

Overcoming Barriers to Collaboration Between Basic Behavioral Scientists and Public Health Scientists in Research on Mental Disorders

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The behavioral and public health sciences both have a long and rich history supporting basic, translational, and applied research aimed at improving human lives and reducing human suffering. Through the complementary expertise of these disciplines, investigators have contributed to significant, worldwide improvements in mental and physical health. Further gains can be achieved through collaborative research among scientists in these 2 fields. Unfortunately, there are a number of barriers to such collaboration originating in different intellectual traditions, research methods, and the structure and values of academia. We identify these barriers and potential strategies for overcoming them. Several areas for future collaborative research appear promising, especially comorbid mental and physical disorders, adherence to interventions, stigma, and emotional processes. Theory-guided preventive interventions may represent especially fertile areas of collaborative effort.

KEY WORDS: mental disorders; behavioral science; public health; prevention.

The basic behavioral sciences (such as psychology, sociology, and anthropology) and the public health sciences (such as epidemiology, biostatistics,

and health communication) have long traditions of encouraging research focused on the prevention and treatment of physical and mental disorders. Yet, these research efforts have not benefited especially from collaborative research between these two general fields. In part this is because behavioral and public health scientists often rely on different theories, methodological traditions, and dissemination strategies. The organization of universities and other institutions in which physical and mental health research is conducted also presents barriers to cross-talk among these disciplines.

The National Institute of Mental Health (NIMH), a component of the United States Public Health Service, convened a workshop, "Research on Mental Disorders: Overcoming Barriers to Collaborations Between Basic Behavioral Scientists and Public Health Scientists" on November 29–30, 2000, in Bethesda, Maryland, to identify these barriers and to promote a discussion of ways of overcoming them. Participants included investigators from both fields, representatives from a range of professional organizations and advocacy groups, and federal scientific staff,

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including representatives from the Centers for Disease Control and Prevention and from the Health Resources and Services Administration. The goal of the workshop was to promote collaborative, interdisciplinary research aimed at improving the public health, especially in the domain of mental disorders and associated disabilities. The purpose of this paper is to report on some of the findings from this workshop.

The basic behavioral sciences offer expertise that could be applied to a range of public health problems relevant to mental disorders, their symptoms, or associated disability. Pertinent areas of expertise in the basic behavioral sciences include, for example, research on motivation, emotion, cognitive processes, persuasion, interpersonal processes, sociocultural factors, and environments that afford certain behaviors. Findings from these and other basic research areas can help to explain why and how interventions in ecologically complex settings succeed or fail. Basic behavioral science research might also help us to understand why, in some cases, interventions have unintended adverse consequences, as has been the case for some high school suicide awareness programs (Overholser, Hemstreet, Spirito, & Vyse, 1989; Vieland, Whittle, Garland, Hicks, & Shaffer, 1991), college student eating-disorders interventions (Mann, Nolen-Hoeksema, Huang, Burgard, et al., 1997), programs to prevent a second heart attack in elderly women (Frasure-Smith et al., 1997), and the transplantation of human embryonic dopamine neurons into the brains of patients with Parkinson's Disease (Freed et al., 2001). Understanding basic behavioral processes when an intervention fails to achieve its goals or leads to adverse outcomes guides modifications in the intervention program that perhaps increase its efficacy. Basic behavioral science research is essential for developing theory that drives public health interventions, encouraging their appropriate generalization (Institute of Medicine, 1994; Muehrer & Koretz, 1992; National Advisory Mental Health Council Workgroup on Mental Disorders Prevention Research, 1998).

Public health science has a different but just as essential mission. Interventions often are based on findings from descriptive and experimental epidemiology, and their implementation can be guided by technologies and sensitivities gleaned from decades of relevant population-based research. Community based interventions with a strong public health orientation generally focus on populations rather than one-on-one provider to consumer interactions; actively involve community members and health service providers in

decision-making; utilize existing resources and community infrastructure; tailor the intervention to the cultural, environmental, and contextual make-up of the community setting; target an intervention strategy at multiple levels (e.g., individual, family, organization, environment, policy, community); and evaluate program impact at multiple levels from the individual to the community (Prohaska & Afifi, 2000).

The National Advisory Mental Health Council (NAMHC) Behavioral Science Workgroup reported that collaborative research between basic behavioral and public health scientists with a translational (theory to action) focus would likely lead to applicable findings for improving the lives of individuals with mental disorders (Brookhart, 2000). The NAMHC Report, "Translating Behavioral Science into Action" highlights three specific areas of study: (a) understanding basic behavioral processes in mental illness, (b) understanding how mental illnesses and their treatments affect the abilities of individuals to function in diverse settings and roles, and (c) understanding how social or other environmental contexts influence the etiology and prevention of mental illness and the treatment and care of those suffering from mental disorders. All three areas reflect pressing scientific opportunities for collaboration between basic behavioral scientists and public health scientists. (The full NAMHC report may be found at <http://www.nimh.nih.gov/tbsia/tbsiatoc.cfm>.)

