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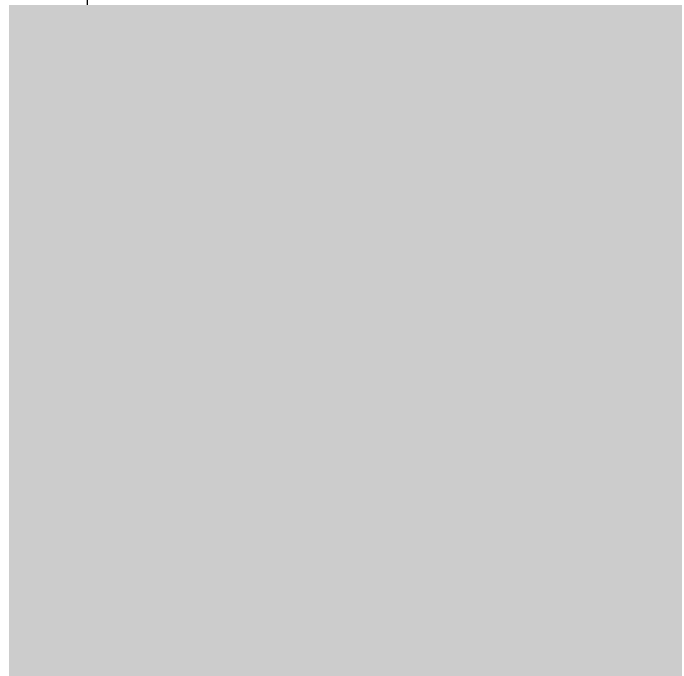
REPORT 3

## HUMAN CAPITAL INITIATIVE

# Reducing Mental Disorders

A Behavioral Science Research Plan for Psychopathology

*This is a behavioral science research initiative directed toward reducing the incidence and impact of mental disorders. It presents what is generally known about particular aspects of mental disorders and outlines what we need to know in order to make substantial progress in combating these costly and debilitating illnesses.... Seven areas of behavioral research, both basic and applied, are proposed as immediate priorities for funding.*



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# REDUCING MENTAL DISORDERS

## A BEHAVIORAL SCIENCE RESEARCH PLAN FOR PSYCHOPATHOLOGY

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# Human Capital Initiative

## Background

### Origins of the Human Capital Initiative

For the past six years, the psychological science community has been developing a national behavioral science research agenda that illustrates the potential of behavioral science research in addressing critical areas of concern to this country. The first stage of the process began in January 1990, when more than 100 researchers representing 65 psychological organizations and half a dozen federal agencies gathered in Tucson, Arizona, for what was to be the first of several Behavioral Science Summit Meetings. The number of organizations represented in later meetings grew to near 80.

Convened under the sponsorship of the American Psychological Society with partial support from the National Institute of Mental Health (NIMH), the Summit participants began by addressing this basic question: Given the array of different scientific perspectives within behavioral science, from brain research, to the study of the whole person, to social and organizational research, was there enough of a common bond to warrant a joint, large-scale research effort? The unanimous answer was, "Yes!" and the Summit participants endorsed the development of a research agenda that would help policy makers in federal agencies set funding priorities for psychological and related sciences.

The result of the first stage was the *Human Capital Initiative*, a framework for a sustained research effort published in 1992. It targets six problems facing the nation, communities, and families—Aging, Literacy, Productivity,

Substance Abuse, Health, and Violence—and describes these issues in terms of psychological research. Further details and copies of the *Human Capital Initiative* are available from the American Psychological Society, 1010 Vermont Avenue NW, Suite 1100, Washington, DC 20005-4907. (Phone: 202-783-2077; Fax: 202-783-2083; email: APS@info.cren.net)

### The Second Stage

The Human Capital Initiative (HCI) has now entered a second phase. Using the HCI document as an umbrella structure, groups of individual investigators representing their scientific societies are being brought together to develop specific research initiatives. This document is part of that series. Others have been focussed on such areas as productivity in the changing workplace, and productive aging. (Copies are available from APS at the above address.)

The six broad areas of national concern in the original *Human Capital Initiative* are not meant to limit the specific research initiatives that might come forward. Rather, they are intended to serve as starting points to stimulate research that adds to both theoretical and practical knowledge of these and other crucial issues.

