past year, or at any time during their lifetime. For each variable the research team provided examples of the items and indicated the direction of the desired change (i.e., should watching a PSA result in a higher or lower score).

Thus, different terms are used as the researcher moves through conceptual, theoretical, and empirical stages. Occasionally, you will notice that the terms are used interchangeably. But, technically, as the terms move from concept through construct through variable to operationalization, a greater level of specificity should be given.

When you read scholarly journal articles using quantitative methods, you will read about concepts and constructs in the literature review. In this section, the researchers may even present conflicting definitions of the concept of interest. When researchers present their research questions and hypotheses, they will become more specific and treat the concepts and constructs as variables. In the methods section of the journal article, researchers will be precise and provide the operationalization—how the variable will be observed and measured—of each variable.

Both researchers and consumers of research benefit when there is specificity about what is being studied (Miller & Nicholson, 1976). If terms are defined explicitly in operationalizations, it is more difficult for the researcher to draw conclusions beyond the boundaries established. Another advantage is that findings of studies that use the same or similar operationalizations can be compared. When an operationalization is accepted as a standardized way of measuring or observing, there are two consequences. First, preciseness is achieved, which allows our understanding of the communication phenomenon to be enhanced, and this enhancement supports theory development. Second, operationalizations allow other researchers to replicate the research to verify or challenge findings.

MAKING THE CASE FOR QUANTITATIVE RESEARCH

For many of the other social sciences and for a long period of time in communication, researchers conducting their research from the social science perspective relied primarily on quantitative research methods. Traditionally, experimental forms were preferred to other methods in which variables are quantified (for example, surveys). Today, however, communication researchers choose from a variety of quantitative *and* qualitative methods. Which method should be chosen is one of the decisions the researcher must make. By answering the question "What do I want to know in this study?" clearly and completely, the researcher can select the appropriate methodology. Reviewing the advantages and limitations of quantitative research will help you determine what types of questions are best answered by quantitative methods.

Advantages of Quantitative Research

The advantages of using quantitative research methods are obvious. First, quantitative methods used in communication research follow the

TRY THIS!

Operationalizing Variables

Communication researchers are often interested in studying concepts that are abstract in nature. For example, to study how couples in love communicate and then compare that to how couples not in love communicate, we would first have to describe what love is and then operationalize it. Review the examples that follow; which operationalization do you like best? What is problematic with the two operationalizations? What operationalizations can you develop? Are there other descriptions of love more central to communication?

Description of Love	*Operationalization of Love*
When two people hold hands in front of others	The number of times a couple hold hands for longer than one minute in public
When two people tell their friends and relatives that they are in love	The degree of vocal intensity in telling friends and relatives that they love the other person; the number of reasons given when telling friends and family that they love the other person.
When two people independently feel attracted to each other and decide not to date others	
When two people in a committed relationship do unexpected tasks for each other	

tradition and history of quantitative methods in other disciplines. Thus, the use of quantitative methods implies a certain amount of rigor in the research process. By quantifying and measuring communication phenomena, communication researchers are using the same research language as researchers with whom they share interests. Sharing a research tradition could, for example, strengthen the relationship between communication researchers who study organizational communication and researchers from the management discipline. Likewise, many communication researchers who study interpersonal issues would share a research tradition with psychologists who focus on individuals and their relationships.

A second advantage of quantitative research comes from the use of numbers and statistics. By quantifying communication concepts and using statistical procedures for evaluating differences and relationships, researchers are able to be very precise and exact in their comparisons. This is especially important in the study of microelements of communication. Quantifying abstract concepts provides researchers a way to isolate variables and gain knowledge about concepts that would otherwise remain hidden.

Third, because we can quantify communication phenomena, we can make comparisons, and those comparisons can be made among a large group of participants. As a result, researchers can generalize their findings to other individuals who have the same characteristics as those in the research project.

Limitations of Quantitative Research

Of course, with advantages come limitations. And, as is often true, limitations stem from the same sources as the advantages. Because

quantitative research can focus on micro-elements of communication phenomena, this type of research generally does not lend itself to capturing the complexity or depth of communication over time. The restriction of focusing on just a few variables at a time makes it more difficult for researchers to examine the entirety of the communication process.

