

Introduction

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Scientists have long tried, with varied success, to explain the value of their work and to help put their findings to some use. Since the World Wars, and especially since President Johnson promoted his Great Society vision for the nation, behavioral scientists in particular have tried to use science-based innovations (knowledge, interventions, tools, and other technologies) to influence policy, to inform and persuade through mass media, and to improve vital services in society. After some turning away from the behavioral sciences in the 1980s, legislators, government agencies, service providers, advocacy groups, and private foundations increasingly seek to use the research to inform their decisions and practices. They are motivated at least in part by the wish to know whether the resources put into relieving society's problems and improving its health and well-being are producing the desired results and, if not, what more could be done. Many organizations also want to know, as do individual scientists, whether investments made in communicating science to policy makers, mass media, and others lead to taking up the science and using it in ways that benefit the public.

Despite this history and increasing demand for science-based approaches, researchers can lack realistic ideas about what communicating and disseminating science entails. They

are not necessarily to be blamed. Developing the essential knowledge, skills, and perspectives—or even imparting a basic awareness of what the work involves—is not part of most behavioral science training. In fact, no entity in particular has been especially prepared for studying, planning, conducting, and evaluating the communication and dissemination of behavioral science, or for training future generations of behavioral researchers to understand or do the work. As noted by Carol Weiss, a foremost scholar on the topic, dissemination has been nobody's job.

Yet, enough has been learned so that scientists need not put their efforts together willy-nilly. Much has been published on methods of delivering science-based innovations to policy, mass media, and service professions; the barriers encountered and how they might be removed; the qualities of science that make it worthy of disseminating in the first place; advances needed to research on dissemination and communication; the challenges unique to behavioral science; and so on. But all of this scholarship is strewn through the literatures of psychology, anthropology, journalism, science communications, public health, nursing, mental health, education, business, law, philosophy, science policy, and social policy, among others. To us, it seemed time to

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integrate some of this knowledge and insight into one volume to support those interested in knowing about and doing the work. In fact, as one reviewer of our book proposal said, it is hard to believe that the book wasn't already written.

OUR APPROACH

Our goal was not to comprehensively review all that has been offered or to include every discipline or profession that has something useful to say on the subject. Rather, we aimed for a coherent picture of what communicating and disseminating behavioral science involves—the main actors, issues, contemporary approaches, challenges, types of research, and broader conditions that influence if and how it occurs. And so we asked an interdisciplinary group of experts to describe relevant scholarship and practice and to present their informed perspectives to help readers gain insight into the complex web of ideas, concerns, activities, relationships, and environments that make up the work. Contributors include behavioral scientists from academia and government; scholars from journalism, science communication, and health policy; professional communicators from a university, scientific society, and national social issue campaign; journalists and editors from television, print, and radio; and representatives of think tanks and advocacy organizations.

Many of the topics that appear have complexities that could not possibly have been covered even in a book of this size. Some relevant disciplines—mass communications, advertising, marketing, health promotion, health communications, organization science, social marketing, program evaluation, and so on—are not discussed in detail. Only recently have diverse policy, research, and service organizations in the United States, Canada, and abroad begun to undertake the

tremendous task of surveying these and other literatures and distilling principles to be applied and tested in their efforts to support various uses of scientific research. Such initiatives mark what seems to be the beginning of a new age for both communication and dissemination research and practice. We've offered therefore an appendix of related resources for readers who seek broader and more detailed information.

A FEW ANCHORING DEFINITIONS

Though readers and chapter authors may quarrel over some of them, we offer definitions of key terms, derived from our reading of the relevant literatures and from the usages of the chapter authors, to help clarify the scope of the book.

Dissemination of behavioral science refers to the spreading of innovations from science to promote widespread awareness, understanding, and use. Though often used interchangeably with *diffusion*, many now associate diffusion with passive spreading that is spontaneous, unsystematic, slow, and unreliable. Common examples are presenting research in academic journals or at conferences or issuing press releases followed only by hoping that someone "out there" is picking up the findings. Dissemination, in contrast, is becoming associated with using more active, planned methods of promoting the initial widespread use of science innovations, helping users adapt them to meet local needs, and supporting sustained use.