The area of Health in the HCI includes research on health and behavior as well as the area of psychopathology and mental health. This document addresses the latter. An initiative on health and behavior is being developed separately.

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# A HUMAN CAPITAL INITIATIVE REPORT

## REDUCING MENTAL DISORDERS

### A BEHAVIORAL SCIENCE RESEARCH PLAN FOR PSYCHOPATHOLOGY

## Executive Summary

This is a behavioral science research initiative directed toward reducing the incidence and impact of mental disorders. It presents what is generally known about particular aspects of mental disorders and outlines what we need to know in order to make substantial progress in combating these costly and debilitating illnesses.

The personal and social consequences of disorders such as depression, schizophrenia, and many other severe mood and anxiety disorders are well known. These illnesses impose a heavy toll on the individual, the family, and the workplace. In their most serious form, they deprive their victims of the ability to live independently, resulting in chronic—sometimes life-long—reliance on the family or government programs for support.

The development of mental disorders is influenced by biological, behavioral, and social factors whose contributions vary for different disorders. People may suffer from mental disorders because of genetic predisposition, behavioral deficits, brain abnormalities, or, more likely, a combination of factors. Diagnosing and treating various disorders requires a fundamental understanding of all aspects of the basic processes that lead to psychopathology. Significant advances have occurred in these areas but much work remains to be done, particularly in investigating the factors that make individuals more vulnerable to mental disorders.

Despite the personal and social costs of mental disorders, and despite the availability of effective interventions for many of them, an estimated four of every five people suffering from mental disorders do not get treatment. The reasons range from lack of knowledge about where to turn, to the stigma that still accompanies mental illness. Whatever the reason, mental disorders continue to be an enormous liability for modern society, tragic both in human and economic terms.

**Research in Psychopathology.** Research on psychopathology is a relatively new area, but it holds great promise in the fight against mental disorders. The many subfields of psychology, genetics, neuroscience, cognitive science, biology, sociology, and epidemiology contribute to this research perspective.

The merging of these disciplines, which mirrors the constellation of factors that contribute to mental disorders, is

in itself a sign of substantial progress because it reflects the recognition that no single perspective can provide all the answers to the complex problems of mental disorders. For example: Mental disorders involve the brain, a biological organ once considered to be a domain solely of biology and related research disciplines. However, the brain is responsible not only for maintaining order in our body's biological systems; it also is the control center for behavioral functions, including all-important behaviors that serve to protect us and to allow us to grow and progress.

A purely biological perspective, one that fails to incorporate knowledge about behavior, provides a vastly incomplete picture of mental disorders. Only a biobehavioral approach, one that includes a sophisticated understanding of biology *and* behavior, can articulate the connections between genetic or pharmacological influences and the complex behaviors that we define as mental disorders. Psychosocial and other environmental influences not only alter activity in the autonomic nervous system, the neuroendocrine system, and the immune system, but they alter brain structure itself. Plasticity of the nervous system—modifying the brain by experience—can only be understood with recourse to principles of behavioral science. Thus, psychological and behavioral principles hold a central position in attempts to understand mental disorders, and they can be ignored only at the cost of a narrow and provincial approach to the topic.

### Overview of the Research Plan

This document is a strategic plan for combating mental disorders. Seven areas of behavioral research, both basic and applied, are proposed as immediate priorities for funding. Researchers from a variety of perspectives need to work together to:

- ◆ Pursue research on the **origins of mental disorders** with an emphasis on interactions that occur across psychosocial, behavioral, and biological areas.
- ◆ Clarify the **scope of mental health problems** in the United States.
- ◆ Identify the **factors that make some people more**

**susceptible** and others more resistant to mental disorders.

- ◆ Upgrade the **behavioral technology for diagnosis** and study of mental health problems.
- ◆ Continue to **evaluate treatments** and develop new interventions for the treatment and prevention of mental disorders.
- ◆ Determine individual and cultural **factors that impede access to services** for large numbers of people suffering from these disorders.
- ◆ **Invest in the infrastructure of clinical research** by training behavioral scientists for psychopathology research and developing data bases, pools of research participants, and communication systems to ensure continuing progress in the field.

### Summaries of the Plan's Target Areas

The plan's target areas for the behavioral research plan for mental disorders are summarized here and discussed in detail in the following sections. Although these are listed separately for the sake of discussion, they are all strongly connected, and all need to be addressed if we are to deal adequately with the severe problems they represent.

