CHAPTER ONE

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, 2000). 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 must be firmly grounded in the context of research findings.

To begin, then, it is important to state that health promotion research is the harbinger of effective health promotion practice. Thus, a great deal of time and attention should be devoted to research agendas before health promotion programs are designed and widely implemented. In turn, successful research endeavors must ensure rigor. Rigor may best be viewed as the hallmark of science.

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. 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 a number of other issues relevant to the conceptualization, design, implementation, evaluation of programs. In particular, an emerging framework, RE-AIM (Glasgow, Vogt, and Boles, 1999) can be used as both a design and an evaluation tool for health promotion planning. Also, the PRECEDE-PROCEED Model (Green and Kreuter, 2005) is a comprehensive framework for organizing the health promotion planning process from its inception to its widespread implementation and ongoing evaluation.

Illustration of Key Concepts

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. Although some of these steps may appear tedious, they are all essential. Following the steps sequentially is equally important. In this chapter we provide an overview of the process and then illustrate each of the essential and sequential steps in detail.

Discovery

Without question, one of greatest rewards of health promotion research is the excitement generated by evidence-based conclusions. Health promotion research is a process that reveals insights into human behavior as it pertains 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.

The process of discovery in health promotion research is iterative. 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 can be 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 (for example, "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.

MINCUS "DISCOVERS" HIS RESEARCH IDEA.

Because health promotion research is a discovery process it is also a public venture. Conclusions from health promotion research often have a direct impact on public health (for example, "evidence suggests that people who wear sunscreen are less likely to develop skin cancers") or an indirect impact on public health through changes in health promotion practice and policy (for example, the practice of providing same-day results for HIV testing is based on empirical findings that indicated low return rates for people testing positive). As a public venture, then, discovery through health promotion research is an indispensable contribution to maintaining the health and well-being of society. In the next section, we illustrate the discovery process using tobacco as the public health issue.

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In a Nutshell

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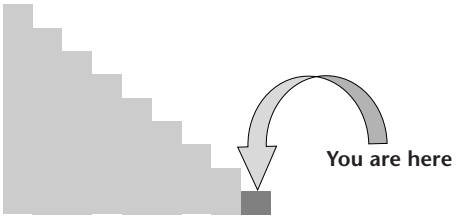
Vignette: Preventing Tobacco Dependence

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 *efficacy* (that is, the ability to produce the desired effect) of providing behavioral interventions to youths who have recently begun to use tobacco, but have yet to develop a physical dependence.

A Nine-Step Model

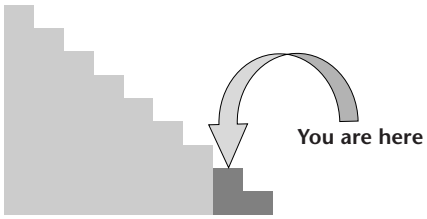
The research process can easily become unwieldy. Even seemingly simple research questions may lead an investigator to wonder if he or she is "on the right track"

with regard to the process. To streamline the thinking and actions involved in rigorous research, we have created a nine-step model that may be helpful.



Step 1: Defining the Research Population. Given that the elimination of health disparities is a priority, health promotion research typically seeks solutions to problems that disproportionately exist among members of a defined population. Because *population* is a broad term and can be defined in many different ways, it is up to the researcher to specify the parameters that will describe the target population. For example, the researcher may define the population as "low-income youths, thirteen to nineteen years of age, residing in rural, tobacco-producing states."

Moreover, the process of defining the target population is far from arbitrary. Ideally, selecting the target population should be based on known *epidemiology* (the scientific discipline studying the distribution of disease in human populations) of the disease or health risk behavior under consideration. Generally speaking, health promotion programs should be delivered to epidemiologically defined populations on a prioritized basis (in other words, those with the greatest degree of burden—often expressed as the rate of disease per 100,000 people—are served first).



