Integrating Psychology and Public Health

Challenges and Opportunities

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Psychology has made significant strides in developing applications relevant to public health. However, improvements are still needed to integrate psychology into the public health infrastructure. The challenge for public health is to recognize psychology's special contributions to policy and practice, especially to prevention of disease and injury. The challenge for psychology is to assure coherent integration of relevant theories, knowledge bases, and public health practice. Recommendations to address these challenges include (a) demonstrating how psychology incrementally improves public health service systems; (b) developing middle range and small theories of public health problems and practice (Lipsey, 1993; Merton, 1968); (c) developing intervention models in partnership with nonpsychologists so that the effects can become widespread; and (d) ongoing scrutiny of the intervention models to assure that theory has been operationalized well. Psychology's unique role in public health is to act as the steward of a correct application of behavioral knowledge and theory.

In the 1980s, health psychologists expanded their activities in public health as well as in medicine. In 1982 a special issue of the American Psychologist examined psychology's relationship with public health. The contributors noted the points of contact, some achievements of psychology in application to public health, and the general scientific areas in which psychology and public health could be of benefit to each other (DeLeon & Pallak, 1982). Among others, Singer and Krantz (1982) and Jeffery (1989) have distinguished public health from medical applications by examining public health's focus on the health of populations and on society as a whole. These researchers viewed a dual focus on individual-level behavior and on populations as a desirable one that could foster psychology's intellectual growth into areas such as public policy and community-based intervention.

A comprehensive case for psychology's relevance to public health problems was made by Winett, King, and Altman (1989), who outlined the importance of behavior in the most prevalent causes of illness and death in developed countries. They also described the achievements of behavioral theorists in addressing some major public health problems. By describing specific applications to a variety of activities that form a part of public health practice, Winett et al. demonstrated psychology's potential. They cautioned, however, that much of this potential had yet to be achieved.

In the mid-1990s, psychology is achieving increased acceptance in some diverse areas of public health policy and practice. Technology for smoking cessation and weight reduction are well established in patient care settings and community programs (Brownell, 1982; Burns, Cohen, Gritz, & Kottke, 1993; COMMIT Research Group, 1995a, 1995b). A variety of public health issues have been explored by psychologists, and those issues have been regularly addressed in the pages of the American Psychologist. The Association of Schools of Public Health requires that accredited programs include some exposure to behavioral science for all Masters of Public Health students (Miller, Fowler, & Bridgers, 1982). Although the behavioral science requirement is implemented inconsistently in public health graduate schools, academics in the other fields of study have at least some appreciation for the utility of psychology (Matthews & Avis, 1982).

Yet beyond a general application to health education and to certain interventions for lifestyle change, the public health infrastructure has not yet incorporated psychology's knowledge base. Nor has it recognized the variety of opportunities that psychology offers for promoting health. The public health infrastructure is defined as the organizational base from which public health goals are addressed in American society. The reader should recognize that the public health infrastructure provides routine services that may or may not be tested through research. Psychology has had a greater influence on research and demonstration activity—the temporary, limited, and innovative strategies to improve health in populations—than on the permanent and ongoing services of health departments and other organizations that provide public health. As the infrastructure learns to work more effec-
Integration of Psychology and Public Health: Challenges

Structural and Intellectual Challenges

The Institute of Medicine gave new insight and direction to the field of public health in its 1988 report *The Future of Public Health*. The report described a public health infrastructure made up of diverse and fragmented components, including (a) law and regulation; (b) enforcement of the law by inspectors and the courts; (c) the rank and file of state and local health departments; (d) community agencies when they devote attention to the health of populations; (e) the medical care system to the degree that it focuses on prevention and the well-being of populations; and (f) grassroots organizations that focus on public health goals. The report described planned systems such as those for sanitation, as well as de facto systems, such as medical care practices in which prevention activities can occur. Public health policy aims at gaining the support of these and other constituencies for relevant programs, laws, and resource allocation. Public health practice, in contrast, involves implementation and quality assurance for organized public health activities (Institute of Medicine, 1988).