In practice, *science communication* refers to the particular strategies and approaches used to convey information from scientific research, as well as about how to use science-based innovations or about the scientific enterprise (for example, how science progresses toward knowledge and is administered). It ranges from large-scale social marketing campaigns that promote messages

derived from science, to an advocate's use of science to influence policy makers' opinions, to the development and evaluation of museum exhibits.

The academic discipline of science communication is a broad and emerging area of scholarship. Some of its main concerns are the public's understanding of science, how science is delivered to and received by different audiences, the role of science in society, and the relationship between scientists and science communicators. Science journalism has tended to receive much attention from scholars given that it is part of mass media. The field is just beginning to describe ways of communicating science for particular audiences and purposes and the results. Most agree that the academic study of science communication could benefit from being more tightly linked to the study of communications more generally and to the practice of communicating science.

Some readers might consider dissemination to be the higher-order category, others may view communication to be the broader one, and still others may see no real difference between the two. In this book, communication is discussed mainly as being in the service of dissemination. Messages are communicated—to the public, mass media, policy makers, service providers, administrators, and so on—and ideas are exchanged to make the findings and other products of science widely available and to support their appropriate use.

Knowledge transfer, sometimes used interchangeably with *dissemination*, refers to moving knowledge, practices, and technologies within and between organizations. It includes conveying the attitudes, knowledge, and skills required for delivering and receiving these innovations to meet particular goals. Though sometimes used synonymously with *training* (e.g., guided experience, train-the-trainer programs, simulation, guided experimentation, work shadowing, paired

work), in research dissemination, the term encompasses a wider range of activities, such as producing and presenting research syntheses to inform policy making and service delivery; writing plain-language summaries of research results tailored to the goals and audience; equipping professionals in law, medicine, mental health, policy, and so on to recognize research that is sound and relevant to their fields; establishing relationships with the potential users of science to better understand their needs and work settings; and developing research agendas, both basic and applied, that can work toward basic understandings and products that help solve pressing problems.

Knowledge utilization refers to using innovations from science, but it goes beyond the mere taking up of information—considering research in a policy decision, deciding to use an evidence-based mental health intervention, or producing a news report on a recent research finding. It also encompasses how the research is used and with what outcome—selecting a policy option most consistent with the research that, in turn, ends up helping the public; implementing a mental health intervention as it was intended to be delivered that, in turn, improves mental health and practical life outcomes; and news reporting that is accurate and also perceived by the audience to be informative and useful. Because promoting uptake is much easier to do and to measure than determining how the research was used to produce certain results, many experts agree that these distinctions should be made when setting goals for dissemination and developing plans to evaluate its effect.

Knowledge exchange is a relatively newer term being used to encompass both knowledge transfer and knowledge utilization. It emerged to capture the bidirectional communications between those who transfer the knowledge and those who use it and which are critical to making it more likely that

innovations from science will be understood, used, and valued.

Many of the chapters discuss changes to various types of research that could advance dissemination. In these discussions, basic behavioral and social research refers to understanding the causes and conditions of psychological or social phenomena without having specific applications in mind. *Applied research* covers studies to produce new understandings for meeting a recognized need. It includes *translational research* to develop knowledge from basic science into new interventions, small- and large-scale studies to assess intervention outcomes (usually referred to as *efficacy and effectiveness studies*, respectively), and *evaluation research*, a term used mainly in policy or service settings to refer to assessing the results of a services program, policy, or communications strategy.

Any research, including basic science experiments, that intervenes to change the thoughts, behaviors, or conditions of those participating in research studies qualifies as intervention. But the type of *intervention research* most relevant to this book is that which uses scientific methods to develop and evaluate the effectiveness of practices, programs, and tools to meet the needs of particular individuals, groups, systems, or settings.