THE BURDEN OF MENTAL DISORDERS AS A PUBLIC HEALTH PROBLEM

The clear links between individual lifestyle behaviors and physical health outcomes have been well documented, but the provision of information alone has not been sufficient to induce lasting behavior change. One reason, for some people, is that comorbid mental disorders impair affected individuals' abilities to initiate and sustain health-promoting behavior change. Furthermore, poorly understood biological, behavioral, and interpersonal mechanisms and processes mutually can exacerbate adverse outcomes in both the physical and mental domains. Mental disorders and symptoms also impair at-risk individuals' abilities to form lasting alliances with health-care providers and thus adhere to preventive and treatment protocols that enhance physical health. The stigma associated with mental disorders and interventions for them may delay help-seeking and mental health services utilization among those in need,

as well as clinical service provision and research by health care providers and investigators.

The detrimental impact of mental disorders throughout the world is enormous. According to World Health Organization, unipolar major depression will become the second leading cause of disability worldwide by the year 2020, second only to heart disease (Murray & Lopez, 1996). Among women, depression will be the leading cause of disability. Other mental disorders, such as bipolar disorder, schizophrenia, and obsessive-compulsive disorders, are also major contributors to disability worldwide. In the United States, 5–12% of men and 10–25% of women have a major depressive episode during their lifetime, and many more have difficulties with depression that fall short of criteria for major depressive disorder (Kessler et al., 1994; Regier et al., 1993). In the United States, the direct and indirect costs of depression are estimated to be \$43.7 billion per year (Greenberg, Stiglin, Finkelstein, Berndt, 1993). Depression and anxiety are associated with major risk factors for a wide range of physical disorders, including several leading causes of death such as heart disease, cancer, stroke, and diabetes (Neugebauer, 1999; Ustun, 1999). These risk factors include smoking, a diet high in fat, and a lack of regular exercise. By their nature, depression and anxiety, as well as the stigma associated with these disorders and with participating in interventions addressing them, can impede motivation, skills acquisition, and behavior change. Thus, alliances with health-care providers and adherence to public health interventions aimed at these risk factors can be undermined if comorbid mental disorders are unrecognized and untreated.

AREAS FOR COLLABORATION BETWEEN BASIC BEHAVIORAL AND PUBLIC HEALTH SCIENTISTS

Although there is a broad range of potential areas of collaboration between basic behavioral scientists and public health scientists, four are mentioned here as exemplars that merit particular attention: (a) comorbid depression and heart disease, (b) adherence to interventions, (c) stigma, and (d) basic emotional processes in mental disorders.

Comorbid Depression and Heart Disease

Research on comorbid mental and physical disorders is essential because of their widespread and

devastating impact. Regrettably, national or statewide population-based epidemiological data on the prevalence and distribution of comorbid mental and physical disorders in the United States do not exist. Thus, the ability to develop and target interventions aimed at potent, modifiable risk and protective factors is impeded. Basic behavioral and public health scientists might collaborate, for example, on research concerning comorbid depression and heart disease.

Heart disease is by far the leading cause of death in the United States among both men and women. If current trends continue, about one in three Americans will die of some form of heart disease. One out of every two American men and one out of every three women aged 40 and younger develops heart disease at some time in their lives (Levy, 1999).

As yet poorly understood mechanisms link depression and heart disease (see Schulz, Martire, Beach, & Scheier, 2000, and Musselman & Nemeroff, 2000, for a detailed discussion of potential mechanisms). Among men followed for 40 years, those who reported clinical depression were more than twice as likely to develop coronary artery disease than those who did not report clinical depression. The increased risk associated with clinical depression was present even for myocardial infarctions occurring 10 years after the onset of the first depressive episode (Ford et al., 1998). Penninx (2001) examined the risk for cardiac mortality in community-dwelling individuals over age 55 with and without cardiac disease at baseline. Individuals with depression were three to four times more likely to die over the next 4 years than those without depression. Furthermore, those with diagnosable depression were about twice as likely to die as those with depressive symptoms. Among women aged 67 or older, those with six or more depressive symptoms have twice the risk of death from heart disease compared with those who have five or fewer symptoms, even after the data are adjusted for potential confounds (Whooley & Browner, 1998).

A history of depression increases the risk of further depression during hospitalizations for heart disease and after discharge. Depression in hospital is associated with an increased risk of mortality 18 months after discharge (Frasure-Smith, Lesperance, & Talajic, 1995). Depression also appears to increase the risk for strokes. Simonsick, Wallace, Blazer, and Berkman (1995), in the Established Populations for Epidemiologic Studies of the Elderly, found that among those 65 and older, rates of stroke were 2.3–2.7 times higher in persons with “high” versus “low” levels of depressive symptoms.