Step 2: Defining the Research Goal and Specifying the Exact Research Questions. This second step is a turning point for the remainder of the research process. As a rule, narrow and precisely defined goals and questions are far more amenable to rigorous research designs than broadly defined goals and questions. At times, new researchers propose goals and questions that are far too broad to be addressed with ample rigor. An effective strategy to avoid this pitfall is to thoroughly review the recent and relevant empirical literature. This can be a

time-consuming process, but is nonetheless time well spent. Engaging in this process will inevitably yield a clear picture of gaps in the existing research. For new investigators, these gaps represent an opportunity to build on and extend the research literature, and should be a logical focus of their subsequent research.

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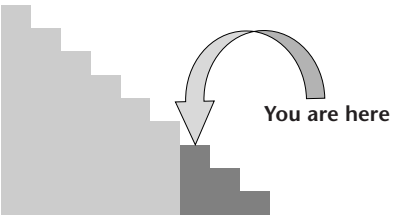
Although conventional standards do not exist, from a practical standpoint many researchers restrict their review of the literature to the past five years. On-line search engines such as Medline® and PsychInfo® are invaluable assets to the review process. A thorough review should include articles directly related to the topic and those that are related tangentially. Articles directly related, for example, could include those that report findings from research designed to prevent tobacco dependence in new smokers. Indirectly related articles could include those involving different populations (for instance, middle-class urban high school students) and address broader issues such as use of other substances like alcohol or marijuana. When interpreting your review, it is important to assign a higher priority to directly related articles, whereas articles that are indirectly related should be applied judiciously.

Once the literature review is complete, a research goal can be formulated. The research goal is a general statement that conveys the purpose of the planned study. The following statement, "to determine the efficacy of providing behavioral interventions for youths who have recently begun to use tobacco" is the research goal as stated in the vignette. The goal provides an overview of purpose and scope, but it lacks precision and specificity. Rather, it is the research questions that provide the precision and specificity. Research questions are based on the research goal. In the given vignette, samples of a few appropriate research questions may be as follows.

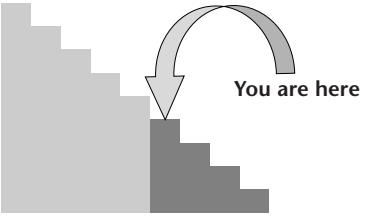
- Will a twelve-hour small-group intervention promote tobacco cessation among a greater percentage of youths than a brief version (six hours) of the same program?
- Will a twelve-hour small-group intervention promote tobacco cessation among a greater percentage of youths as compared to youths who receive no program at all?
- Will a six-hour small-group intervention promote tobacco cessation among a greater percent of youths as compared to youths who receive no program at all?

Please notice that each question is a derivative of the overarching research goal. Thus, each research question should provide information that serves the research goal. This derivative approach to research questions ensures that research efforts are accurately directed. Research questions should be centered upon a common purpose: the research goal. This practice sets the stage for the next step.



Step 3: Determining Whether the Research Should Be Observational or Experimental. Briefly stated, *observational research* refers to research in which variables are observed as they exist in nature—no manipulation of variables occurs. Observational research asks questions pertaining to "why people do what they do." This form of research *does not involve* treatment or intervention.

Experimental research, however, *does involve* manipulation of a variable (this could include education, policy changes, or changes in the environment). Thus, it builds upon observational research by asking, "How can we help people achieve positive change?" Experimental research is always concerned with the essential question of whether a given intervention program can produce outcomes of statistical significance and, more important, practical significance.



Step 4: Selecting a Research Design That Provides a Rigorous Test of the Research Questions. The choice of research designs ranges from simple observational studies (requiring relatively little time and generally manageable resources) to complex experimental studies (requiring several years to complete and the use of extensive resources).

The guiding principle in making the selection is parsimony. Parsimony implies that the need (that is, investigating the research questions) is met by a tool (that is, research design) that does the job well, without going beyond that which is necessary.

FIGURE 1.1. A TRAJECTORY OF RESEARCH IN HEALTH PROMOTION.