Transportability research, one type of translational research, helps prepare the interventions found to be effective under tightly controlled experiments for implementation in the broader settings, where they will actually be used. It carefully specifies the intervention components and implementation procedures along with any materials needed for delivery and training. It specifies who can deliver the intervention effectively and under which conditions. Most agree that some amount of transportability research should occur in the context of large-scale effectiveness studies before attempting broad dissemination. Innovations that are disseminated prematurely often end up not fitting people's

circumstances and needs and potentially "poison the waters" not only for a particular intervention but for the entire idea of using empirically validated information and approaches (Schoenwald & Hoagwood, 2001).

Implementation refers to the collection of actions to be taken by "front-line" users, such as clinicians and community service providers, to deliver a science-based practice or program or to use a particular tool. *Implementation research* specifies these actions and, especially in large-scale implementation studies, ideally investigates the broader conditions that affected whether implementation occurred as intended and produced the desired results. Thus, implementation research is one part of investigating transportability and so is also considered translational research.

Dissemination research investigates how to promote the widespread use of innovations from science. It identifies and evaluates approaches for encouraging awareness, understanding and uptake of innovations, and how to put the conditions in place for sustained use. Until recently, dissemination research was not a priority of the scientific enterprise and not widely regarded as scientific work. Though some studies might include a dissemination component, plans to evaluate dissemination have not been routinely solicited or made, and innovations from science, including interventions for mental health, drug use prevention, and so on, traditionally have not been developed and tested with particular dissemination objectives in mind.

TWO ORGANIZING THEMES

This book discusses many complexities involved in brokering science to diverse audiences, whether the broker is a scientist or an intermediary—a federal agency, private foundation, university public information

official, think tank or advocacy organization, a technical assistance center, the mass media, or one of the growing numbers of issue networks and coalitions. The authors also give many specific suggestions about how to approach communicating and disseminating behavioral science.

These individual strands of knowledge and insight can be tied together with two main principles: One must have a strategy for dissemination, and one must understand the context in which dissemination occurs, especially if barriers are to be removed that affect whether findings from behavioral science move efficiently and effectively beyond the academic community.

Strategy

We've borrowed, and somewhat modified, a knowledge exchange framework proposed by John Lavis, a leader in the use of research in health practice and policy, to emphasize that supporting the use of behavioral research requires a strategy with five main parts (Lavis et al., 2003).

What should be transferred? What science is ready to use—what knowledge is sufficiently developed, sound, and relevant to the purpose? What messages are appropriate and consistent with the science? What interventions, tools, and other technologies are ready to deliver? Methods and mechanisms must be created to help answer these questions, and if the appropriate “what” is not being produced, solutions are needed to further develop it.

To whom should these be transferred? The possibilities tend to include the broader public or service recipients (for example, citizens, patients, and clients), service providers (such as clinicians, journalists, and attorneys), and decision makers (for example, managers and administrators in hospitals, private business, and community organizations; media journalists, producers, and

editors; and policy makers at federal, state, and local levels). The messages and materials must be sufficiently tailored in format and content, delivering the particular findings that each audience will care about given that each has its own concerns. But one initial basic step, so basic perhaps that it has often been overlooked, is to thoroughly understand the audience—its needs, roles, circumstances, knowledge, motivations, values, beliefs, ways of interpreting and processing information from science, and so on. In this way, messengers can relay better messages and plan strategies to help audiences take up the science and use it with the desired outcome.

By whom should these be transferred? The options are the individual scientist or one or more intermediaries. Issues to consider are as follows: Who has the knowledge, skills, credibility, and relationships to be a powerful messenger or an effective technician in helping others to use a particular innovation? And if any of these prerequisites is lacking, whether in the scientist or the intermediary, how might these be developed?

By what methods should transfer occur? What venues, materials, and procedures are most appropriate? Some of the options, depending on the audience and what is to be transferred, might include various methods of offering training and technical assistance, policy maker briefings, “collaboratives” that bring together all of those with a stake in an issue to plan how dissemination might be achieved and how implementation will occur, interviews with targeted or mass media, roundtable discussions, personal meetings with policy makers or program administrators, executive summaries, lists of evidence-based interventions and measures, evidence-based clinical guidelines, policy changes to encourage use of evidence-based practices, and so on.

