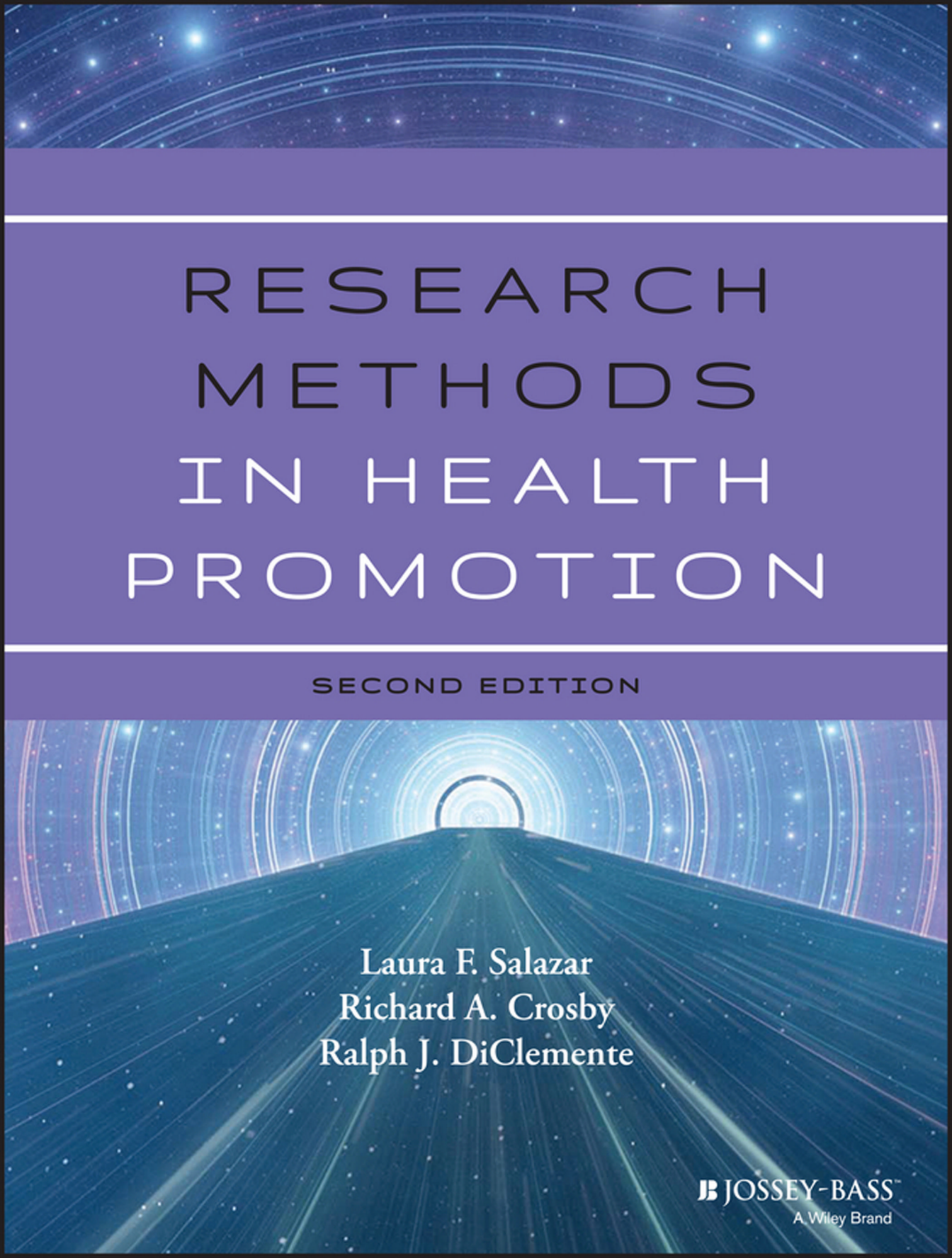
RESEARCH METHODS IN HEALTH PROMOTION
SECOND EDITION
Laura F. Salazar
Richard A. Crosby
Ralph J. DiClemente
JOSSEY-BASS
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RESEARCH METHODS IN HEALTH PROMOTION

Second Edition

Laura F. Salazar
Richard A. Crosby
Ralph J. DiClemente

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PREFACE

The authors of this textbook have been teaching graduate students about health behavior and health promotion research for over three decades. As successful researchers, we have a love for precision and rigor in the process of scientific inquiry. Our passion in the process of using science to promote health has been conveyed to our students through countless applied examples. We believe that even the most daunting concepts can be easily learned once students make a clear connection to these concepts' utility to promote health. We also maintain that the research process is an enjoyable sequence of decision-making challenges that compose a journey. It is this journey that often creates anxiety for novice researchers. Our mission in writing this book is to alleviate that anxiety by replacing it with competence and anticipation.