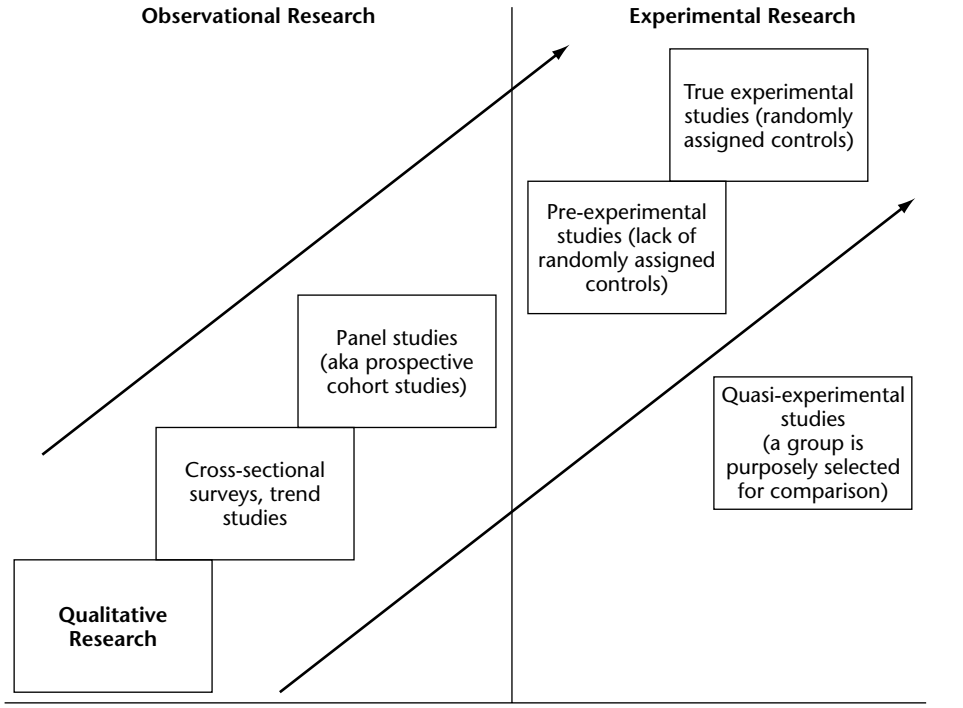


Figure 1.1 shows a trajectory of research designs that accommodate various forms of health promotion research. These designs are described in greater detail in Chapter Four. At the left and lower end of this trajectory, relatively simple research designs can be identified. Examples include qualitative studies and cross-sectional studies. As the level of complexity increases, the trajectory includes designs that necessitate the maintenance of a *cohort* (a cohort being a sample of research participants) over multiple assessment periods. A *cohort study* is synonymous with the terms *panel study, longitudinal study,* or *prospective study* and is located mid-level along the trajectory. Similarly, various levels of complexity exist among experimental designs, which are located toward the upper right end of the trajectory. The phrase "randomized, controlled, trial (RCT)" denotes a true experimental design located at the peak of the trajectory. Figure 1.1 also shows that quasi-experimental designs are located further along on the trajectory, but do not achieve the same "gold standard" status as the true experimental designs.

Quasi-experimental designs, however, are often necessary in health promotion, as certain intervention programs or structural-level interventions limit the ability to randomize (Murray, 1998).

As a rule, research should be constructed with designs that approximate the trajectory shown in Figure 1.1. That is, designs located to the left end of the trajectory serve as the building blocks for subsequent research questions that can then be addressed by progressively more complex designs.