Mild depressive symptoms in those older than 65 are associated with an increased likelihood of becoming disabled and a decreased chance of recovery, regardless of age, sex, and other factors that contribute to physical disability (Cronin-Stubbs et al., 2000). After adjustment for age, acute illness severity, comorbid physical illness, functional impairment, and cognitive impairment at the time of hospital admission, individuals over the age of 70 with six or more depressive symptoms had a higher death rate in the 3 years following admission compared to those with fewer symptoms (Covinsky et al., 1999).

It is clear that the burden associated with mental disorders alone is amplified when we consider their links to cardiovascular disorders. It seems reasonable, furthermore, that the suffering associated with mental disorders and with comorbid physical disorders could be alleviated if depression were recognized and targeted for intervention in public health settings, such as primary care offices. Depressed persons from the community are more likely to visit a primary care physician than a mental health professional, and most prescriptions for antidepressants are dispensed in general medical care (Ford, 2000; Regier et al., 1993; Shapiro, Skinner, Kessler, et al., 1984). Between 30–40% of primary care patients screen positive for significant levels of emotional distress, and as many as 25% meet criteria for a mental disorder diagnosis (Roter et al., 1995). In one study, almost one-third of individuals older than 60 visiting a primary care physician had at least one active mental disorder diagnosis (Lyness, Caine, King, Cox, & Yoediono, 1999). However, half of individuals with mental disorders meeting diagnostic criteria are not recognized by primary care physicians (Schulberg & Burns, 1988). And although half of all cases of depression in primary care settings are recognized, subsequent treatment often falls short of existing practice guidelines. Barriers to diagnosing and treating depression include stigma; patient somatization and denial; physician knowledge and skill limitations; limited time; lack of availability of providers and treatments; limitations of third-party insurance coverage; and restrictions on specialist, medication, and psychotherapeutic care (Goldman, Nielsen, & Champion, 1999).

Unfortunately, although a full range of treatments for depression has been shown to be efficacious in controlled clinical trials, these results have not yet been translated into improved effectiveness of treatment for depression in the context of routine medical care (Coyne, Klinkman, & Nease, in press). Individuals treated for depression in primary care set-

tings improve at or below the rate of patients receiving placebo treatment in clinical trials (Schulberg, Block, Madonia, et al., 1996). If the goal is to improve outcomes for all depressed people, not just those who self-identify as depressed, the gap between efficacy trials and what is achieved in routine medical care is even greater (Coyne et al., in press). The gap between the efficacy achieved in controlled clinical trials and what is achieved in routine care dwarfs the differences observed among alternative treatments in clinical trials. Furthermore, the determinants of effectiveness in routine medical care may be quite different from the determinants of efficacy in the typical controlled clinical trials conducted in specialty mental health settings (Hohmann, 1999). Bearing in mind that the barriers to diagnosing and treating depression in primary care settings noted above are formidable, there is little evidence that the care provided by primary care physicians for depression has changed in the past 20 years (Ford, 2000).

Basic behavioral research, however, might produce tools that facilitate physicians' ability to recognize and treat or refer individuals with depression. For example, a research-developed, two-question screen can detect depression with high sensitivity and moderate specificity (Whooley, Avins, Miranda, & Browner, 1997): (1) "During the past month, have you often been bothered by feeling down, depressed, or hopeless?" and (2) "During the past month, have you often been bothered by little interest or pleasure in doing things?" Furthermore, visits in which physicians identify and respond positively to patients' emotions tend to be shorter than visits in which such emotions are not addressed (Levinson, Gorawara-Bhat, & Lamb, 2000), perhaps because patients spend more time describing somatic complaints such as fatigue, pain, and sleep problems (Pearson et al., 1999). Patients' clues about their personal lives or emotions represent opportunities for physicians to demonstrate understanding and empathy and thus deepen a therapeutic alliance that may facilitate adherence.

A number of other findings about treatment for depression in primary care settings suggest important opportunities for basic behavioral scientists and public health scientists to collaborate. For example, although slightly more than half of those individuals with a mental disorder in the past year received mental health care, only 14% received care that could be considered consistent with evidence-based treatment recommendations. Even among those people with the most serious and disabling mental disorders, only one-quarter received treatment consistent with

guidelines. In addition to time constraints and reimbursement issues in primary care settings, what cognitive and other decision-making factors among physicians influence the nature of treatment offered when depression is recognized? Individuals who are White, female, severely ill, and with mental health insurance coverage were more likely to receive care consistent with guidelines (Wang, Bergland, & Kessler, 2000). Men, African Americans, those with less education, and those younger than 30 or older than 59 were less likely than others to receive appropriate care. In another study, physicians were less likely to detect mental health problems in African Americans, Hispanics, and individuals under 35 (Borowsky et al., 2000). Furthermore, those individuals with a mental disorder, especially phobic disorders, are less likely to receive regular medical care. Depression and alcohol abuse are associated with leaving regular care 1 year after survey data were gathered (Cooper-Patrick, Crum, Pratt, Eaton, & Ford, 1999). Physicians were less likely to believe that a patient had serious illness when presenting with a severe headache or abdominal pain if the patient had a history of depression or somatic complaints. Physicians were less likely to order tests for these patients (Graber et al., 2000). What factors associated with provider perceptions related to gender, age, racial/ethnic status, and the presence of mental disorders influence the nature of care offered? These are critical questions for basic behavioral scientists and public health scientists to address in collaboration.