Nine years ago we wrote the first edition of *Research Methods in Health Promotion*, which was widely embraced across schools of public health throughout the United States. We are always gratified to meet students who have used our book and to hear how they have progressed in their level of expertise. As satisfying as it is to receive praise from students, after using our textbook for the past eight years we realized that that there were areas for improvement. As a consequence of our continued quest to demystify and illuminate research methods in health promotion, we are pleased to offer this expanded second edition. We have reorganized the book so that the first thirteen chapters are grouped into parts and form the core of the textbook: Foundations of Health Promotion Research (Chapters One through Three), Fundamentals of Health Promotion Research (Chapters Four through Eight), and Applications of Health Promotion Research (Chapter Nine through Thirteen). The fourth part focuses solely on Data Analysis and includes chapters for observational studies, experimental studies, and qualitative research. The final part is Core Skills, which provides how-to guidance on writing a journal article and writing a grant.

Chapter One still outlines the steps necessary in undertaking research in health promotion; however, we couch these steps in an analogy of "embarking on a road trip" so that new researchers can, from the beginning, feel a sense of excitement when embarking upon a research study. Chapter Two, a solid chapter on the philosophy of science, provides the Greek

and Latin origins of many of the terms we use in research and a basic foundation in science and the scientific method and highlights the different epistemologies often used to contribute to knowledge. Chapter Three has been rewritten and expanded to include more content specific to health promotion research, with less focus on the historical and federal legislation aspects of this topic and more focus on the practical approaches to preparing an IRB application. Chapter Four has been updated with new research examples—many of them global—and new figures that illustrate all of the designs, tables that describe strengths and weaknesses, and a focus on observational designs only. Chapter Five was spun off from the previous Chapter Four; this new chapter describes experimental and quasi-experimental designs. Similar to Chapter Four, Chapter Five includes global examples, new visuals depicting each of the designs, tables with strengths and weaknesses, and an expanded section on threats to internal validity. Chapter Six, on sampling, has been expanded to include two newer types of sampling methods used frequently in health promotion research: respondent-driven sampling and venue-day-time sampling. Chapter Seven, on measurement, is now more streamlined and integrates principles regarding the improved use of self-reported assessments (thereby allowing for one less chapter in this edition). Chapter Eight, on qualitative research strategies, excludes the former small section on data analysis but is expanded to include the different types of triangulation and more recent examples pulling from global health promotion. Chapter Nine begins the Applications part and provides the practical nuts and bolts of conducting observational research in the field, answering questions such as How do you gain access to a sample? and How do you recruit your sample? Chapter Ten is also a "how-to" chapter in that it provides step-by-step guidance on preparing and implementing a randomized controlled trial, a design used frequently to test health promotion interventions. Chapter Eleven, a new addition to our textbook, is dedicated entirely to methodologies that integrate community-based participatory research (CBPR) with traditional research methods. Chapter Twelve, on program evaluation, has been updated with recent examples, new visuals, and an expanded section on cost-benefit analysis. Chapter Thirteen, a new addition to the book, provides an overview of and guidance on planning and conducting large-scale survey research.

Chapters Fourteen and Fifteen, our data analysis chapters, have been updated with more recent and global examples but are still meant to provide knowledge on how to analyze the data rather than instruct on the mathematical equations or probability theory underlying statistics. Chapter Sixteen is a brand-new chapter that provides an overview of the data analytic process for qualitative research. This chapter, like the others in this textbook, is very readable, keeping the jargon to a minimum; it instructs

on interpretation and how to write-up qualitative results, with examples provided throughout. The final two chapters, Seventeen and Eighteen, focus, respectively, on the publication process, with tips for writing up your results, and on writing a successful grant application for funding—two very important aspects of being a successful health promotion researcher.