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In a Nutshell

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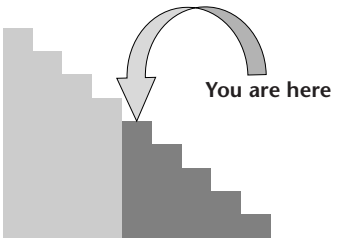


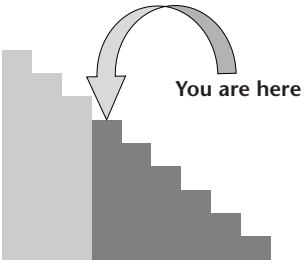
Step 5: Determining the Variables That Must Be Measured. First and foremost, the immediate goal is to be absolutely sure that every *variable* required for a rigorous study is identified. A variable is anything that changes, meaning it must assume a range of values. The research question and the literature review will inform variable selection. For example, suppose that the literature review indicated that efficacy of other tobacco-dependence programs was a function of participants' family environment (in other words, programs may work better for youths with a supportive family). Given even a remote chance that this same dynamic may operate in our hypothetical planned study of low-income youths residing in rural areas, it is incumbent upon the researchers to measure participants' perceived level of family support in addition to other critical variables.

The way in which the variables are measured is equally important. Indeed, rigor is dependent upon the selection of reliable and valid measurement instruments. Like research, measurement is a process. It involves identifying appropriate measures, or adapting existing measures to your unique research question,

or creating new measures. Chapter Nine provides details about measurement issues in health promotion research.

Some variables may be measured directly using a physical instrument (for example, a sphygmomanometer for blood pressure, or a scale for weight), whereas other variables such as level of skill applying a condom to a penile model can be measured directly through observation. In health promotion research most variables are measured indirectly using participants' self-reports (See Chapter Ten for more detail regarding the use of self-report measures). In this case, a mode of administration (for example, paper and pencil, face-to-face interview, or computer-assisted self-interview) must be selected based upon previous knowledge of the research population and the nature of the previously identified research questions.

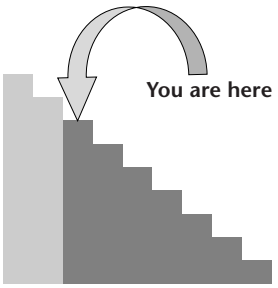
The process concludes with pilot testing designed to ensure that measures are appropriate for the planned study population. The pilot test also allows researchers to evaluate the psychometric properties of the self-report measures that purport to represent a *construct*. Constructs are defined concepts that would otherwise be considered abstractions. Examples of constructs used in health promotion research include self-esteem, depression, and self-efficacy.



Step 6: Selecting the Sampling Procedure. As in other aspects of the research enterprise, there are numerous sampling procedures that can be used in health promotion research. Sampling exists across a continuum of complexity and rigor. The sampling procedure employed is one of the most critical determinants of *external validity. External validity* refers to the ability to generalize study findings to the population of individuals with similar characteristics represented in the study sample. It should be noted, however, that not all research studies need to use a sampling procedure that yields high external validity.

Sampling should also include specifying the number of study participants. This number is selected based on a *power analysis.* Stated simply, a power analysis is the estimated ability of a statistical test to find true differences between variables or between groups of study participants. Although a study's power is determined

by multiple factors, sample size is one of the most important determinants. Planned sample sizes that provide inadequate power are crippling to the overall study. In the vignette, for example, a power analysis may suggest that each of the three study conditions should have one hundred participants. Having fewer participants in each condition could severely jeopardize the power of the study. More detailed descriptions of sampling procedures are presented in Chapter Eleven.

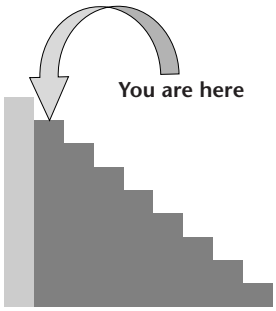


Step 7: Implementing the Research Plan. A basic requirement of *internal validity* is consistency in the implementation of all study protocols. *Internal validity* implies that the study is not confounded by design, measurement, or poor implementation of study procedures. Protocols spell out key procedures such as the sampling procedure to be used, how participants will be assigned to intervention conditions, when and where assessments will occur, who will provide the assessments, what participants will be told or not told about the research study, and how reticent participants will be enticed to return for follow-up programs or assessments. Because protocols are generally quite detailed, subtle departures from these detailed plans can be a common problem. Over time, however, this "drift" can amount to substantial changes in the way late-entry participants are treated as compared with those enrolling earlier in the study.