With what effect? What is the goal of the exchange? Is it to promote awareness of a

new finding or the scientific process? Is it to change attitudes about an issue or practice? Is it to modify an organizational climate, change a policy debate, or somehow affect a particular policy or journalistic practice? How should the results be evaluated? What outcomes can be measured? Which parts of the approach worked, and which did not? How can this information be used to make improvements? Despite being mentioned last, most agree that, though it rarely happens, goals for dissemination should be clearly defined from the beginning along with plans to evaluate whether the goals were achieved.

This book assumes that some degree of strategy is needed whether the dissemination is a complex, large-scale collaboration among various organizations or a more modest undertaking by an individual scientist. But before embarking on any effort to disseminate science, many scholars recommend that the scientists who participate become aware of the values, beliefs, and other preconceptions that affect the kind of research they do and their motivations for wanting to disseminate the science. Though scientists strive for the ideal of complete objectivity, in reality, they tend to align themselves, and their science, to varying degrees with particular groups and agendas. Some believe this approach enables scientists to be even more effective, though it has consequences for their ability to operate broadly as powerful messengers. And so, as suggested by one political science and communications expert, it can behoove scientists, and the science, to consider and then choose where one's attempts to communicate and disseminate science will fall on the continuum from "activist science" to "objectivist science" or, in other words, from advocate to neutral knowledge broker (Bimber, 1996).

Context

Figure 1 applies ecological systems theory, originally conceived to describe individual

human development (Bronfenbrenner, 1979), to understanding how forces in four nested systems—the microsystem (forces in the scientist's immediate environment), the mesosystem (interactions between two microsystem forces), the exosystem (forces affecting the micro- or mesosystems) and the macrosystem (systems making up the environment in which all the other systems operate)—interact to affect how, or if, the individual scientist contributes to the effective use of science. The model assumes bidirectional interactions among the forces within and between levels, and the element of time speaks to how change or stagnancy in the forces or in their interactions supports or thwarts attempts to disseminate behavioral research.

At the individual level, for example, scientists must be personally motivated to disseminate behavioral research. Some of the most common motivations contain varying degrees of public and self-interest:

- A personal desire to identify and help solve significant problems about which behavioral science does or could have something to offer
- A perceived professional and ethical responsibility to be good stewards of science by shepherding the effective use of research and preventing misuse and misrepresentation
- A perceived obligation to justify to society how public funds have been used by answering the following: What was bought? Who needs it? What's the point?
- A belief that greater public understanding of behavioral research leads to increased public support, funding, and the growth of the field
- A belief in the Jeffersonian ideal that creating an educated public is essential to an informed democracy and that governing bodies need access to expert advice (without supplanting the public's need to be directly informed and knowledgeable)
- A belief in the inherent value of an educated public to improving the quality of individual and collective life

But researchers can also hesitate to become involved because they fear that disseminating research might harm their reputations in the scientific community. Some believe that, being a relatively young science, most behavioral science is “not ready” for mass media, policy, or any particular purpose or that science generally

is never quite ready because it is continually evolving and inherently uncertain. Researchers who support dissemination often think, quite mistakenly, that others “out there” already have been sufficiently trained to identify, understand, and use the appropriate evidence-based programs, tools, and research findings.