Other novel additions to this second edition include:

- A brief preview of each chapter at its outset, along with specific learning objectives
- The use of photos and other visuals to help convey the concepts more clearly
- An expanded range of case studies and vignette examples, many of which are global
- A greater use of examples that transcend the individual level of health promotion research and extend to structural levels of intervention
- Added examples that integrate health promotion with environmental health
- Four new chapters that provide a greater depth and breadth of information for students who are dedicated to a successful career in health promotion practice and research
- An expanded array of examples and options that optimize advances in technology as applied to health promotion research
- Key concepts bolded and defined within the text
- Discussion and "for practice" questions to stimulate thinking and encourage application of the concepts
- The return of Mincus and Dincus, our small furried friends, who try so hard to conduct their research in four new cartoons

An instructor's supplement is available at www.wiley.com/go/Salazar2e. Additional materials, such as videos, podcasts, and readings, can be found at www.josseybasspublichealth.com. Comments about this book are welcome; please send them to publichealth@wiley.com.

We invite you to use this second edition as a primary tool of your trade and to constantly challenge yourself to find creative ways to apply science to health promotion. As you learn the methods contained in this book, please bear in mind that the future of public health is in your hands.

ACKNOWLEDGMENTS

First and foremost, we would like to acknowledge our late editor and dear friend, Andy Pasternack. As an editor he was superb. As a friend he was without equal. This second edition would not have been possible if it weren't for him. Andy was a champion of our first edition textbook, and because of his encouragement, his tenacity, and his guidance, we have produced a second edition that we hope is up to his high standards and worthy of his praise. We would also like to acknowledge each of our contributors, who took time out of their very busy schedules and put forth great effort and careful thought to their respective chapters. Furthermore, we extend our thanks to Ellie Faustino for her superb editorial wizardry, which ensured that our written words were free of non sequitur and that we avoided any grammatical faux pas; to Rachael Wendlandt, our research assistant, for her dedication in helping us find recent, relevant, and global studies to include as examples; to Monique Carry, a qualitative guru and supreme expert, for her feedback and comments on our qualitative chapters; and to Justin Wagner, once again, for his amazing original artwork and a slightly newer conceptualization of our beloved Mincus and Dincus. We want to thank the anonymous reviewers who provided wonderful feedback and helped further improve this textbook.

Also, we wish to acknowledge our new Jossey-Bass editor, Seth Schwartz, who has been very supportive and seamlessly took over to help produce this volume. He has been understanding of our needs, forgiving of deadlines, and helpful in ways too numerous to enumerate. Melinda Noack of Jossey-Bass has also been a delight to work with, as she systematically and patiently helped us wade through a voluminous number of images, permissions, and tasks. Finally, we wish to acknowledge the future, current, and retired public health researchers and practitioners for the work they have done and for the work they continue to do to improve the public's health.

We would like to thank proposal reviewers Christian Grov, Eric Jefferis, Sherryl Johnson, Ryan J. Martin, Kay Perrin, Diana Silver, and Leslie Spencer, who all provided valuable feedback on the original book proposal. Randy L. Byington, Sachiko Komagata, and Sheryl Strasser provided thoughtful and constructive comments on the complete draft manuscript.

To the stars in my universe—my children, Nicholas, Zachary, and Francesca, and my dear husband, Chuck—who are always there for me and provide much-needed perspective.

—L.F.S.

• • •

To my former students, throughout the United States and the world, who have helped shape the way this book teaches future generations of students, who will promote health and prevent disease.

—R.A.C.

• • •

To the three women in my life—Gina Maria, Sahara Rae, and Sianna Rose—who are my soul, inspiration, and motivation.

—R.J.D.

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Ralph J. DiClemente is Charles Howard Candler Professor of Public Health and associate director, Emory Center for AIDS Research. He holds

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Dr. DiClemente's research interests include developing decision-making models of adolescents' risk and protective behaviors. He has a particular interest in the development and evaluation of theory-driven HIV/STD-prevention programs for adolescents and young adult women. He has published over 500 peer-reviewed articles in medical, public health, and social and behavioral science journals, over 150 book chapters, and 18 books. He currently teaches a course on grant writing and research ethics and serves on numerous editorial boards and national prevention organizations, such as the Office of AIDS Research Advisory Council.

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• • •

Even the best textbooks benefit from the wide classroom testing of their first edition, especially in a field as fast developing, technologically wired, and interdisciplinary as health promotion, and as politically central as health promotion is to the social and economic development of health. The editors and chapter authors of this book have taken much comfort and guidance from the reception and the experience of instructors, students, and practitioners to their first edition. This second edition will be welcomed.