As an example of drift, consider the study of preventing tobacco dependence outlined in this chapter. The protocol specifies that teens will be "randomly assigned to either (1) the twelve-hour condition, (2) the six-hour condition, or (3) the no-treatment condition. Furthermore, assume that the protocol states that, "random assignment will be achieved by drawing colored marbles from an opaque container. Blue marbles signify assignment to the twelve-hour group, green marbles signify assignment to the six-hour group, and yellow marbles signify assignment to the no-treatment group. One hundred blue, one hundred green, and one hundred yellow marbles are placed in the container as the study begins. A dedicated research assistant has been charged with the implementation of this procedure.

In the first three months of the study, the research assistant performs flawlessly. Subsequently, however, the assistant learns that teens are benefiting from the twelve-hour and six-hour conditions. This perception leads the assistant to invite some teens (those who blindly pulled a yellow marble) to return the marble and "draw again." Repeated over time, this drift can create a systematic bias with respect to the composition of teens assigned to the three conditions.

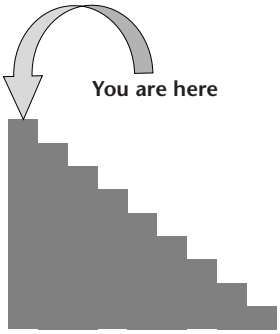
Other common forms of drift include departure from the planned intervention (perhaps the health educator for the six-hour program develops an "improved" method), deviations in how assessments are administered (perhaps research assistants change the way they perform interviews), and departure from sampling protocols. Fortunately, drift can be averted by vigilant attention to an established set of quality-assurance procedures. Ultimately, then, the principle investigator is the one person who must be accountable for implementing these procedures, thereby ensuring that drift does not occur.



Step 8: Analyzing the Data. Once all the assessments have been conducted, a data set can be established. The data set consists of the variables measured for each participant. The data set is, of course, quite valuable, as it can subsequently be used to answer the research questions that were formulated in step 2. After the data are checked for logical inconsistencies (called "cleaning"), the research process becomes dependent on the statistical skills of the research team. Again, parsimony is important at this step—the goal is *not* to perform a sophisticated analysis; instead, the goal is to perform an analysis that provides a rigorous and fair test of the research questions while avoiding the introduction of artificially imposed procedures.

In the tobacco-dependence vignette, a parsimonious analysis would be to simply compare the mean number of cigarettes smoked in the past week in each group, assessed at a designated point in time after the interventions have been completed. Suppose the means are (1) 8.3 for the twelve-hour condition, (2) 12.1 for the six-hour condition, and (3) 17.2 for the no-treatment condition. The means

can be compared using a very simple test (a one-way analysis of variance), which answers an essential question: Are the differences between means a function of the interventions or are they a function of chance? Analyses, however, can become quite complex when considering logically occurring questions such as: (1) Do intervention effects differ based on gender of the participant? (2) Do effects differ based on age of the participant? (3) Do effects differ based on the baseline assessment of tobacco use? Of course, these questions are vitally important, and each takes the analysis a necessary step farther away from simply comparing means. Chapters Twelve and Thirteen provide a more detailed discussion of data analysis.



Step 9: Disseminating the Findings. Rigorous research clearly warrants widespread dissemination. Indeed, this step elevates the project from a work in progress to science. Like each of the previous eight steps shown in this chapter, step 9 is also a process unto itself. The rudimentary starting point in this process is transforming the analytic results (numbers) into carefully articulated findings.