Psychology still has much to contribute to both policy and practice. Winett et al. (1989) noted “surprisingly little integration” (p. xi) of the strengths of public health and health psychology. Their book contributed a framework for integrating the two fields. They noted several obstacles: the need for health psychologists to become familiar with the knowledge and skills of public health practice; the need to communicate effectively with public health policymakers and practitioners; the breadth of issues in public health; and a focus in public health on an empirical knowledge base as opposed to formal theory. Some of these represent challenges to psychology, including the need to translate behavioral effects into health consequences and to develop widespread, cost-effective interventions. Others are challenges to public health, including some traditions of the field that may impede integration.

Variation in Acceptance of Psychological Knowledge

Acceptance of the utility of psychology varies widely among public health practitioners (Matthews & Avis, 1982). Variation in its acceptance for policy becomes obvious to anyone reviewing the supporting documentation for the *Year 2000 Objectives for the Nation* (Public Health Service, 1990). References to psychological knowledge and technology are most plentiful in areas in which utility has been most thoroughly demonstrated; for example, in the areas of addiction and lifestyle changes to prevent chronic disease. Yet psychologists have applied their knowledge in highly diverse ways to public health problems. The way psychologists apply social cognitive theory to lifestyle change (Bandura, 1995) differs on many dimensions from the way psychologists advise environmental experts on risk perception and risk communication (Fischhoff, Bostrom, & Quadre, 1993; Slovic, Fischhoff, & Lichtenstein, 1987). Both of these applications differ dramatically from community psychologists’ activities in planning for drug abuse prevention in partnership with affected communities (Linney & Wandersman, 1991). Several authors who work at the intersection of psychology and public health encourage diversity by pointing to the application of a variety of theories and technologies in their frameworks (e.g., Fishbein et al., 1992; Leviton, 1989b; Prochaska, DiClemente, & Norcross, 1992; Winett et al., 1989).

The diversity of psychological approaches poses practical challenges to integration. Because policy and program responsibilities in public health are themselves fragmented, the diverse applications may not all come to decision makers’ attention. Even if they did, outsiders to psychology do not readily perceive that the various applications come from a single discipline. Public health practitioners look to an authoritative body, such as the Centers for Disease Control and Prevention, for guidance and standards of practice. They see no similar authority for guidance in applying psychological theory to health behaviors. Nevertheless, both policymakers and practitioners are increasingly aware that psychology is relevant to a wide variety of their tasks. Some policymakers and practitioners are simply puzzled about how to apply the new tools. As the Director of the Centers for Disease Control and Prevention recently put it, “You have convinced me that behavioral science is important. Now, tell me how to use it.”

Can we show public health how to use psychology? We, as psychologists, are still learning how to use it to address public health problems. In the long run, improvements in integration may come through the creation of more general health behavior theories (e.g., Ewart, 1991). However, the public has pressing health needs in the short term. Iscoe (1982) pointed out that public health expects action research from psychology: the application of methods and theory to concrete public health problems. Thus the aim of this article is to outline some incremental—less than perfect, but practical—applications of psychology to public health policy and programs. To achieve incremental improvement, a diversity of approaches is required. Some illustrations are now presented.

Challenges for Public Health, Opportunities for Psychology

Certain traditions in public health are being actively debated by practitioners. In actuality, these debates present opportunities to illustrate the value of psychology. They are particularly convincing because they address some of public health’s most acute dilemmas.
Public health has long recognized a mistaken expectation that prevention will somehow offer complete protection (Cates & Hinman, 1992). Rarely can prevention activity achieve a 100% reduction in risk of disease—most options represent incremental improvements only (Russell, 1985). Yet past successes lead public health professionals to aspire to complete protection.