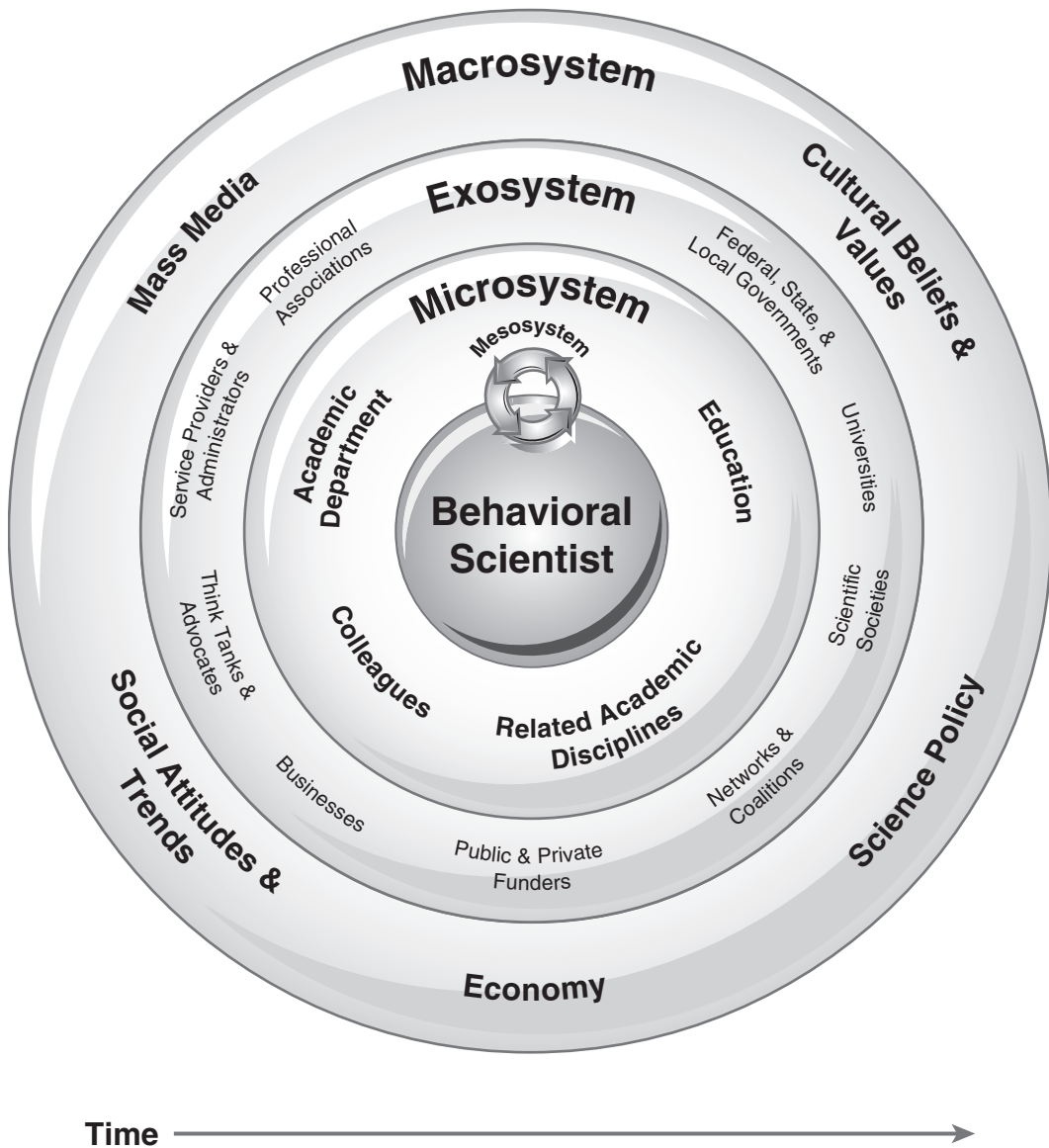


Figure 1 An Ecological Model of Behavioral Science Dissemination

SOURCE: Inspired by Fabes, Martin, Hanish, and Updegraff (2000).

Still, even the personally motivated scientists will encounter forces, many of which are presented in Figure 1, that affect whether they have the essential preparation and support to do the work. To scratch the surface:

Scientists are affected by whether the essential *graduate and postgraduate education* can be found to develop the knowledge, skills, and perspectives needed for disseminating science, whether in the form of graduate courses, postgraduate applied training, or professional development opportunities. If in the academy, scientists benefit from *academic departments* that value, tangibly support, and reward dissemination and dissemination research, as well as from colleagues, including journal editors, who understand and support the work.