**Origins of Mental Disorders.** Mental disorders involve the interaction of physical, psychological, and social factors. One of the difficulties in understanding the origins of mental disorders is identifying the separate contributions of these factors. But newer quantitative techniques have been developed to separate these contributions into genetic components, environmental components that are shared within the family, and environmental components that are outside the family. These components represent the causal "architecture" of a given disorder.

With mood disorders, the most studied disorders to date, the relative contribution of these components varies remarkably across different forms and levels of severity of the disorders. Similar study is needed of other specific disorders. This kind of knowledge will provide an improved basis for future investigation of the origin, prevention, treatment, and course of disorders.

**The Scope of Mental Disorders.** Several studies have shown an astonishingly high rate of mental disorders in the adults of our society—32 percent of adults at some time in their lives, with 20 percent exhibiting debilitating symptoms within any year. Among children, it appears that these disorders occur at an equally alarming rate of approximately 20 percent. Population levels of substance abuse, anxiety, and mood disorders

are particularly alarming.

There also is a high rate of "comorbidity"—the occurrence of more than one disorder in an individual. For example, 14 percent of the non-hospitalized general population, aged 15-54, has multiple (three or more) disorders. These are usually prolonged, severe, and costly to society.

To date, people with multiple disorders have been an understudied group. In addition, major studies on the epidemiology of mental disorders have ignored childhood disorders, most personality disorders, and those stressful conditions that affect work and family but fall short of meeting criteria for a diagnosis. Inadequate data exist in many categories. A greater effort to address the scope of mental health problems will provide better bases from which to develop and test hypotheses about causes, treatment, and course of the different disorders.

**Factors That Increase or Protect Against Risk of Disorder.** We all differ in our vulnerability to mental health problems and psychopathology. Demographic factors such as age, sex, ethnicity, or occupation are associated with differential liability for various forms of disorders. Risk for depression, suicide, and conduct disorder requires closer investigation to determine instances where intervention or prevention are needed. Similarly, characteristics of the social environment that serve to reduce or increase an individual's risk for mental disorder must be more clearly identified. As one example, recent research suggests that stress—specifically, its impact on human functioning—plays a more complex and pervasive role in increasing risk for mental disorders than was previously assumed.

**Assessment and Diagnosis: Upgrading Behavioral Technology.** The clinical interview remains the gateway to assessment and diagnosis of mental disorders. In mental health research, the clinical interview and other subjective

*A purely biological perspective, one that fails to incorporate knowledge about behavior, provides a vastly incomplete picture of mental disorders. Only a biobehavioral approach, one that includes a sophisticated understanding of biology and behavior, can articulate the connections between genetic or pharmacological influences and the complex behaviors that we define as mental disorders.*

mechanisms are valuable, but they are less precise than behavioral and psychophysiological laboratory procedures and highly-refined behavioral assessment systems in the natural environment that have been developed. These latter procedures avoid the scientific shortcomings of the interview and are capable of uncovering clues to impaired functioning that are not revealed by talking to a patient. With these procedures, responses to different treatments can be more readily measured, analyzed, and predicted. In order to achieve precision in measurement, analysis, and prediction of mental disorders, a concerted effort must be made to broaden the use of these procedures.

**Intervention.** A substantial body of research shows that a variety of mental health treatments have immediate positive effects. But having effective treatments available and using them are two different things. To assure widespread use of effective treatments, support is needed to collect and catalog these procedures; to describe the populations, disorders, and conditions under which each treatment is most effective; and to communicate these procedures to mental health providers. In addition, more research is needed on long-term effectiveness of treatment and on relapse. Some research shows that relapse rates don't always correspond to short-term effectiveness. In light of the current changing health care system, "risk capital" should be reserved for the exploration of highly-innovative, cost-effective treatments which would not be investigated under traditional funding policies.

**The Underserved.** The startling finding, from demographic surveys, that four out of five adults with a recent diagnosable disorder never receive treatment has focused attention on the underserved. Even less is known about what services are provided to children. Psychosocial factors clearly affect the avenues to treatment. The nature of a disorder itself may obstruct the seeking of help. Homelessness and population mobility may also stand in the way of continuity of care. Since, by definition, the underserved are not readily accessible to research study, much is yet to be understood about the important factors that cause so many to go untreated. We need further study of personal characteristics, the family and social networks, stigma and societal biases, the role of affordability, and the cost trade-offs to society in providing versus not providing treatment.