John Snow’s victory against cholera is often cited as an example of what public health can achieve (Lillienfeld & Lillienfeld, 1980). Snow was the physician who first demonstrated a practical relation between cholera and unsanitary water supplies. By removing the pump handle from a well, he probably ended an epidemic in the Soho district of London. The modern dilemma was voiced by a member of the audience at a 1994 workshop sponsored by the National Institute on Occupational Safety and Health. “We all want to be John Snow. We expect to remove a pump handle and eradicate disease. Well, we haven’t found a pump handle for these modern day problems.” The goal these days is not perfection, but the maximization of the achievable increment in protection.

Recognizing new opportunities for incremental improvements and demonstrating those improvements offers a major route toward integrating psychology into public health practice. Some improvements have behavioral science applications as their centerpiece. For example, public campaigns for lifestyle changes would fall into this category. Other applications are more modest and improve an existing service delivery system, program, or policy. In all cases, it is necessary not merely to show behavior change, but to show how such change improves the effectiveness of public health systems.

An example comes from a seminal policy analysis of hypertension control conducted by Weinstein and Stason (1976). Figure 1 is a flow chart representing a public health system in which people are screened for hypertension, are detected as having high blood pressure, begin medical care for the condition, are treated or not treated, stay in treatment or not, and have their blood pressure controlled or not. (A later rendition would probably include adherence to medication or not as an explicit stage in the process.) Each stage in the flow chart represents an activity and each step a transitional probability; potential participants are lost at each stage between initial blood pressure screening and the endpoint of hypertension control.

The probability of getting to the next stage might be incrementally improved by adding resources or interventions. Through analysis of these probabilities, Weinstein and Stason (1976) were able to demonstrate that additional dollars could be used more effectively by improving the later stages (i.e., achieving control) rather than the earlier stages (i.e., detecting additional hypertensives). Note that the crucial stages represent behavioral interventions: keeping people under a physician’s care and improving adherence to treatment. Psychologists have long recognized these obstacles and have contributed substantially to techniques that improve adherence (Leventhal, Meyer, & Gutmann, 1980; Leventhal, Zimmerman, & Gutmann, 1984). The purpose of this article, however, is to provide a case in point in which psychology improves on the existing strategies. It is not the centerpiece, but it is highly relevant to improving the transitional probabilities in a system of services.

The analysis of transitional probabilities (and incremental successes) can be adapted to many public health problems and services, ranging from immunization to exercise (Russell, 1985) and from needle exchange programs (Kaplan & Brandeau, 1994) to rat control (Levitan, 1983). Psychology has sometimes contributed to public health program development by identifying stages of scree...
Service delivery (e.g., Leventhal, Zimmerman, & Gutmann, 1984) or by showing practitioners how clients can make the transition to the next stage (Prochaska, DiClemente, & Norcross, 1992).

State-stage modeling becomes an important tool for integrating psychology and public health. The models have appeal for public health policymakers, who find probabilities and estimates of risk reduction to be persuasive. Practitioners also find the flow charts used in such models to be helpful because they illustrate the components of service delivery and provide a basis for program improvement. The models are also helpful because they fit with the public health tradition. Unlike practitioners in many other fields, public health staff are accustomed to outlining measurable objectives for service delivery. Flow charts illustrate how objectives build upon each other, and they can depict how improvements in outcomes can be achieved through tinkering with service delivery (Suchman, 1967).

**Exhortation Is not Enough**

Practitioners committed to health feel that people should listen to them. Yet the Institute of Medicine (1988) noted that the public does not seem to understand the need for public health measures. Perhaps it has seldom done so. An obituary of Chadwick, the great sanitarian of the Victorian age, stated, "had he killed in battle as many as he saved by sanitation he would have had equestrian statues by the dozen put up in his memory" (Gray, 1979, p. 278).

Public health's alliance with medicine may be partly responsible for the tendency to exhort. Leventhal, Zimmerman, and Gutmann (1984) contrasted medicine's focus on prescribing behavior change with psychology's focus on enabling the conditions for behavior change. However, public health has a unique social mission that also drives its communication style. Public health evolved over centuries, as individual communities and then states agreed that their collective interest demanded quarantines, sanitation, and other measures (Rosen, 1958). Cole (1994) cited an informed public as one of the major justifications of the public health enterprise. The media has presented the Surgeon General as using "the bully pulpit" to encourage healthful behavior.