Whether or not this support can be found depends on the priorities of the *university* system and culture. Despite a bit of progress and some isolated exceptions, universities generally have not perceived dissemination to be part of research and scholarship but instead view it as service that ranks last among the main university priorities. As a result, relatively few resources are available for it, and it is not part of the work on which scientists are seriously evaluated, and so scientists tend not to see it as their responsibility.

Connections among the behavioral sciences and between behavioral science and *other academic disciplines* also affect the quality of the information and other products to be disseminated, as well as the level of understanding about dissemination itself that can be achieved.

Private foundations, federal agencies, and scientific societies deliver or otherwise influence the resources and infrastructure available for dissemination and for research to develop the theories, methods, and measures needed to more systematically develop and test the effectiveness of various approaches. These actors also influence the availability and quality of education and training for

dissemination and communication practices and research. Their interactions with university leaders help to shape the priorities and expectations for academic departments and so the direction of individual scientists.

In many ways, the heart of effective dissemination is the relationships between scientists and potential users of the science—policy makers and their staffs in local, state, and federal governments; mass media producers, editors, and journalists; decision makers in service professions; community members and organizations; and so on. Written and spoken exchanges over time build mutual credibility and trust, leading to further productive collaborations and some level of informality that allows scientists to share nuances about the research and make recommendations in which the users have greater confidence. Scientists also take away from these relationships ideas that affect the direction of their research and approaches to disseminating it, goals that often can be mutually agreed on and coordinated. The scientist's success with dissemination depends on having the ability, time, and opportunity to establish these relationships.

Businesses, professional associations, and consumer networks can play powerful roles. Businesses can help develop products from research, such as educational curricula. They can also have a stake in the services that behavioral science helps to provide (educational, mental health, medical services, etc.). As a result, businesses may help to spread messages from the science, persuade others about the importance of evidence-based tools and services, and provide incentives for using them. Professional associations and consumer networks can help researchers learn about the needs and concerns of certain segments of the public and can help researchers educate those who could benefit from using scientific innovations.

Federal public policy and the surrounding politics offer many opportunities for

behavioral scientists, but it also places constraints on how scientists can engage in policy making, whether operating directly or indirectly through intermediaries, and how productive their attempts will be. Both federal science policy and social policy can help to drive or influence the forces at each level with a role to play in dissemination. They can also be influenced to encourage the dissemination of science-based innovations and to support the production of useful dissemination research.

Differences in *culture* between the scientific community and forces at all levels can make scientists and relevant organizations reluctant to engage with one another or lead to negative experiences and poor outcomes. Diverging goals, values, skills, motivations, attitudes, communication styles, preferred sorts of evidence, demands of the work setting, and so on must somehow be bridged. Additional challenges present themselves when the larger culture holds beliefs and values, or contains social attitudes and trends, that its members perceive to contradict scientific findings and methods or prevent them from becoming knowledgeable about science generally or about the methods and innovations of behavioral science in particular.

We return to these two themes of strategy and context in the concluding chapter to organize a discussion of the book's major themes and authors' proposals for the future.

BOOK OUTLINE

This volume has five parts. Part I, *Some Conceptual and Practical Issues*, begins with a selected history of behavioral science dissemination, some lessons learned from that history, and a proposal for advancing dissemination through "collaboratives." The second chapter contributed by science communication scholars describes the academic discipline and highlights contemporary

themes of the research. It also points to the need for scholars, including behavioral and social scientists, to undertake programmatic research to identify effective approaches and strategies for communicating science. Chapters 3 and 4, contributed by journalism scholars, present insights from research and practice on the conditions that affect how, or whether, behavioral science gets covered in the mass media. They discuss strengths and weaknesses in behavioral science reporting, the challenges of reporting behavioral research as news given the complexities and uncertainties of science, and ways that scientists might affect the quality and amount of behavioral science coverage.

Chapter 5 uses illustrations from social psychology to explain the qualities of basic science that affect its usefulness, as well as the challenges of writing and talking about basic science to nonscientist audiences. Chapter 6 explains the barriers that universities present to dissemination and reviews recent perspectives on how the work might become better integrated into university scholarship and science.