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In a Nutshell

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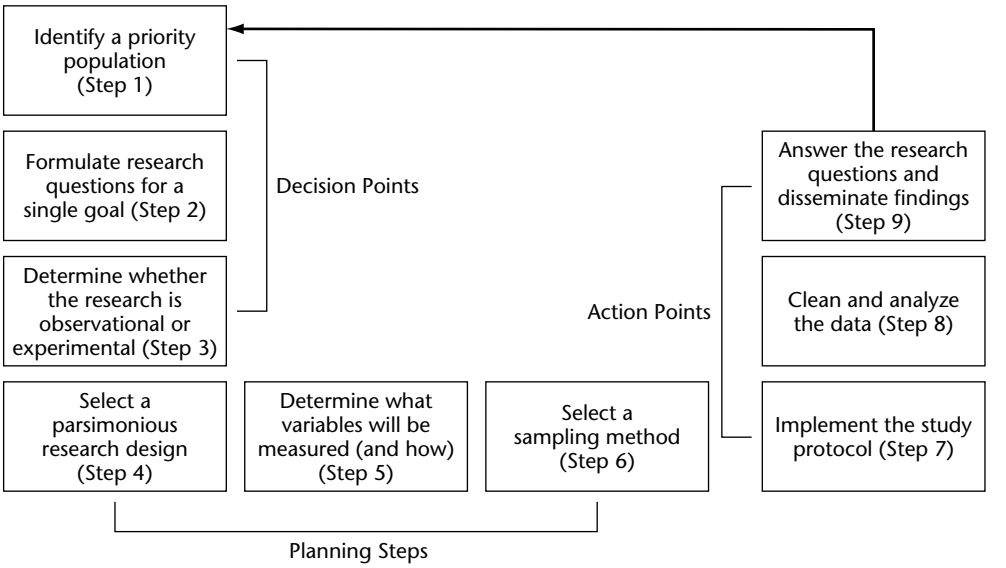
Findings are answers to the research questions that are generated by the data analysis. Next, the findings must be considered within the context of related research by showing how they strengthen or extend previous work. At this juncture, it is important to know that nonsignificant findings can be just as important

FIGURE 1.2. SCHEMATIC ILLUSTRATION OF THE NINE-STEP RESEARCH PROCESS.



as significant findings with respect to building the research base. The caveat to this statement, however, is that the study should have a high degree of rigor.

Moreover, the findings may raise additional questions that bring the research process back to its origin. Figure 1.2 illustrates this point. Inspection of the figure shows that research is an iterative process. Every time a research question is asked and answered another question (or set of questions) becomes apparent. New researchers should be aware that their research debut (initial entry into this iterative process) is likely to be difficult, but that repeated cycles become progressively less difficult. In fact, this observation may explain why health promotion researchers often tend to specialize in a narrowly defined field of study (such as prevention of adult-onset diabetes, prevention of HIV infection among women, or promoting Pap testing among Latinas).

After the researcher (or research team) has successfully answered the research questions, the remaining task is to prepare written and visual (that is, tables and figures of study results) summaries of the research process (steps 1 through 8). Recall from step 2 that research is a collective process; therefore disseminating the results adds to the larger empirical knowledge base. Fortunately, the preparation of written and visual summaries does not have to be a daunting task. In fact, when

rigor is high, this task can be very satisfying and enjoyable. The task is primarily a historical account of the rationale underlying the research questions and the protocols used to answer these questions. Researchers customarily bring the task to a close by suggesting subsequent research questions that could be investigated to further strengthen and expand the research base.

Dissemination of the research findings is widely embraced as a key part of the scientific process. The written and visual records can then be disseminated through multiple channels. Oral presentation of the findings at professional meetings is generally a first step. These presentations create opportunities for informal peer review of the research and study conclusions—peer review is a valued and vital aspect of science. Submission of the written summary to an appropriate professional journal provides opportunity for formal peer review.

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In a Nutshell

Dissemination of the research findings is widely embraced as a key part of the scientific process.