**Infrastructure.** For a healthy progression of knowledge in psychopathology, it is important to pursue not only current priorities, but also an infrastructure for long-term development. Among the needs are career award support for mentors in psychopathology research with its various cross-disciplinary demands; the creation of a "theoretical psychopathologist" whose training would be focused primarily upon developing integrative theoretical models rather than upon project-to-project hypothesis testing; new investigators trained in the most up-to-date techniques; and the development of data sets, subject pools, and vehicles of communication for investigator interest groups and multi-site projects to be run efficiently.


## ACKNOWLEDGMENTS

***Reducing Mental Disorders: A Behavioral Science Research Plan for Psychopathology*** is the result of collaboration among representatives of numerous scientific organizations. A steering committee (the Committee on Psychopathology and Mental Health) developed a preliminary draft of this document which was expanded during a workshop organized by the American Psychological Society held in Atlanta, Georgia, on October 9-10, 1994. The document was refined by the Committee and workshop participants, and the final text circulated for review and approval of representatives of the participating organizations. Individual contributors and organizational sponsors are listed on pages 26 and 27.

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***Mental disorders involve the interaction of physical, psychological, and social factors. One of the difficulties in understanding the origins of mental disorders is identifying the separate contributions of these factors. But newer quantitative techniques have been developed to separate these contributions.***

## CHAPTER 1

# Origins of Mental Disorders

## What We Know

Mental disorders arise from biological, genetic, “innate” characteristics of an individual and from an individual’s environment and experiences. Consequently, understanding the origins of mental disorders requires a multi-dimensional approach. One such multidimensional model, termed “diathesis-stressor,” is widely used because of its integrative approach. This model recognizes the role of both genetics and experience in explaining such disorders as schizophrenia, bipolar illness, anxiety disorders, major affective disorders, and obsessive-compulsive disorders.

The relative roles of genetics, biology, experience, and environment differ for each disorder, so the general model of explanation must be adapted for each disorder. The details for any particular condition have yet to be worked out in terms of this model, and the mechanisms that interact to cause a particular disorder, whether biological or experiential, are not yet fully known. And a developmental component must also be added to the model, since almost all disorders have a delayed and variable age of onset.

**Different Disorders, Different Origins.** Research in the various categories of mood disorder is particularly advanced. For example, one of the most distinctive forms of mood disorder is bipolar disorder accompanied by severe episodes of both depression and mania. As much as 3 percent or less of the U.S. population is at lifetime risk for this disorder.

Mathematical models can be used to estimate the relative importance of genetic factors, shared factors within a family environment, and non-shared environmental factors—ones that differ for each family member—that indicate an individual’s risk of developing bipolar disorder. These models use data from research on identical twins, fraternal twins, parents, siblings, and offspring.

For bipolar disorder, genetic factors are by far the most important, accounting for 86 percent of the risk. In contrast, for major depression (with 5 percent of the population at lifetime risk for developing this disorder) the risk components are: 52 percent genetic, 30 percent shared-familial environment, and 18 percent non-shared environmental factors. The mildest form of depression, dysthymia (population risk estimated at 5 percent) displays an even more marked shift: 8 percent genetic factors, 54 percent shared-familial, and 38 percent non-shared factors.

Similar diversity of factors is likely in the other categories of mental disorders. The result of such diversity is that each variety, form, or subtype of disorder probably will require its own set of specific treatments.

We also know that learning and conditioning are involved in the impact of environmental factors in psychopathology. For example, post-traumatic stress disorder is triggered by extreme external stressors and is often alleviated by behavioral treatments using learning and conditioning techniques.

## What We Need to Know

**Architecture of Family and Unique Influences.** We need to know the causal “architecture” or structure for other forms of mental disorder at a level at least comparable to the mood disorders. This is an important area of research that has the potential to answer questions about a number of aspects of mental disorders. For example, some conditions are familial because the family shares environmental factors and experiences; some are familial because family members share the same genes; some are familial for a combination of these reasons; some are non-familial and may be traced, eventually, to exposure to idiosyncratic external stressors.