Adherence

The most potent interventions will have limited public health impact if those who might benefit from them do not adhere to the strategies for behavior change recommended by their health-care providers. Unfortunately, there are ample data indicating that adherence to interventions for both mental and physical disorders falls short of desired levels. For example, compared with nondepressed patients, depressed patients are three times more likely to be non-adherent to medical recommendations (DiMatteo, Lepper, & Croghan, 2000). Federal Agency for Health Care Policy and Research (1993) guidelines recommend 7–12 months of antidepressant treatment for depressive episodes, yet over 40% of patients fail to complete a minimum of 4 months of such therapy, thus increasing the risk of relapse. Katon et al. (2001) have shown, however, that medication ad-

herence in primary care settings can be improved: A relapse prevention program targeted at primary care patients who had largely recovered after antidepressant treatment but who were at risk for relapse or recurrence significantly improved antidepressant adherence and depressive symptom outcomes. The extensive behavioral science literature on psychotherapy process, including the development and maintenance of the therapeutic alliance, could inform provider/consumer alliances across a range of public health contexts. Improving the alliances between health-care providers and consumers—and potentially improving adherence—could be reinforced by relevant findings from basic behavioral research on motivation, decision-making, and interpersonal processes.

Regrettably, research on adherence to interventions targeting mental disorders is scarce. A number of public health experts have recognized the detrimental impact of disorders such as depression or anxiety on health behaviors related to a wide range of medical outcomes, including top 10 leading causes of death such as heart disease, cancer, strokes, chronic obstructive pulmonary diseases, diabetes, suicide, and kidney diseases. Although treating depression or anxiety as a means to improve adherence to medical regimens may be sensible and feasible, the benefits of such treatment are limited if adherence to the treatments for depression or anxiety is not achieved first. Independent of the potential beneficial impact on comorbid medical outcomes, improved adherence to interventions aimed at mental disorders would have enormous public health significance in its own right because of the widespread suffering caused by mental disorders themselves. For example, the average length of disability and the disability relapse rate associated with depression are equal to or greater than those associated with common, chronic medical problems such as diabetes, hypertension, recent myocardial infarction, and/or congestive heart failure (Conti & Burton, 1994; Hays, Wells, Sherbourne, Rogers, & Spritzer, 1995).

Stigma

Stigma surrounding mental disorders and interventions for them impedes recognition, early identification, help-seeking, services provision, and adherence. As one of the most stigmatized groups in many societies around the world, people with mental disorders suffer not only from their illness but also from the added burden of discrimination, prejudice, and

even hate crime (Link, Phelan, Bresnahan, Stueve, & Pescosolido, 1999; Pescosolido, Monahan, Link, Stueve, & Kikuzawa, 1999; Wahl, 1999). Despite the existence of a number of demonstrably effective treatments for mental disorders, the fear of stigmatization often deters help seeking. In addition, discrimination and stigmatization may make rehabilitation difficult—especially when a history of mental illness can impede obtaining and retaining work.

Few research-based efforts aimed at reducing stigma associated with mental disorders and interventions for them have been reported in the scientific literature. The effectiveness of the occasional media campaign to reduce stigma associated with mental disorders and interventions for them remains unknown. The community visibility of some untreated or non-adherent people with severe mental illness, combined with intense media coverage of occasional acts of violence by such individuals, adds to an environment of mistrust and stigmatization. Furthermore, little is known about the nature and scope of stigma with respect to mental disorders and interventions for them within the context of racial/ethnic factors that may further impede acceptance of these disorders and access to care. Relatively unexplored racial/ethnic factors, including socioeconomic status, might influence the way mental disorders are perceived by those suffering from them and their families and alter the frequency with which available interventions are sought and accepted by consumers, as well as implemented by providers.

Basic behavioral research on perceptions of mental disorders and those suffering from them, including research on attitudes, beliefs, and prejudicial behavior toward those with mental disorders, as well as media portrayals of mental disorders and interventions for them, would inform efforts to overcome this barrier to help-seeking in public health contexts. For example, the social psychology literature has much to offer those who seek to overcome the stigma experienced by those suffering from mental disorders (Corrigan & Penn, 1999), including findings on social attribution and attitude change (Corrigan, 2000). Existing data on discrimination based on age, gender, racial/ethnic status, sexual orientation, physical disability, or medical status might provide clues about how to understand and further investigate stigma associated with mental disorders. Research on medical services utilization, for example, why certain groups of men tend to avoid preventive medical care, would also provide insight into how to investigate the reasons so many suffering from mental disorders do not seek professional care.