FOREWORD

Much of the published writing on research methods misses the mark for students of the health professions because academic authors tend to emphasize research methods that will meet scientific needs rather than practitioner or population health needs. They often start with theory or research questions from more basic disciplines and ask what opportunities or challenges clinical, school, or community health situations offer to test those theories. It seems too often that preprofessional students are being trained to turn their practices into community laboratories to serve the cause of science and theory testing, rather than using science and theory to solve population health needs or their problems in practice. The editors of this volume have challenged their contributing authors (and themselves, with the many chapters they have written) to show how their research methods can answer the questions that practitioners are asking. They acknowledge the growing demand for evidence-based practice and theory-based practice, but they demonstrate that these will come most effectively when we have more practice-based evidence and practice-based theory.

Rather than starting with theories and asking what practice situations can offer to test them, practice-based research starts with problems in practice and asks what research and theory can offer to solve them. It is that twist that sets this book apart from the usual emphasis of research methods textbooks used in professional preparation programs.

The other distinction between this book and many of the research methods books used in health professional training is the emphasis in this book on social and behavioral change as the intervening and dependent variables. Too often, the only texts required of students pursuing health promotion in health professional schools have been on epidemiological and biostatistical methods. In those, the complexities of social and behavioral determinants tend to be minimized in favor of the long and deep traditions of change in communicable diseases associated with the physical environment and biological processes of threats to health. Designing research and evaluation in which social and behavioral processes are the dominant determinants of today's chronic diseases has produced a range of innovations and shifts in emphases within the repertoire of research designs and methods. This book seeks to reflect those.

The chapters of this book offer applied examples from health promotion that illustrate the key concepts or research methods presented in each chapter. The chapters present a series of pros and cons for the methods presented as well as case studies that challenge readers to apply what they have learned. Another added value of this book, as distinct from the numerous textbooks available on research methods for each of the cognate disciplines (for example, epidemiology, psychology, sociology, anthropology, political science, economics) underpinning health promotion practice, is that this book seeks the multidisciplinary blending of methods necessary to understand, predict, and address the several ecological levels at which causation happens and change must occur. Any of the excellent research methods books from other disciplines deal with only a relatively narrow slice of the multilayered reality that health promotion must address. Research methods in health promotion must blend approaches from psychology and sociology, for example, to encompass the ecological reality of reciprocal determinism between individual behavior and environment. Health promotion research must also accommodate anthropological and economic methods to probe the culture differences that account for many of the problems of inequity and underserved populations.

Notwithstanding the differences and complexities of mixed methods and multiple levels of analysis, the authors have strived to give cohesiveness to varied research methods by maintaining a consistent theme that "research involves a predetermined series of well-defined steps." They revisit these steps throughout in a common sequential format. They seek to present a cohesive understanding of the role of science in public health and, more specifically, in health promotion. Even as they are ecumenical in their admission of the methods from various disciplines, they are also critical in evaluating their use and their limitations in health promotion research, and the ethical issues and problems of external validity surrounding some methods of experimental design, sampling, and randomization in the health promotion context.

The authors of this book have drawn on both their considerable academic experience in teaching students of health promotion and their field experience in practice-based research in HIV/AIDS, school health, reducing health disparities, and numerous other areas of public health, to represent the research methods most relevant and specific to the work ahead for students in health promotion.

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PART ONE

FOUNDATIONS OF HEALTH PROMOTION RESEARCH

CHAPTER 1

KEY STEPS IN THE RESEARCH PROCESS

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Health promotion has become a cornerstone of efforts designed to prevent morbidity and premature mortality (Smedley and Syme, 2000). Indeed, many nations have embraced health promotion as an approach to enriching and extending the lives of their people. Core tasks of health promotion include the primary and secondary prevention of disease and health-compromising conditions. These tasks are reflected in two overarching goals established by the United States Department of Health and Human Services: to "increase the quality and years of healthy life" and to "eliminate health disparities" (Department of Health and Human Services, 2010). Of course, the broad scope of these tasks presents an enormous challenge to the discipline of health promotion. This challenge demands that the efforts and resources of health promotion practitioners be firmly grounded in the context of research findings.