In Part II, *Understanding Mass Media Priorities and Processes*, journalists and editors from television, print, and public radio explain the inner workings of news media and how they affect coverage of behavioral research. The authors explain how behavioral science tends to become part of news; describe the goals of journalists, producers, and editors; suggest opportunities for reaching members of the media and developing relationships that can affect the amount and quality of coverage; and give tips on how to present scientific research to members of the media.

Part III, *Communicating With the Public*, covers some of the main methods scientists use to communicate with public audiences. Chapter 11 explains from the perspective of a scientific association's communications officer some issues to consider when engaging

with mass media, and it gives some of the basics of media interviews. In Chapter 12, researchers from developmental and educational psychology tell about their approach to popular speaking and writing, explain some of the challenges and rewards, and illustrate the contributions scientists can make by venturing outside the academy to learn about contemporary social issues and trends.

In Chapter 13, a leading university public communications expert explains the varied roles of public information officers, how they can support university scientists, and how scientists can build productive relationships with this critical intermediary between scientists and the media and broader public. In Chapter 14, behavioral researchers review research and share their expertise in using the Internet to promote awareness, understanding, and use of behavioral science.

Part IV, *Communicating With Policy Makers*, reviews scholarship, research, and practice relating to how behavioral science is delivered to and used by policy makers. In Chapter 15, a leading scholar of health policy and policy makers' use of research reviews the state of knowledge on how to make behavioral science valuable to policy makers. Chapter 16 focuses on federal public policy. It explains the critical importance of scientists' participation by illustrating how behavioral researchers have affected science policies vital to the field's interests and to public health. The chapter describes the knowledge and skills scientists should develop, opportunities to become part of policy making, and specific methods of engaging with Congress and the Executive Branch.

In Chapter 17, the director and the communications director of a large-scale, non-ideological national campaign to reduce teen pregnancy draw on their experiences working with state governments to discuss approaches to communicating research to policy makers at the state level and to

working across diverse interests to influence policy. In Chapter 18, a policy consultant and former legislative director describes the work of think tanks and advocacy organizations and how they use research to inform and affect policy.

Part V, *Disseminating Behavioral Science to Service Professions*, spotlights five fields: education, behavioral medicine, drug use prevention, mental health, and the military. These fields were selected to highlight contemporary approaches and themes in disseminating behavioral science and to illustrate particular challenges unique to each one. Authors cover, among other issues, the state of dissemination and dissemination research, the state of translational science, barriers typically encountered in dissemination, and suggestions for advancing dissemination research and practice.

As the outline makes clear, this book is not a "how-to" guide, though many of the chapters include "how-to" guidance. Instead, it helps to ground researchers in many of the relevant issues, practices, and research so they might get more mileage out of such "how-to" advice. "How to" has its place but, as many now realize, more than brief trainings and tutorials are needed to increase the effectiveness of the strategies and methods the field uses to communicate and disseminate science and for building a critical mass of scientists with the ability to help advance the field's approaches over time.

By the end of the volume, it should become even clearer, too, that *any* attempt at learning how to promote the awareness, understanding, and use of science, regardless of the discipline, *is* behavioral science. And so all such efforts present opportunities for behavioral researchers, no matter how basic or applied. The theories, knowledge, and tools developed in behavioral research can help all sciences thoroughly understand their audiences or potential users of the science,

develop their communication strategies and approaches, create techniques and environments that support using innovations from science, and conduct evaluations to assess the quality and results of their work. One group of science policy scholars has referred to this type of work as developing the “social technologies” (Sarewitz, Foladori, Invernizzi, & Garfinkel, 2004) essential to advancing the use of innovations from science. In creating

this volume, therefore, we were inspired by one fundamental idea: that discovering how best to communicate and disseminate behavioral science is itself a vital scientific enterprise, and great strides might be taken if, in some respect, it becomes every scientist’s concern and ceases to be on the side of behavioral scientists’ “real” jobs. We hope this book contributes to moving farther in that direction.

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