The role of stigma in the recognition and treatment of mental disorders in primary care settings also merits investigation. Patients may be reluctant or embarrassed to consider that a mental disorder may be an important contributor to their symptoms and instead prefer a somatic diagnosis (Schroeder, 2001). Such reluctance can make it more difficult for primary care physicians to address mental health problems. Similarly, physicians may be hesitant to raise the possibility of mental disorder with patients whose symptoms have no apparent somatic cause, because the physicians may not want to embarrass or lose patients who are not ready to consider the possibility of and treatment for them. Basic behavioral science research on how patients and physicians might be encouraged to overcome the stigma associated with mental disorders so that these problems can be openly addressed in primary care settings is needed.

Additionally, in primary care medicine, stigma associated with mental disorders may be associated with both financial and nonfinancial disincentives among physicians to recognize and treat these disorders (Schroeder, 2001). Research that helps to clarify such disincentives and strategies for overcoming them is needed. Stigma associated with mental disorders in primary care settings might sometimes be deadly: The majority of individuals who commit suicide have visited a health care provider in the months preceding their deaths (Pirkis & Burgess, 1998). Men kill themselves twice as often as women, yet are less likely than women in primary care settings to receive a diagnosis of or guideline concordant treatment for a mental disorder. Thus, research on ways to facilitate the recognition and treatment of mental disorders in these settings is imperative.

Basic Emotional Processes in Mental Disorders

As noted above, the basic behavioral sciences have much to offer public health approaches, and vice versa. For example, research on basic processes such as emotion, cognition, motivation, decision-making, social perception, and interaction can help to explain why and how interventions in real-world settings work or fail to work. To describe only one example of how basic behavioral research might improve our understanding of mental disorders and thus our ability to intervene in public health settings, we note the links between basic emotion research and research on mental disorders (Kring, 2000).

Many mental disorders, perhaps most, include an emotional disturbance (Thoits, 1985). The

disturbances span conditions first diagnosed in childhood, such as autism, to disorders most often affecting adults, such as schizophrenia. Examples include an excess of emotion in some anxiety disorders or borderline personality disorder, the deficits of emotional expression associated with both schizophrenia and depression, and the lack of social/moral emotions associated with antisocial personality disorder. Another type of disturbance is the lack of a coherent emotion response system in schizophrenia or social phobia.

Most emotion researchers agree that emotions are functional and adaptive systems, composed of multiple components, that help us to act in response to environmental stimuli and challenges (Kring & Bachorowski, 1999). Recent theoretical advances in basic emotion research have important applications for understanding emotion disturbances in psychopathology (e.g., Keltner & Kring, 1998; Kring & Bachorowski, 1999). For example, most emotion theorists agree that emotions have several components, including behavioral and expressive, subjective/experiential, physiological, and cognitive. They believe that these components operate in relative synchrony in most situations, but that psychopathology is characterized by less than optimal synchrony in certain contexts (e.g., Buck, 1994; Ekman, 1994).

Research in basic emotion has included several methodological advances that can directly benefit those interested in studying emotional disturbances in psychopathology. For example, laboratory-based paradigms and stimuli have been developed that allow researchers to study specific emotions in an experimentally controlled setting. Laboratory-based stimuli that have been developed and shown to be effective for eliciting different emotions include film clips, slides, pictures, and narratives. Laboratory manipulations have been devised to study specific components of emotion and how they shape other components. For example, participants can be instructed to alter their facial displays and the consequences of these changes can be reliably assessed (e.g., Gross & Levenson, 1993). Naturalistic methods, which allow for the examination of emotion in the context of daily life, have also been applied to research on emotion in psychopathology (e.g., Myin-Germeys, Delespaul, & deVries, 2000). Basic emotion researchers have developed reliable and valid measures of facial expression (e.g., Ekman & Friesen, 1978; Kring & Sloan, 1991), self-reported feelings (Larsen & Diener, 1992; Watson, Clark, & Tellegen, 1988), and emotion physiology (Levenson, 1992). These theoretical, methodological, and measurement advances in basic emotion

research have recently been applied to the study of emotional disturbances in ecologically valid contexts in a variety of disorders, for example, schizophrenia and major depression.