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Returning to the vignette, suppose the conclusions have been written and appear as follows:

> In this study of three hundred low-income teens residing in rural, tobacco-producing states, we found that a twelve-hour tobacco-dependence prevention program was equally efficacious compared to a similar program lasting only six hours. The mean number of cigarettes smoked (in one week) for teens in the twelve-hour program and in the six-hour program was significantly lower relative to the number of cigarettes smoked by teens who did not receive either program. Findings suggest that these small-group interventions may be an important strategy for interrupting the formation of tobacco dependence among members of the study population. Further research should continue to investigate the efficacy of this program among teens residing in largely metropolitan states.

Peer review may help identify the strengths and weaknesses of the study and its conclusions. For example, a reviewer might ask, "Do the results truly indicate interruption of dependence?" Another reviewer might ask, "How were rural, tobacco-producing states defined?" Questions derived from the peer-review process

can help researchers identify the limitations of the study and its contribution to the health promotion literature base.

When steps 1 through 8 have been thoroughly addressed, and the peer-review process has been successfully navigated, the final product will generally take the form of a published journal article (Chapter Fourteen provides more details related to the publishing of research findings). In health promotion, however, publication of a journal article is *not* the endpoint in the research process. At least two other obligations exist. First, media relations should be cultivated and used to disseminate findings to the public. Second, successful health promotion programs should be made widely available. The process of translating science into practice is ongoing and labor intensive, but is also the cornerstone of health promotion practice.

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The Context of Health Promotion Research

The research process occurs in a context characterized by scholarship, grantsmanship, and vigilant attention to ethics. These three principles are highly valued and cherished in the profession. Scholarship implies that the researcher possesses an inherent curiosity regarding the research questions and a dedication to expanding the knowledge base in health promotion. Integrity is a key feature of scholarship. Like rigor in the research process, integrity in the researcher ensures a fair test of the research questions. Integrity implies that any preconceived desire to prove or disprove study hypotheses is not allowed to interfere with the research process. The research process is quite eloquent in that it forces objectivity; however, adherence to the process is based on self-report of the researcher (making integrity vital).

Grantsmanship is also a vital part of the research process. Rigor is often expensive, and obtaining funds for health promotion research is typically a competitive process. In addition to other factors (for example, quality of the research proposal, the importance of the topic and the population, and so on), grant awards, to some extent, are given based on the current degree of engagement in the iterative process shown in Figure 1.2.

Vigilant attention to ethics is the most critical of the three concerns briefly described here (see Chapter Three). Just as practitioners of medicine take the Hippocratic Oath, health promotion researchers must adopt the principle, "First, do no harm." Moreover, health promotion research is highly regulated by local and federal organizations that protect the rights of research participants. The nature of health promotion research demands studies of humans, and these studies are oftentimes directed at very personal (and therefore protected) behaviors.

Applied Example

A study published in the *American Journal of Public Health* provides a good illustration of the nine-step model. Hagan and colleagues (2001) selected a priority population for the prevention of infection with hepatitis C: injection drug users (step 1). Their research question was firmly grounded in the context of previous research. They noted that shared use of drug preparation equipment, in the absence of self-injection with a used syringe, had not been investigated as a source of transmission for the hepatitis C virus (HCV). Their primary research question was to assess the risk of HCV infection incurred by sharing cookers, cotton filters, and water used to rinse drug-injection syringes (step 2).

The study was strictly observational (step 3). A panel study design (with a one-year follow-up) was used. This design is relatively advanced with respect to its location on the trajectory of research shown in Figure 1.1. Only persons initially testing negative for HCV were included in the study. This approach allowed the investigators to compare drug equipment sharing behavior—in the ensuing year—between those who tested positive (seroconverted) and those who tested negative for HCV at the one-year follow-up assessment (step 4). Selected variables included the assessment of race, age, sex, homelessness, sexual behaviors, types of drugs injected, and a battery of measures related to drug equipment sharing behaviors. HCV was assessed through a reliable and valid blood assay (step 5).