Likewise, quantitative research cannot capture communication phenomena that cannot be replicated or simulated in a controlled research environment. Although researchers can use quantitative methods in the field, all participants must be subjected to the same stimuli and systematic procedures. As a result, questions about a communication phenomenon that occurs spontaneously or sporadically are not as well suited to quantitative methods.

ISSUES OF RELIABILITY AND VALIDITY

All quantitative research hopes to be both reliable and valid. **Reliability** is achieved when researchers are consistent in their use of data collection procedures and when participants react similarly to them. Reliability also means that other researchers using the same measure in another project with comparable participants would get similar results (Hoover & Donovan, 1995).

But reliability is only part of evaluating a quantitative research method. **Validity** is achieved when the measurement does what it is intended to do (Hoover & Donovan, 1995). Validity is related to truth. Thus, within scientific reasoning, the better the technique is at uncovering the reality of the concept, the more valid it is. If a questionnaire presumably testing your degree of communication competence asks you to respond to an item about your ability to handle conflict, the item would be valid if you and other people in general believe that handling conflict effectively is, in fact, evidence of communication competence.

Reliability and validity are related. Both are evaluations of the utility of a measuring device. When reliability and validity are achieved, the data are free from systematic errors (Selltiz, Jahoda, Deutsch, & Cook, 1959). This is why quantitative researchers must carefully consider reliability and validity in the planning stages of their research project. But doing so is not enough. At the end of data collection, one of the first analytical steps quantitative researchers perform is to assess the reliability and validity of their data. Without reliable and valid measurement, the results of the study, which rely on how the data are collected, are suspect. More detailed information on how to assess reliability and validity can be found in Chapter 6.

Threats to Reliability and Validity

Any measuring device can be faulty—whether the device is a questionnaire or a researcher categorizing and counting the number of times you use "Ms. Wright" while talking to your boss. Communication research is especially vulnerable to threats to reliability and validity because it measures complex communication phenomena. Let's examine different types of threats to reliability and validity (Selltiz et al., 1959).

First, reliability and validity are threatened if the measuring device cannot make fine distinctions. To what degree can the measuring device capture specificity or exactness? In measuring a person's orientation, or relationship, to organizations, can the measure of organizational orientation (McCroskey, Richmond, Johnson, & Smith, 2004) really distinguish among individuals who have a strong affinity for organizations, those who do not care much about organizations, and those who cannot adapt to organizations well? Second, reliability and validity are threatened if the measuring device cannot capture how people differ. Not only must the organizational orientation measure make distinctions among the three different orientations a person can have to organizations, but it must also provide information about how individuals with those orientations communicate in organizations.

A third threat is present when researchers attempt to measure something that is irrelevant or unknown to the respondent. Anyone can respond to a questionnaire; but if the respondent does not understand the questions or if the respondent is asked to give responses for something for which he or she has no reference, then the measurement is faulty. This is especially true

of opinions and attitudes, which are often part of quantitative communication research. Simply, it would not make sense to ask an unmarried and never-married respondent to answer questions about communication satisfaction with a marital partner.

Finally, the complexity of human communication behavior can threaten reliability and validity. Can any measuring instrument really capture the phenomenon? For example, if two researchers are measuring the length of a building and they disagree, together they can remeasure the building. Their individual measures can be verified by each other or a third party. But how can someone verify your organizational orientation? Asking you to respond again to the questionnaire may produce different results, depending on the number and types of interactions you have had in organizations since you last answered the questionnaire or depending on a change in your motivation or employment status. Someone else cannot independently verify your organizational orientation—only you can provide that information. Moreover, what if your organizational orientation is not represented by the three orientations captured by this questionnaire?

As you can see, quantifying communication phenomena provides some difficulties and creates consequences for the validity and reliability of the research. Although researchers want to capture variation across the participants in the research project, the variation should be representative of the true differences among individuals and not result from measurement errors (Selltiz et al., 1959).

Besides the variation that researchers want to capture, there are many other possible sources of variation (Selltiz et al., 1959). Unless these variations are intended to be examined as part of the research design, when they are present, the following must be considered as threats to reliability and validity:

1. Variation due to factors not measured in the research study. For example, you want to measure effects of personality on conflict management strategy choice. A researcher would have to check the research literature to determine if personality is the best choice of independent variable. Rather than personality, could it be that our experiences with conflict help mold our preferences?