Although emotional disturbances in schizophrenia have long been noted by family members and patients, only recently have they been studied systematically. Borrowing from the methods developed in basic emotion research, Kring and colleagues found that people with schizophrenia are markedly less expressive than individuals without schizophrenia when viewing emotionally evocative stimuli (Kring, Kerr, & Earnst, 1999; Kring, Kerr, Smith, & Neale, 1993; Kring & Neale, 1996). People with schizophrenia report that they experience similar if not greater amounts of emotion than do people without schizophrenia, and at least some people with schizophrenia may show greater physiological signs of emotion than do people without schizophrenia (Kring & Neal, 1996; Kring, Triesch, Germans, Putnam, & Neale, under review). This deficit in emotion expressive behavior does not appear to be attributable to medication side effects (Kring et al., 1999; Kring & Earnst, in press) or a broader social skills deficit (Salem & Kring, 1999).

With respect to depression, evidence suggests that it is associated with increased levels of negative affect (NA) and decreased levels of positive affect (PA; e.g., Watson, Clark, & Carey, 1988). Shelton and Tomarken (in press) hypothesized that specific treatments for major depression would differentially affect PA and NA. They found that antidepressant medication (nortriptyline) was associated with a decline in depression symptoms and NA; however, only the combination of sleep deprivation and antidepressant medication was able to help individuals experience more PA. Gotlib and his colleagues are drawing upon research in cognitive science and cognitive neuroscience to identify different patterns of brain activation among different types of depressed individuals in response to positive and negative emotional stimuli.

These illustrations show the promise of basic emotion research for understanding the nature of emotion disturbances in mental disorders. Armed with this knowledge, public health scientists can be better equipped to develop effective prevention and treatment programs for various mental disorders. Basic emotion research can elucidate the symptoms of various mental disorders and thus have direct implications for prevention and treatment. For example, we now understand that the symptom of flat affect in schizophrenia does not entail a complete absence

of emotion. Rather, people with schizophrenia feel strong emotions yet do not readily display these feelings. Future behavioral and other therapeutic interventions can be designed to help individuals with schizophrenia better cope with and appropriately express emotions that might otherwise remain unknown to observers. Basic behavioral science research on emotion can help to situate the temporal course of these disturbances as well. For example, if the emotion disturbances are antecedent to the illness, prevention efforts can be developed to identify and then intervene early, perhaps to prevent the onset of the illness (Kring, 2001). Because emotional disturbances play such a central role in so many mental disorders, this area seems a particularly fruitful avenue for collaboration between basic behavioral science researchers and public health researchers.

INTEGRATING BASIC BEHAVIORAL AND PUBLIC HEALTH SCIENCE IN PREVENTION RESEARCH

There are a number of studies focused on the prevention of mental disorders that integrate basic behavioral science and public health science. The Institute of Medicine (1994) and the National Advisory Mental Health Council Workgroup on Mental Disorders Prevention Research (1998) have extensively reviewed this literature and provided a range of exemplars focused on infants through the elderly. To note just a few examples of preventive interventions aimed at mental disorders that incorporated basic behavioral science research:

- Vinokur, Schul, Vuori, and Price (2000) demonstrated that 2 years after a job-search workshop based on basic research on job-search motivation and mastery, unemployed participants experienced significantly higher levels of reemployment and monthly income, lower levels of depressive symptoms, a lower likelihood of experiencing a major depressive episode in the last year, and better role and emotional functioning.
- The Conduct Problems Prevention Research Group implemented a multisite preventive intervention aimed at conduct disorders that integrates basic research on social-cognitive and behavioral correlates of aggression and victimization in early childhood, peer relations and rejection, early attention problems, and social information processing, among other factors (e.g., Bierman, 1997).

- Clarke, Hawkins, Murphy, and Sheeber (1995) showed that a preventive intervention for at-risk high school students based on cognitive-behavioral principles reduced the likelihood of major depression in the students.
- Rabins et al. (2000) targeted older public housing residents to test a community outreach screening and referral system aimed at identifying mental disorders among residents in these settings. The screening and referral procedures were conducted by residents of the housing units. An intervention for residents identified with depressive symptoms was conducted by a psychiatric nurse in the residents' homes. At 2-years' follow-up, intervention participants had significantly lower scores on indicators of depression.

Of note in almost all these examples is the targeting of risk and protective processes that were sometimes identified through extensive epidemiological research within a public health conceptual framework and almost always followed by basic behavioral research on cognitive, emotional, interpersonal, and contextual factors. These factors, in turn, became the targets of modification through interventions aimed at reducing adverse outcomes, including outcomes associated with mental disorders and symptoms. The Institute of Medicine and National Advisory Mental Health Council Reports provide a foundation upon which future collaborative research on basic behavioral science and public health science can address the many remaining unanswered questions facing Americans suffering from mental disorders, their families, and friends.

OVERCOMING BARRIERS TO BEHAVIORAL SCIENCE/PUBLIC HEALTH COLLABORATION

Although basic behavioral scientists and public health scientists may share many values and methods and even be housed together in interdisciplinary research units, traditionally behavioral scientists and public health scientists have different educational and research values and are faced with varying professional incentives that sometimes serve as barriers to effective communication (Salovey, 2000). In this section, we note some of these barriers and describe methods by which these might be transcended.