The sample comprised a subset of 507 people who were drawn from a larger sample of injection drug users from nine locations in Seattle, Washington. At each location, a random-numbers table was used to select a representative portion of eligible participants (step 6). Unfortunately, procedures used for quality assurance of the data-collection process were not described (step 7). Data were analyzed separately for persons who reported injecting with previously used syringes and those not reporting this form of risk. Among those reporting this risk, persons sharing cookers or cotton were 3.8 times more likely to acquire HCV over the observation period of one year. This difference was significant (that is, not attributable to chance). Significant differences with respect to shared cleaning water were not observed (step 8).

The research team concluded by suggesting that HCV infection may be commonly transmitted by sharing cookers and filtration cotton. This conclusion squarely addressed the research question and provided a valuable extension to the research base. The high degree of rigor, combined with an important research question, yielded findings that contributed to health promotion practice (the initial portion of step 9). From a practice perspective, the finding suggests that injection drug users can benefit from health education efforts that create awareness of HCV risk as a consequence of cooker and cotton sharing. Dissemination of the written report in the *American Journal of Public Health* made this information available to thousands of journal subscribers, untold numbers of media organizations, and (via electronic posting on engines such as Medline) to most anyone with access to the Internet (step 9).

Summary

Health promotion practice and policy should be based on rigorous research. This chapter has provided a thumbnail sketch of the research process as it applies to health promotion. This sketch can be used as a platform to gain competence and proficiency in each of the nine steps described. Competence and proficiency in scholarship, grantsmanship, and ethics should be an equally high priority. The remainder of this volume is devoted to expanding this thumbnail sketch into a more complete primer of health promotion research methods.

Issues to Consider

1. An overriding issue is whether health promotion practice should always be grounded in research. Consider, for example, the emergence of the AIDS epidemic in the United States. By the mid-1980s, the rapid escalation of HIV infection demanded an immediate and escalated public health response (Garrett, 1994). Unfortunately, from a health promotion perspective, research chains specifically pertaining to behavioral intervention of HIV transmission had barely begun to form. In lieu of best practices based on research findings, health promotion programs were created to increase awareness of risk and provide people with essential prevention messages. In retrospect, the efficacy of these initial approaches to prevention may be questionable. Alternatively, the urgency of the epidemic demanded a response. An unfortunate reality of the research process is that it moves slowly. Given the inherent urgency, then, should practice perhaps sometimes proceed without research?

2. The research process as described in this chapter is designed to create objectivity in the investigation of any given research question. Suppose that a study high in rigor (and therefore objectivity) is funded by a drug company (Company Y). The study investigates behavioral compliance with an arthritis medication that typically caused temporary side effects. Furthermore, suppose that the findings indicates that compliance was extremely low due to a nearly universal physical intolerance among study participants for the drug. The research team proceeds to step 9 and is informed by Company Y that dissemination should not occur. Considering the principles of scholarship and ethics, how should the research team respond?
3. The term "publication bias" has often been used to describe a tendency of journals to preferentially accept research reports that find significant results (meaning the data supported a proposition that can add to the quality of health promotion practice). Conversely, studies with nonsignificant findings only provide insight on "things that won't work"; thus, these studies may be less attractive for publication. While nonsignificant findings are admittedly less exciting, they may nonetheless be based on important research questions and stem from rigorously conducted research. Yet, despite a high degree of importance and rigor, nonsignificant findings have very little practical meaning for anyone other than persons investigating questions in the same research chain. How can this seemingly irresolvable problem be addressed?

For Practice and Discussion

A philanthropic organization has asked you to design and conduct a study that can benefit the health of women by promoting regular Pap testing and annual mammography among post-menopausal women. After reviewing the surveillance data relevant to cervical cancer and breast cancer, you conclude that Hispanic women are a priority population for intervention (step 1). Next you develop a single but important research question: What are the cultural and economic barriers that preclude post-menopausal Hispanic women from receiving regular Pap tests and annual mammograms? (step 2). Having resolved steps 1 and 2, you begin to think about the planning phase of the study. Thus, you consider steps 4, 5, and 6. Please think each of these steps through carefully and create a rigorous plan to investigate this research question (if you have trouble with this, please try the exercise again after you have read the remaining chapters in this book).

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