**Causal Architecture and Treatment.** Answers to questions about the complex factors that cause mental disorders will have direct implications for choosing an appropriate course of treatment. Even with mood disorders, where knowledge of causes is relatively more advanced, more knowledge is needed about the effects of alternative treatments (lithium, anti-depressant medications, psychotherapy, electroconvulsive therapy, combinations thereof) on the different components involved in each disorder.

**Causal Architecture and Predicting a Disorder.** We need to know how to identify individuals who are at risk for developing mental disorders and which specific environmental events can trigger the development of the full-blown disorder among those individuals who are vulnerable. Are there any protective factors that might intervene to reduce the occurrence, severity, or frequency of relapse of a disorder? Again, the answers to these questions lie in research on the causal architecture of each respective disorder.

**Animal Models.** Many of the hypothesized mechanisms for mental disorders cannot be investigated with humans because of limitations on studying the living brain. However, because people and animals share certain structures and functions, research on animal models of psychopathologies provide an important complement to human research.

Such research has in the past both validated as well as invalidated hypotheses about mechanisms and causal architectures for selected human mental disorders. Animal research has been especially prominent in the investigation of pharma-

ceutical compounds for treating human psychopathologies and has been responsible for much of our increased understanding of the role of stress and trauma in mental disorders, particularly in anxiety disorders such as phobias or panic attacks.

Advances in our understanding of Alzheimer's disease and certain substance abuse disorders such as Korsakoff's syndrome also have been based on animal models. There is a continuing need for animal research in advancing knowledge about mental disorders.

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***The relative roles of genetics, biology, experience, and environment differ for each disorder, so the general model of explanation must be adapted for each disorder.***

## CHAPTER 2

# The Scope of Mental Illness

## What We Know

The widespread prevalence of mental disorders and their terrible impact on individuals and society demand that we aggressively pursue solutions. What we know about the prevalence of major mental disorders in the United States, both over an individual's lifetime and within a given 12-month period, comes mostly from two sources: the Epidemiological Catchment Area (ECA) study, which is a well-known study of 20,000 individuals from five separate sites, and a 1994 nationwide sample of 8,000 adults. Both studies collected data using trained interviewers and then aggregated the data into standard diagnostic categories via computer algorithms.

The results, while overwhelming in their revelations both of suffering and of societal costs, are nonetheless underestimates. The studies did not include children, nor was data collected on most personality disorders, a relatively large category of mental illnesses. Also omitted were the multitude of distressed individuals who do not quite meet the diagnostic criteria for a mental disorder but who nevertheless have impaired functioning and need treatment.

Even with these omissions, the studies indicate that about one in three American adults experience one of the surveyed disorders during some period in their lives, and one in five had symptoms of those disorders during the previous 12 months. Other major findings include:

- ◆ Significant gender differences in the prevalence of various disorders (for example, 35 percent of males meet criteria for a substance abuse disorder over their lifetime, compared to 11 percent of females);
- ◆ A new estimate of the prevalence of "non-affective psychoses," a category of severe mental illness which includes schizophrenia, indicating that 7 of every 1,000 persons suffers from such disorders during their lifetime;
- ◆ A high prevalence of comorbidity, which is the occurrence of more than one disorder in an individual. In one of the studies, 13 percent of those

surveyed had two disorders, and 14 percent had three or more disorders. This latter group accounted for 59 percent of all detected disorders of lifetime duration, and they accounted for 90 percent of all severe disorders of at least a 12-month duration diagnosed in the entire sample.

- ◆ The enormous economic costs of these disorders. We also know that the costs of mental disorders are within the range of costs associated with cancer and heart disease. For schizophrenia, direct costs are estimated at \$19 billion. Indirect costs, including suicide and lost productivity of patients and their family care-givers, adds another \$46 billion. Comparable cost estimates for manic-depressive disorder indicate a total of \$45 billion.

## What We Need to Know

**Using the Data We Have.** As noted above, existing epidemiological data tell us a great deal about the scope of mental disorders in this country, but there are things they do not show us. To accurately understand the prevalence of these conditions, these specific questions must be addressed:

- ◆ Can the data be generalized to the total population?
- ◆ When can the data be translated into hypotheses concerning etiology, risk modification, or prognostic significance?
- ◆ What are cost-efficient approaches to intervention and prevention? (For example, a tremendous savings in health care costs could result from studying the "comorbidity" group, the 14 percent of people who are affected with multiple prolonged and severe disorders, if resulting effective treatments for that group could reduce those mental disorders with a lifetime duration.)