Basic behavioral scientists often are motivated to test a theory or conceptual model and/or discover

underlying interactions among biological, cognitive, affective, or social processes that account for a health phenomenon. Real-world considerations may take a backseat to theory testing. Furthermore, for many behavioral scientists housed in schools of “arts and sciences,” undergraduate teaching may account for substantial amounts of time. Grants are written primarily to support research, provide stipends for graduate students, and cover summer salary for the investigator, although this varies considerably across institutions and settings.

Public health scientists, in contrast, are more likely motivated by real-world problems and the opportunity to demonstrate that a biological, behavioral, social, or economic variable has a direct influence on a health outcome in an ecologically relevant context. Theory testing may be less relevant. The importance of teaching may vary considerably but is often a less self-defining aspect of one’s professional identity, especially among public health scientists in medical schools (rather than in “arts and sciences”). Grant support, however, is often more critical to public health scientists, as they are often expected to cover a substantial proportion of their academic year salary with such funds, as well as support their research and graduate students.

Although efforts to foster collaborations between basic behavioral scientists are relatively few at most research institutions, some noteworthy examples exist that may provide useful guidance for overcoming these and other barriers. The Department of Clinical and Health Psychology at the University of Florida, Gainesville, for example, integrates basic behavioral science and public health science research (Rozenky, 2000). Historically, the Department’s faculty engaged primarily in efficacy research. Efficacy research examines, under relatively controlled conditions, whether a particular intervention has a specific, measurable effect and addresses the safety, feasibility, side effects, and appropriate dose levels of various interventions. Faculty in the Department studied a range of topics such as the treatment of oppositional/defiant behavior in children, adherence to medical regimes, treatment of depression and anxiety, treatment of pain disorders, and psychological factors relating to adjustment to various medical illnesses. The faculty limited their investigations to the clinics in the academic health care center, with tightly controlled, often manualized treatment protocols, with strict patient/subject inclusion criteria.

With the growing movement of professional psychology into the area of primary care and a decision

of the Department to focus on mental health issues in the rural counties surrounding Gainesville, the faculty founded one of the first rural psychology training programs (Sears, Evans, & Perry, 1998). As a natural outgrowth of the educational and services activities of the Department’s rural psychology program, investigations moved from the academic health care center into the community. These scientific activities occurred as part of both rural extension services (Sears, Evans, Craven, Kortenkamp, & Campbell, 1996) and routine psychological services in the community health clinics (Sears, Danda, & Evans, 1999). The investigators soon realized, however, that their training in stratified sampling, random assignment to groups, and rigorous specification of the dependent and independent variables was not always practical or useful in the community setting. Furthermore, it was not necessarily the optimal approach to answering some of the treatment or services system questions the faculty or the community itself wished to address. That is, the investigators needed to learn new skills to conduct effectiveness research. Effectiveness research identifies whether efficacious treatments can have a measurable, beneficial effect when implemented across broad populations and in other service settings.

To address this new training need, the faculty identified members interested in taking the courses required to earn a MPH degree or courses in the University of Florida’s PhD program in health services research. Both academic programs reside within the College of Health Professions, the college housing the Department of Clinical and Health Psychology. Both the chair of the Department of Health Services Administration (home of the two programs) and the Dean of Academic Affairs of the College supported these opportunities. Courses were scheduled to accommodate the faculty’s ongoing research and teaching responsibilities. It is noteworthy that both graduate programs require research projects as part of course work or as final projects for the degree. The faculty is currently applying for federal funding that would provide them with the time to complete the necessary course work. Pilot projects, based upon individual faculty member’s efficacy research areas, would be developed to fulfill federal funding requirements and to serve as the required MPH and services research projects. The faculty team would be augmented with postdoctoral students and other grant-supported student research assistants. The students would have the same opportunity to receive the MPH or the services research training to build a community research/public health interest within the

next generation of Department faculty and the profession. The Department would then have a cohort of senior faculty with the necessary knowledge and skills to move the entire Department in the direction of public health issues and students who will begin to carry out dissertation research integrating clinical psychology and public health.