To begin, it is important to state that health promotion research is the harbinger of effective health promotion practice. Accordingly, a great deal of time and attention should be devoted to research agendas before health promotion programs are designed and widely implemented. Moreover, successful research endeavors must ensure rigor, which is the hallmark of scientific inquiry. Rigor is properly thought of as a quantity—it exists (or fails to exist) in varying degrees. Although no study can be "perfect" in rigor, studies can have a high degree of rigor. As rigor increases, confidence in the findings also increases.

LEARNING OBJECTIVES

- Understand how the health promotion discipline constitutes a paradigm shift in terms of its emphasis on preventing disease.
- Understand the nine-step model and be able to apply this to your own research project.
- Understand the importance of rigor in health promotion research and how to achieve greater rigor.
- Consider issues in scholarship, grantsmanship, and ethics that are part of the research process.

Therefore rigorous studies have great potential to shape health promotion practice.

Although this book focuses on the application of research methods to health promotion, there are at least two frameworks that address the broader set of issues relevant to the conceptualization, design, implementation, and evaluation of programs. In particular, one framework, the RE-AIM model (Glasgow, Vogt, and Boles, 1999) can be used as both a design and an evaluation tool for health promotion planning. The acronym stands for five stages. The first is Reach, which represents the level of spread or diffusion of a health promotion program within a given population. The second is Effectiveness, which represents the utility of the program to make a difference when used in ordinary circumstances. The third is Adoption, which is the uptake of the program by health promotion professionals. The fourth is Implementation, which describes the fidelity of program use among those adopting it. The final stage is Maintenance, which represents the ongoing and correct use of the program such that substantial changes to morbidity and mortality can occur.

The second framework, the PRECEDE-PROCEED model (Green and Kreuter, 2005), is a comprehensive model for organizing the health promotion planning process from its inception to its widespread implementation and ongoing evaluation. This planning model is one that should be firmly understood by anyone engaged in health promotion and, by extension, anyone engaged in health promotion research. The two models are depicted in Figures 1.1 and 1.2, which provide overviews of their logic and utility for health promotion.

Without question, the rewards of health promotion research are the excitement generated by evidence-based conclusions along with the associated implications for widespread implementation and ultimately the effects on public health. We may think of health promotion research as a journey down the research highway that reveals insights into human behavior pertaining to health and wellness. This exploration into people's lives should never be taken for granted; indeed, the opportunity provides health promotion practitioners a partial blueprint for the design, implementation, and justification of behavioral and structural interventions.

As with any journey, however, there are many decisions to make and myriad options from which to choose. Each leg of this research journey will have consequences (both good and bad) and, depending on the path taken, may result in reaching a crossroads or even a dead end, so it is important to consider each decision point and plan your journey carefully. Because you may not have been on this type of journey before, you won't be expected to travel alone. We will be your tour guide for this journey, walking you through the research process, helping to identify salient points of interest, and warning you of any potential dangers.

RE-AIM (Reach, Efficacy/Effectiveness, Adoption, Implementation, and Maintenance)

Brief Description:

RE-AIM is a conceptual model to help identify key factors to implementation. It is a systematic way for evaluating public health interventions that assesses five dimensions: Reach, Efficacy/Effectiveness, Adoption, Implementation, and Maintenance.

Reach is the absolute number, proportion, and representativeness of individuals who participate in a given program.

Efficacy/Effectiveness is the impact of an intervention on important outcomes. This includes potential negative effects, quality of life, and costs.

Adoption is the absolute number, proportion, and representativeness of settings and staff who are willing to offer a program.

Implementation, at the setting level, refers to how closely staff members follow the program that the developers provide. This includes consistency of delivery as intended and the time and cost of the program.

Maintenance is the extent to which a program or policy becomes part of the routine organizational practices and policies. Within the RE-AIM framework, maintenance also applies at the individual level.

Figure 1.1 The RE-AIM Model

In this journey, the mode of transportation will be the methodological *paradigm* applied to your research. From the Greek word *paradeigma,* **paradigm** literally means model, pattern, or example; however, this rather simple definition can be expanded to encompass a "worldview" that may be influential in shaping the development of a discipline. A methodological paradigm is a discipline's view of which research techniques and practices are promoted and should be practiced. A discipline's methodological paradigm has strong implications for how the discipline as a whole will progress. Thomas Kuhn, a twentieth-century professor in philosophy and the history of science, is credited with popularizing the term *paradigm*. He wrote a provocative book, *The Structure of Scientific Revolutions,* in which he describes the history of science as being composed of "a series of peaceful interludes punctuated by intellectually violent revolutions" (Kuhn, 1970, p. 10), which can change profoundly the existing worldview and result in a paradigm shift. He articulated the importance of paradigms in shaping and guiding a scientific discipline:

paradigm
a way of viewing the world around you; this includes the way in which disciplines conduct research