Public health professionals are earnestly seeking alternative ways to communicate about health problems. Some communication strategies derived from psychology address lifestyle issues and synthesize psychological theory and social marketing (e.g., LeFebvre & Flora, 1988; McAllister, 1991). Other psychological strategies are surprising, at least to public health professionals. For example, when engineers and toxicologists face citizens who are suspicious and angry over an environmental problem (Harris, 1984), they often come to value psychology's contributions to risk communication (National Research Council, 1989b). The same applies to state and local public health officials who are actively debating the need to work in partnership with communities (Centers for Disease Control, 1985; National Association of County Health Officials, 1991). Community psychologists can assist health officials as they establish a different type of engagement with communities from the top-down, authoritative statement (Tanabe, 1982).

**Cost and Consequences of Mandates**

Reliance on mandated health and safety standards are a third public health tradition, one under review at the highest level of government (see, e.g., the National Performance Review, 1995, on "reinventing" the Occupational Safety and Health Administration). Public health mandates were and are enforced as part of governments' police powers, as infectious persons and unsanitary conditions pose a clear and present danger to society (Cole, 1994; Risse, 1988; Rosen, 1958). Indeed, some European countries instituted "health police" during the 18th and 19th centuries (Rosen, 1958). Although some opposed the consequent limitations on individual liberty, the limitations were generally accepted as important to the community's welfare (Beauchamp, 1985; Porter & Porter, 1988). However, public health professionals need to recognize that sometimes mandates are not feasible, may cost too much, or may not be acceptable to address modern public health problems. The trend is toward less regulation and toward decreasing government resources for enforcement.

Psychology can improve the available strategies in at least three ways: (a) by identifying realistic alternatives to mandates, (b) by reducing the need for inspection and enforcement, and (c) by helping to craft more effective mandates. Some compelling illustrations come from occupational health. In Minnesota, only one tenth of one percent of small businesses are inspected for health and safety in any given year—a situation typical of many states (Leviton & Sheehy, in press). Because small businesses employ the great majority of workers in the United States, this is a sobering figure. Therefore, practitioners are searching for lower cost alternatives, supplementing scarce inspection and enforcement resources and freeing resources to be used where they will have the greatest effect. Social marketing has been proposed to assist in one area, encouraging the adoption of low cost, protective technology by small business. The costly and labor-intensive process of inspection and enforcement can then increasingly be shifted to the small percentage of businesses that pose the greatest threat of injury and illness (Leviton & Sheehy, in press).

Psychology can help to conserve limited inspection and enforcement resources in other ways. The Occupational Safety and Health Administration is proposing the replacement of across-the-board inspection and enforcement with worker-management teams to identify and abate health and safety hazards (e.g., Gjessing, Schoenborn, & Cohen, 1994). Inspection and enforcement would then be reserved for those companies that fail to implement such teams (National Performance Review, 1995).

To increase the effectiveness of such decision-making teams, the knowledge base of group dynamics and group decision making is clearly relevant (Fiedler, 1967; Lippit, 1985). Voluntary efforts have been applied successfully
in the past; for example, community psychologists would recognize these same strategies in the National Urban Rat Control Program. Engagement of low-income neighborhoods often led to voluntary cleanup, which reduced health departments’ time and expense in taking people to court (Centers for Disease Control, 1977; Systems Research and Development Corporation, 1980).

Mandates are an important tool for lifestyle change: Psychology’s contributions in this area have increased an awareness that health psychology is not health education (Winett, King, & Altman, 1989). However, psychologists also have an opportunity to help craft these mandates. Psychologists are uniquely able to speak to the likely consequences of law and regulation affecting behavior—a prospective look at consequences is vital to the policymaker. For a model discussion of the behavioral consequences of policy, the reader should turn to an economist’s analysis, not a psychologist’s. Kenneth Warner’s (1983) analysis of seat belt laws and mandated airbags is a tour de force on likely consequences of policy. Behavioral scientists do sometimes contribute important information to discussions of policy consequences. For example, proposals for condom distribution to adolescents perturb citizens who worry that the programs may encourage sexual activity by teens. Evaluations indicate no basis for these fears (Holtgrave et al., 1995).