2. Variation or differences due to personal factors, such as mood, fatigue, health, time of day, and so on. How would these factors affect your choice of conflict management strategy?

3. Variation or differences due to situational factors. Would your choice of conflict management strategy be different at school, at work, at home?

4. Variation due to differences in how the research project is administered. Different researchers may use different communication styles in working with research participants. Would you respond differently to a researcher who appears to be bored than you would respond to a researcher who appears enthusiastic?

5. Variation due to the number of items included in the measuring device. Asking only one question about each of the conflict management styles would not be the same as asking several questions about each style. Multiple items are required to capture the breadth and complexity of most communication phenomena.

6. Variation due to unclear measuring device. As an assistant to a researcher, you are asked to observe students giving speeches and count the number of times students use incomplete sentences. In one speech, the speaker gives an incomplete sentence but before moving on to the next sentence catches the error and restates the incomplete sentence as a full one. Do you count this or not?

7. Variation affected by mechanical or procedural issues. In a research experiment, you are asked to recall your last conflict with your relational partner and write out what you said to him or her. As you recall the conflict incident, you recognize that the conflict was a lengthy one lasting for about 20 minutes. But the researcher left only 3 inches of space on the questionnaire for you to describe what you said. Not knowing what to do, you select the most important things you said and leave out the rest.

8. Variation due to the statistical processing of the data. For example, the researcher accidentally selects the wrong statistical test from the pull down menu. Or the person who enters your data in the computer pushes "4" every time you have responded with a "5."

Obviously, you want to capture and test variation in your research project. But this type of variation is planned for and identified in your hypotheses and research questions. Other variation is problematic. Look again at the model for quantitative research in Figure 3.1. Notice that selection of methods must be balanced with issues of reliability and validity. That is why researchers using quantitative methods must carefully consider and evaluate their research design, or their procedures and methods, before data are collected. Capturing variation beyond the variation the researchers want to capture is measurement error, which produces threats to reliability and validity.

SUMMARY

1. Quantitative research relies on the use of numbers as a way of observing and measuring communication phenomena.
2. Researchers bring objectivity to the study of communication through the use of traditional quantitative approaches and statistical techniques.
3. Quantitative research relies on deductive reasoning.
4. The primary objective of quantitative research is to test propositions developed from theory.
5. The quantitative research model includes five components: research purpose, literature foundation, research questions and research hypotheses, research methods, and validity and reliability.
6. Quantitative research requires that every phenomenon studied be conceptualized and then explicitly defined. Researchers work from concepts to constructs to variables to operationalizations in providing the degree of objective specificity needed to examine communication phenomena.
7. Operationalizations are the specific way in which researchers observe and measure variables in quantitative research.
8. Quantitative research typically relies on the use of hypotheses to drive the research process.
9. Hypotheses should be simply stated, have variables and their relationships clearly specified, and be testable.
10. Although researchers develop research hypotheses, the null hypothesis is actually the focus of the statistical test.
11. A hypothesis includes both independent and dependent variables.
12. Researchers can also use research questions as a foundation for their quantitative research. Research questions are appropriate to use when there is little known about a communication phenomenon or when previous results are inconclusive.
13. Advantages of quantitative research include a certain degree of rigor, objectivity achieved through the use of numbers and statistics, and ability to make comparisons among a large group of participants.
14. Limitations of quantitative research include difficulty in capturing the complexity or depth of communication over time, and the inability to capture communication phenomenon that cannot be replicated or simulated in a controlled environment.
15. Quantitative research must address threats to reliability and validity, including using imprecise measures of variables, attempting to measure something that is unknown or irrelevant to participants, and difficulty in capturing the complexity of human interaction.

KEY TERMS

antecedent variable
causal variable
concept
conceptual scheme
construct
criterion variable
dependent variable
directional hypothesis
experimental variable
independent variable
nondirectional hypothesis
null hypothesis
operationalization
outcome variable
predictor variable
reliability
treatment variable
validity
variable

See the website www.mhhe.com/keyton3 that accompanies this chapter. The site contains a chapter summary, outline, and checklist. A PowerPoint presentation created by Dr. Keyton is also available for download, as well as a short multiple-choice quiz to check your learning. You will also find a list of Internet resources that provide further information about the issues in this chapter.