> A shared commitment to a paradigm ensures that its practitioners engage in the paradigmatic observations that its own paradigm can do most to explain. Paradigms help scientific communities to bind their discipline, in that they help the scientist create avenues of inquiry, formulate questions, select methods with which to examine questions, define areas of relevance, and establish or create meaning. A paradigm is essential to scientific inquiry [Kuhn, 1970, p. 142].

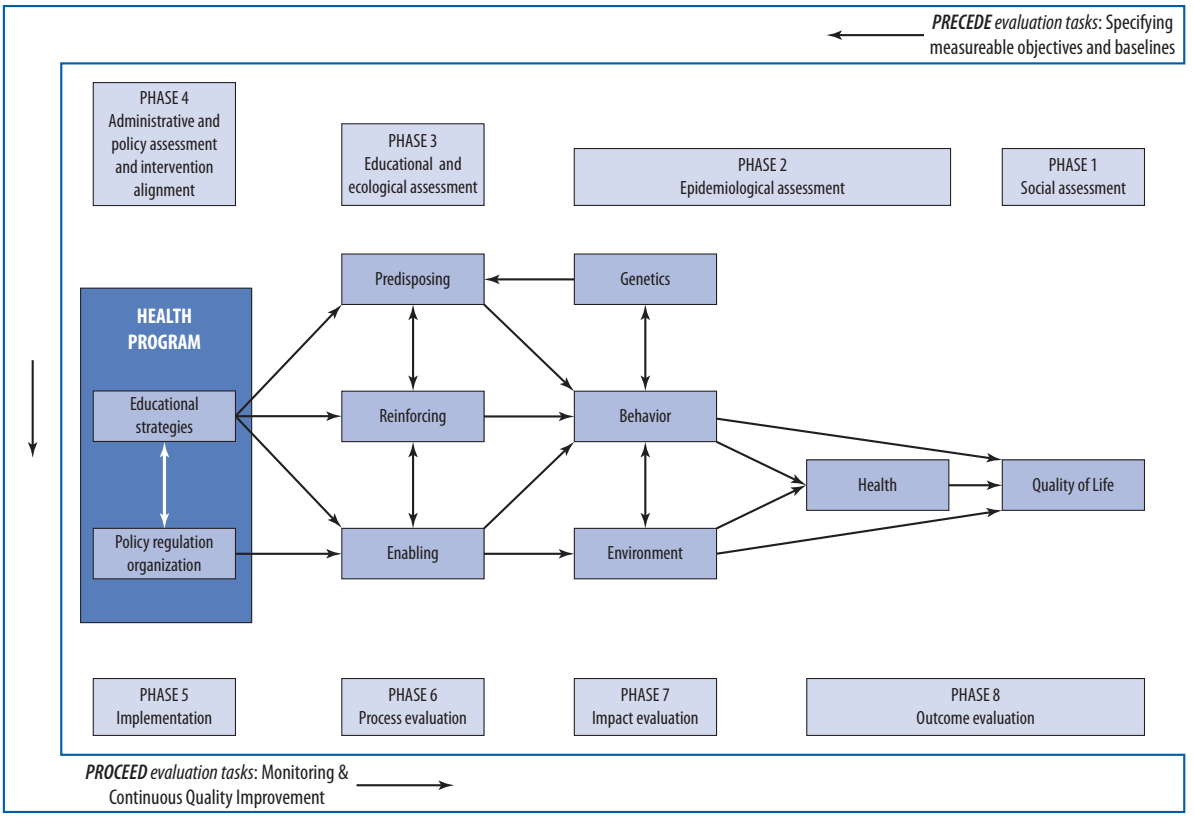

Figure 1.2 The PRECEDE-PROCEED Model

Source: Green & Kreuter (2005), with permission.