Summary of Public Health Challenges

I have presented some debates in public health policy and practice to which psychology can contribute. They are by no means comprehensive. However, they represent important dilemmas, and policymakers would be grateful for some solutions. Note that, in each example, applications of psychology do not replace the existing strategies or programs; rather, they provide a complement to incrementally improve those strategies. To realize the potential for such improvements, however, psychology faces some challenges of its own.

Some Challenges for Psychology

Public health policymakers will evaluate new behavioral interventions by the same criteria as existing strategies and programs. They want the following:

1. practically significant changes in health, or in the conditions conducive to health;
2. justification for every dollar spent. Scarce funds must be allocated rationally in an era of declining public resources; and
3. widespread interventions, so that change can be seen in entire populations.

Can Psychology Achieve Practically Significant Prevention Effects?

Even when public health practitioners acknowledge that behavioral intervention is required, they may express skepticism about effectiveness. For example, Mary Guinan, Assistant Director for Evaluation at the Centers for Disease Control’s Office of HIV/AIDS, believes much of the public health establishment is “in vaccination mode,” waiting for what they regard as a more powerful way to prevent AIDS. Therefore, almost every study of AIDS prevention begins with a reminder that behavioral interventions are the only available method to prevent infection (e.g., Guinan & Leviton, 1995). Public health experts in other problem areas have expressed skepticism as well (e.g., Baker, O’Neill, Ginsberg, & Guohua, 1992), and it has been reinforced by the recent pessimistic results of the Minnesota Heart Health Study (Luepker et al., 1994) and the COMMIT trial for smoking cessation (COMMIT Research Group, 1995a, 1995b).

Behavioral intervention can indeed be practically significant when effect sizes are compared with those of medical interventions generally regarded as effective (Lipsey & Wilson, 1993). However, evaluations of medical interventions commonly translate effect sizes into their practical implications for health or for public health systems, whereas behavioral interventions do so less frequently. The tools to do so are readily available and should be used (Centers for Disease Control and Prevention, 1994; Kaplan, 1990; Kaplan & Brandeau, 1994; Pettiti, 1994; Weinstein & Stason, 1976).

Behavioral interventions sometimes appear at a disadvantage because their effects take time to become expressed in health terms (e.g., Oster, Colditz, & Kelly, 1984). Also, the so-called “hard outcomes” of illness and death may be difficult to obtain for logistic reasons. For example, no study of HIV prevention has been able to demonstrate a decrease in new HIV cases, because the prevalence data are usually not available and the incidence of new cases is too low to develop meaningful comparisons (Leviton & Valdiserri, 1990; National Research Council, 1989a). Some health effects of behavioral interventions take substantial time and large numbers of participants before they are seen. To ask behavioral interventions to produce measurable health outcomes under less than adequate circumstances is the equivalent of asking a clinical drug trial to assess effectiveness without sufficient time or power.

As a substitute for direct assessment of practically significant health effects, it is sometimes defensible to project or model the likely effects on health from the obtained behavior results. This is feasible when the clinical trials demonstrating those health effects have been conducted or when a sensitivity analysis of likely effects can provide satisfactory information about upper and lower bounds on estimates of health outcomes. Such projections have been made for HIV infection and prevention (Kaplan, 1990; Kaplan & Brandeau, 1994), for health and economic effects of smoking and quitting (Oster, Colditz, & Kelly, 1984), and for hypertension control (Weinstein & Stason, 1976). As I shall demonstrate, this ability to model health effects also has implications for cost-effectiveness and cost-benefit analysis.

Can Psychology Help to Achieve Cost-Effective Interventions?