In another example of collaboration between basic behavioral scientists and public health scientists, the University of Illinois at Chicago (UIC) has multidisciplinary research centers that each focus on interdisciplinary subject areas (e.g., the Great Lakes Center for Occupational and Environmental Safety and Health, and the Health Services Research Center). At UIC, the Health Research and Policy Centers provide an opportunity for behavioral scientists (e.g. faculty from psychology, sociology, and psychiatry) to interact and form research collaborations with faculty in public health and other health sciences (Prohaska, 2000). The success of these research centers is attributable, in part, to the Department chair and College dean's goal that the collaborative effort be advantageous to all disciplines involved in it and that it increase the possibility that grant funds will be obtained. For example, Public Health provides biostatisticians, epidemiologists, and intervention specialists, as well as assistance in applying theory developed through basic behavioral research to large-scale community settings. One of the objectives in such collaborative research settings is to provide opportunities for behavioral scientists to publish research that represents controlled-trial theory testing as well as more applied studies. Sharing the indirect costs, that is, overhead costs associated with research grants spanning more than one department, had to be agreed upon at the university level. At UIC, these are shared in proportion to the personnel costs associated with the faculty from each department. For example, if most of the faculty and staff come from the Department of Psychology, then it would get the proportion of the indirect costs associated with their effort.

Another method of fostering collaboration between the behavioral sciences and public health science is through the professional development of graduate students. At the UIC, as in many other universities, all graduate students are eligible for tuition waiver if they participate in research at least 25% of the time or 10 hr per week. Public health frequently employs students from the behavioral sciences as research assistants. Behavioral science and public health students may take courses from one another's col-

leges, and there has been a recent trend for colleges to require students to take public health courses. Furthermore, behavioral scientists no matter where they reside are often asked to be on a student's dissertation committee. Committee members and faculty from outside the candidate's college are required, and the behavioral scientists are sometimes asked to serve on public health dissertation committees and vice versa. Currently, the UIC School of Public Health has such relationships with other colleges including Nursing, Business, and Medicine.

PROBLEMS REQUIRING FUTURE COLLABORATIVE RESEARCH

A broad range of research problems, in addition to those already described, likely would benefit from approaches integrating the basic behavioral sciences and public health science. Some of these topics, as identified by the NIMH, include, but are not limited to,

- understanding basic behavioral processes (perception, memory, problem-solving, emotion, etc.) in mental illness;
- understanding how mental illnesses and their treatments affect the abilities of individuals to function in diverse settings and roles;
- understanding how social or other environmental contexts influence the etiology and prevention of mental illness and the treatment and care of those suffering from mental disorders;
- examining risk and protective processes associated with comorbid mental and physical disorders (e.g., heart disease and depression, anxiety disorders, and cancers);
- developing conceptual models supporting new interventions, and initial testing of the new interventions for comorbid mental and physical disorders;
- using principles and findings from the basic behavioral sciences to improve adherence to interventions for mental disorders; developing models of preventive, treatment, and rehabilitative interventions and innovative strategies to enhance adherence to them;
- investigating various informed-consent procedures, advance directives, and other issues in research ethics with groups at risk for or suffering from mental disorders;
- examining principles and findings from the basic behavioral sciences that bear on individuals'

willingness to participate in interventions, response to interventions, functioning/disability, and other outcomes;

- investigating how interpersonal communication styles of providers (e.g., authoritarian, egalitarian) and client preferences for particular styles interact to affect willingness to participate in interventions, response to interventions, functioning/disability, and other outcomes;
- examining approaches to decrease stigma related to mental disorders, including studies of the social context of stigma as well as studies of individuals who are stigmatized;
- using cognitive science and social cognitive principles to develop racially/ethnically sensitive public mental health messages for decreasing stigma and applying social cognitive strategies for reducing bias in health care settings;
- determining how membership in multiple stigmatized groups (e.g., minority, female, mentally ill) affects individual perceptions and perceptions of others (including health providers);
- developing and assessing, through small community-based studies, multifaceted approaches to stigma reduction through individual and combined interventions such as disseminating racially/ethnically sensitive public education materials about recognizing, treating, and preventing specific mental disorders;
- increasing positive contact between the community and persons with or at risk for mental illnesses; individual and familial interventions designed to change incorrect beliefs about the origins of mental disorders;
- encouraging adherence to treatment regimens to increase workplace adjustment and lessen the risk for violent behavior;
- fostering community awareness of effective treatment trials and linkages, as well as the effective use of outreach programs to enhance access to appropriate services by mentally ill people—including those who are homeless and those with substance abuse and HIV disease;
- examining cultural explanations for disorder and how they affect receptivity and response to interventions, particularly when the client's and family's explanations differ from those of the mental health provider.

There is funding available to support collaborative research on these and other topics. The NIMH

program announcement, "Translating Behavioral Science into Action," (<http://www.nimh.nih.gov/tbsia/tbsiatoc.cfm>) and the related program announcements on comorbid mental and medical disorders and on adherence (<http://grants.nih.gov/grants/guide/pa-files/PA-99-071.html> and <http://grants.nih.gov/grants/guide/pa-files/PA-00-016.html>, respectively) provide information about these research priorities. Perusal of these program announcements provides a sense of the promise of collaborative research between basic behavioral scientists and public health scientists. A range of problems can be addressed in novel ways if basic behavioral scientists and public health scientists can transcend the structural and historic barriers to their collaboration and work together to address these and other issues.

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