The establishment of health promotion as a discipline can be viewed as a paradigm shift in that health promotion researchers and practitioners place an emphasis on improving health and well-being and preventing disease, where previously the focus had been on treating disease. To truly have an impact on the health of the public, prevention requires a body of knowledge generated by rigorous research to help inform its efforts. As was ancient Rome, rigor is built "one brick at a time." Fortunately, clear blueprints exist for building rigorous studies. In fact, successful research can be characterized by a series of well-defined steps, all of which are essential. Following the steps sequentially is equally important. In this chapter, we provide an overview of the research process (the "journey") beginning with discovery of the idea; we then illustrate each of the essential and sequential steps in detail. We also emphasize the importance of the context in which the research process takes place. The result should be a keen understanding of the research process so that your journey will be a successful one.

Discovery

The research process in health promotion can be viewed as a process of discovering new ideas that can ultimately help improve the health and well-being of the public. This process of discovery is an **iterative process**, which means that each time a research question is addressed successfully, several new questions emerge. The diversity of potential research questions in any one aspect of health promotion creates an unending challenge (see Chapter Four for more detail regarding potential research purposes and questions). Research questions may appear quite humble yet demand rather complex and intense investigation efforts. Consider, for example, a question as simple as determining why people consume large amounts of saturated fats despite widespread awareness that these fats cause heart disease. An investigator could pursue cognitive reasons (for example, "those foods taste really good" or "those foods are satisfying"), social reasons (such as "most party foods are not healthy, but having fun is more important"), cultural reasons (for instance, "those foods are a tradition in our house"), or economic reasons ("fatty foods are usually more filling and less expensive than healthy foods"). An investigator could also approach the question based on perceived vulnerability of the study participants to the multiple forms of disease associated with a diet high in saturated fats (such as heart disease, stroke, obesity, and some forms of cancer). Obviously, then, the seemingly humble research question is actually an entire research career. In fact, successful researchers typically devote themselves to only one or two areas of inquiry. This focus enables them to use the findings from one study as a platform to formulate subsequent research questions for the next study, and so on.

iterative process one in which a cycle of discovery and revision occurs several times

Mincus "Discovers" His Research Idea

In addition to being a discovery process, health promotion research is also a public venture. Conclusions from health promotion research often have a direct impact on public health. For example, health promotion studies have shown that raising taxes on alcohol and cigarettes reduces consumption, which has led many states to adopt raising taxes as a form of public health intervention. Other studies have identified the individual and social determinants that contribute to vaccine acceptance (for example, flu, human papilloma virus), leading public health efforts to focus on reducing barriers such as cost or inconvenience to increase uptake of vaccines. Further, evidence suggests that people in malaria-affected countries are more likely to use bed nets if social marketing programs work to influence perceived risk and change cultural norms. As a public venture, then, discovery through health promotion research makes indispensable contributions to maintaining

IN A NUTSHELL

As a public venture, then, discovery through health promotion research makes indispensable contributions to maintaining the health and well-being of society.

the health and well-being of society. In the following section, we illustrate this discovery process using tobacco use as the public health issue.

VIGNETTE: PREVENTING TOBACCO DEPENDENCE

Globally, the use of tobacco is a behavior that leads to multiple forms of **morbidity** (incidence of disease in a given population) and premature **mortality** (incidence of death due to a particular disease in a given population). Thus health promotion programs designed to prevent tobacco dependence among young people are strongly warranted. A substantial number of these programs seek to prevent youths from initial experimentation with tobacco. These approaches certainly have value; however, research suggests that among young people tobacco dependency may be an extended process, which may be amenable to intervention even after their initial use of the substance. Imagine, then, that you have been asked to determine the effectiveness (that is, the capacity to produce the desired effect) of providing structural interventions to youths who have recently begun to use tobacco but have yet to develop a physical dependence. A **structural intervention** is one that alters environmental factors such as policies and laws regulating tobacco rather than trying to alter individuals' knowledge, attitudes, and beliefs with a small group intervention. Ultimately both methods should shape tobacco use behavior, but they differ in their approach.

morbidity
the incidence of disease in a given population

mortality
the incidence of death in a given population

structural intervention
one that alters the environment to foster improved health

The Nine-Step Model or "A Journey Down the Research Highway"

The research process can easily become unwieldy. Even seemingly simple research questions may lead an investigator to wonder if he or she is on the right track with regard to the process. The process is very much analogous to a long road trip—one that can start out with a straightforward path (see Figure 1.3) but later may take some turns or detours and be fraught with danger, but nonetheless reach a desired destination. To streamline the thinking and actions involved in rigorous research, we have created a nine-step model.

Figure 1.3 Road Image