Increasingly, public health agencies are assessing cost, cost-effectiveness, and cost-benefit in order to justify
public expenditures on prevention (Russell, 1985). With
the recent publication of a handbook on prevention ef-
etiveness, the Centers for Disease Control and Preven-
tion aspires to bring these analyses to the evaluation of
every prevention activity (Centers for Disease Control and
Prevention, 1994). In particular, this publication focuses
on the incremental cost-effectiveness of adding resources
or components, a critical issue for some behavioral in-
terventions.

Prevention itself does not always save money—nor
should it (Russell, 1985). We still need to know the cost.
Also, for some prevention programs, convincing “break
even” analyses are available. According to such analyses,
behavioral interventions can fare reasonably well. For ex-
ample, most employers will at least break even from
worksite hypertension control programs, seat belt cam-
paigns, and some smoking cessation programs (Leviton,
used break even analyses to demonstrate that if even one
HIV infection were prevented by a behavioral campaign,
the savings to society would justify the expense of many
programs.

Policymakers in public health sometimes view be-
havioral intervention as prohibitively labor intensive, be-
cause they equate it with one-on-one counseling by highly
trained and expensive staff. However, it can be instituted
through less expensive means. In fact, adding behavioral
components to medically oriented programs often in-
creases “reach,” and thus increases the marginal cost-
effectiveness of the medical intervention. For example, a
program for former chemical workers exposed to a blad-
er carcinogen used media and community-support
strategies to make recruitment and patient education less
labor-intensive than it would otherwise have been (Lev-
ton, Chen, Marsh, & Talbott, 1993).

Can Psychology Promote Widespread Effects?
The issue of “reach,” or penetration to affect entire pop-
ulations, has been discussed in health psychology for some
time now. It can be achieved in a variety of ways, including
social marketing (Lefebvre & Flora, 1988); marshalling
of community support through a variety of channels
(McAlister, 1991); working with medical professionals
(Burns, Cohen, Gritz, & Kotke, 1993) or schools (Glynn,
1989); and work with the public health rank and file
(Kamb, Dillon, & Fishbein, 1995). In line with the criteria
for good health promotion practices set forth by the
American Public Health Association (1987), all these
strategies involve working within existing organizational
structures.

To achieve widespread effects, work within existing
structures, and maintain cost-effectiveness, however, it is
often necessary to disseminate psychological principles
to nonpsychologists. Permanent improvements require
that these models be employed not only in research and
demonstrations, but in the infrastructure. This can occur
in several ways; there are excellent examples of each, but
also causes for concern. First, public health practitioners
may adopt models that were developed by psychologists,
as in the case of smoking cessation (e.g., COMMIT Re-
search Group, 1995a, 1995b). However, implementation
may be faulty in some cases, an issue that is important
to evaluators (e.g., Stone, McGraw, Osganian, & Elder,
1994). Disseminating existing models is troublesome be-
because innovations are often “reinvented” by those who
adopt them (Rogers, 1983). An important issue then be-
comes whether practitioners have adapted a model to the
situation or if they have actually transformed it into
something else. Judging the appropriateness of modifi-
cations requires more than simply measuring adherence
to a protocol. Departures from a protocol may be forced
by the situation, but might still be consistent with the
underlying theoretical model (Cook, Leviton, & Shad-
ish, 1985). But who judges the appropriateness of mod-
ifications? Who should determine whether a modifi-
cation is still a meaningful exemplar of a theory-driven
model?

Public health practitioners might also apply psycho-
logical theory independently, as is the case when health
educators apply the Health Belief Model as a framework
for encouraging breast self-examination (Rosenstock,
Strecher, & Becker, 1994). However, this raises other con-
cerns. Rogers (1983) described how some adopters of an
innovation can use it uncritically. In the same way, health
practitioners have sometimes adopted a theoretical
framework and used it judiciously when a careful anal-
ysis would call for consideration of an alternative frame-
work. But who determines the appropriateness of the
framework?

For both adoption of models and independent use
of theoretical frameworks, there is yet another concern.
Innovations are easier to modify when their components
are loosely “bundled,” that is to say, when adopters can
pick and choose among components rather than being
compelled to adopt the entire model or package (Rogers,
1983). Behavioral intervention models for public health
are for the most part loosely bundled innovations; yet
evaluators are highly concerned about maintaining effec-
tiveness in the face of a piecemeal, uncritical adoption of
components (Cook, Leviton, & Shadish, 1985). The same
applies to piecemeal adoption of theoretical concepts
without sufficient regard for their logical consistency in
a greater whole—the discomforts over both technical ec-
clecticism and theoretical integrationism (e.g., Bandura,
1995; Leventhal, Zimmerman, & Gutmann, 1984). These
are problems psychologists see within their own ranks,
let alone among public health practitioners. Who will de-
determine whether program components or theoretical
concepts have been integrated logically and consistently?

Summary of Psychology’s Challenges
Psychology faces three challenges to gaining recognition
for its applications to public health problems: (a) trans-
lating behavioral effects into health implications, (b)
demonstrating cost-effectiveness, and (c) gaining wide-
spread effects by working with the public health infra-
structure. Some of the tensions for psychology are made
evident, especially in work with the infrastructure, in
which the danger of "giving psychology away" is that the knowledge may be used inappropriately. I now turn to some ways to address those tensions.

**Recommendations**

**Compromises to Achieve Integration**

Psychology faces a dilemma: Public health demands big effect sizes and action research from psychologists. Integration of diverse behavior change techniques, theories, or knowledge bases could incrementally improve health outcomes. Yet integration makes theorists uneasy. It is too easy to integrate techniques or theories uncritically (Bandura, 1995; Leventhal, Meyer, & Gutmann, 1980). How can psychologists do so?

Over the longer term a comprehensive theory of health behavior may resolve the issue; over the short term several legitimate compromises can achieve integration. One compromise was a consensus outlined by Fishbein et al. (1992). These researchers stated that eight variables or theoretical concepts are the primary determinants of any given behavior. Through interview, observation, and content analysis, the variables can be made operational in a given situation. According to this view, integration is achieved only in context by developing interventions that focus on the variables most likely to achieve change.

A second, related compromise is to incorporate diverse elements of the knowledge base within a coherent, logical chain of public health objectives, as illustrated by the series of objectives or state-stages seen in the Weinstein and Stason (1976) framework of Figure 1. Examining the framework, it should be obvious that although a theory of adherence to medication is relevant to many of the stages, it will have its primary impact on interventions made specifically to improve treatment. Applications of other theories might assist at the earlier stages. As long as these theories do not conflict with the chosen adherence theory (either logically or in actual implementation), why should they not be incorporated to improve incremental effectiveness? Evaluation researchers often elicit these types of integrated theories when they test "small theories" of programs (Lipsey, 1993; Rossi & Freeman, 1993). Small theories can specify key intervening variables needed to obtain outcomes, or can incorporate causal diagrams or state-stage analyses such as the Weinstein and Stason (1976) framework.

A third compromise is to develop with public health practitioners what sociologists call theories of the middle range (Merton, 1968). Middle range theories are not the grand and all encompassing theories of behavior; rather, they can explain the health behavior of particular populations at risk. Relevant applications can flow from these middle range theories. Middle range theories can assist psychologists in the need to draw on disparate theoretical perspectives, an issue of great concern in the clinical literature that is beginning to be addressed in health psychology. For example, a middle range theory of adolescent risk for HIV and its prevention can draw upon social cognitive theory, but can legitimately combine it with theories of adolescence (Brown, DiClemente, & Reynolds, 1991; Kelly, Murphy, Sikkema, & Kalichman, 1993). If African American adolescents are the population targeted for prevention, then it would be the height of folly not to incorporate theories of culturally specific health practices. All of these are the subject of middle range theory. The approach still confers the advantages of a theory, because it is sufficiently general to be applied and tested in many situations: among gangs, runaway youth, or rural youth to name a few.

The integration of theories at the middle range is possible in health psychology because, unlike the behavioral and psychoanalytic therapists, health behavior psychologists generally agree on epistemology, or "ways of knowing" (Franks, 1984; Messer & Winokur, 1984). Furthermore, integration can be accomplished at the level of concepts in particular public health problems, an argument with some merit in clinical work as well (Wachtel, 1984). Finally, integration is possible because we are discussing different systems to be explained or explored (Schacht, 1984). It should be no more unusual to discuss a theory of adolescent behavior in the context of a health behavior theory than it is to discuss psychopharmacology in the context of behavior therapy.

**Development of Consensus About Appropriate Application**

Although scientific advancement requires diversity and debates, some consensus about public health applications would be desirable. Competing theories do not imply that the applications must be incompatible. Achieving at least some consensus may help health psychology to develop the "body of authority" that public health practitioners look for and that skeptics do not see. Psychologists are the ones who need to judge adaptations of a theory-driven model. Psychologists ideally judge the appropriateness of a theoretical framework and determine whether concepts have been integrated logically and consistently. This is the most important area in which psychologists differentiate themselves from health educators. Psychologists are the stewards of health behavior theory; by developing some consensus on applications, they can become better stewards.

**Integration as an Intellectual Partnership**

To assure the coherent integration of psychology into public health practice, neither the dissemination of intact models nor independent application of theory by practitioners is entirely satisfactory. Instead, there is evidence that psychologists and public health practitioners work best in partnership. Each possesses essential knowledge for the process.

Iscoe (1982) noted that public health practitioners can seem uncomfortable or awkward in applying psychology. In my experience, it is a skills issue. Often we simply describe the concepts of a theory to practitioners, assuming this is enough for them to achieve the required flexibility in application. Public health professionals can and do master the concepts. However, training and prep-
eration in psychology become important in deciding how far a behavior change program can be adapted as well as what constitutes a departure from a model or from coherent theory. Research psychologists spend their graduate careers and subsequent lives debating psychological theory, critiquing the logical relationships among theoretical concepts, appraising the quality of manipulation and the way concepts are operationalized, and testing hypotheses derived from theories. These skills are also required for a good application of theories to practical problems: An application is judged good or bad depending in part on the way the intervention (independent variable) and outcomes (dependent variables) are operationalized.

Public health practitioners spend their professional lives developing a different but equally important set of skills. As Iscoe (1982) gently reminded us, others have been there before us in developing behavior change interventions. It takes a great deal of skill to convince patients with a sexually transmitted disease to name their partners. Important insights into human nature belong to the public health nurses who climb tenement stairs to make sure people take tuberculosis medications or to check on a new mother and baby. They should be honored for their service.

In fact, the reflective public health practitioner has developed a considerable knowledge base about populations at risk for a disease. This knowledge is essential to craft sensible interventions, a process that is best carried out in conversation. Psychologists do not denigrate practitioner knowledge by calling it empirical rather than theory driven (Singer & Krantz, 1982; Winett, King, & Altman, 1989). Practitioners can articulate their implicit theories about service delivery, theories that psychologists may not have considered. Scholars of health behavior have gained important insights by eliciting such theories (e.g., Leventhal, Zimmerman, & Gutman, 1984).

**Summary and Conclusion**

Several compromises are proposed to integrate theory, knowledge, and disparate interventions. Such integration can incrementally improve public health systems. Integration could also help psychology to develop a body of authority with which to influence decisions about public health. Finally, a partnership with public health is proposed in which psychologists guide the correct application of our knowledge base to public health problems.

Integration, consensus, and partnership cannot be undertaken lightly. To achieve both the public health goals and psychology's scientific goals, the models that integrate knowledge bases need even more debate and discussion than they receive at present. Implementation of the models needs scrutiny by psychologists to assure correct operationalization. Finally, psychologists themselves need to provide more concrete guidance to public health practitioners on the use of the knowledge base for action research.

**REFERENCES**


Center for Disease Control. (1977). *Control of domestic rats and mice*. Atlanta, GA: USDHEW.