**Acquire the Data We Do Not Have.** Many topics were omitted from the prevalence studies described earlier. To fill these gaps in knowledge, we need studies on the epidemiology of: childhood disorders;<sup>1</sup> the full range of personality disorders; and the job productivity and other problem areas experienced by distressed individuals who fall short of full psychiatric diagnosis.

<sup>1</sup>Some of the data needed on childhood disorders will be collected in a study of 19,000 children currently being planned by the National Institute of Mental Health.

***[A]bout one in three American adults experience one of the surveyed disorders during some period in their lives, and one in five had symptoms of those disorders during the previous 12 months.***



## CHAPTER 3

# Factors Influencing The Risk of Mental Illness

## What We Know

Individuals vary in their vulnerability to mental disorder. In part, vulnerability is a function of a person's social context and experiences. Characteristics of the individual also play a role. Behavioral science has provided clear leads on the factors that determine vulnerability to mental disorder.

**Demographic and Psychosocial Risk Factors.** Four factors have been shown time after time to be associated with vulnerability for mental disorder: socioeconomic status, family stability, gender, and ethnicity.

**Socioeconomic status (SES)** is related to a broad range of disorders in both children and adults. Higher rates of depression, psychosis, adjustment, and anxiety disorders are found among those with low incomes and limited educational backgrounds. It appears that the myriad of stressors associated with low socioeconomic status—things like inadequate housing, dangerous environments, and financial uncertainties—increase the risk for mental disorder. Individuals who are economically disadvantaged also are limited in their access to resources that can buffer the effects of stress. In turn, the resulting mental disorder can compromise academic and occupational performance. Thus, many patients experience a downward spiral in socioeconomic status as a result of their disorder.

Another thing we know is that the rates of certain mental disorders vary among **ethnic groups** in the United States. For example, ethnic minorities are at increased risk for a variety of mental health problems. This is not surprising, given that a disproportionate number of ethnic minorities have lower socioeconomic status, and also given the known link between SES and mental disorder. Further, as discussed later in this report, cultural barriers limit access to mental and social services for ethnic minorities.

Research also has shown that **family conflict and disruption** are linked with increased risk for mental disorder in both parents and children. Several recent studies have shown that over the past decades, depression is beginning at an earlier age—more children are receiving treatment for depression than ever before. This may be due to the decline in family stability that has been documented during the same period. Further, the effects of the decline in family stability are often compounded by economic strain and exposure to unsafe neighborhoods.

Although researchers have known about the relation between **stress** and mental disorder for many years, it is only recently that the intervening mechanisms have been studied.

The results indicate that stress can have both transient and permanent effects on central nervous system functioning. Extensive research on animals has shown that repeated exposure to even mildly stressful experiences can result in changes in brain structure and biochemistry that persist throughout the animal's life. Stress exposure can reduce the immune response and alter the animal's capacity to recover from subsequent stress. On the other hand, exposure to enriched physical environments can enhance brain growth and function.

Studies of the biological consequences of stress on humans have been less common. Yet, the data that are available suggest that we respond to stress in a manner similar to animals; our immune responses are reduced and our brain biochemistry changes. Such changes may contribute to the negative effects of psychosocial stress that may in turn result in disorders of depression and anxiety.

There are pronounced **gender differences** in the rates of several mental disorders. Women experience depression and anxiety at disproportionately high rates. This difference first becomes apparent in early adolescence. Eating disorders, such as anorexia, usually also have an adolescent onset. By adulthood, females with these disorders far outnumber males. It appears that both environmental and biological factors contribute to the increased rates of these disorders in women. Further, because disorders such as depression are associated with developmental problems in children of depressed mothers, the higher rate of certain mental illnesses in women has broad social implications.

In contrast, males—as well as having greater risk for antisocial, alcohol, and drug problems as adults—are at increased risk for certain disorders in childhood. Rates of autism, conduct disorder, and attention deficit disorder are much higher in males than females. Although the reason for gender differences in these disorders is unknown, both environmental and biological factors appear to play a causal role.

**Biological Stressors and Inherited Vulnerabilities.** Biological 'vulnerability' to mental disorder can result from early injuries to the brain. Prenatal and perinatal complications can produce central nervous system damage that has a broad range of implications for psychological functioning. Exposure to obstetrical complications has been linked with such disorders as autism and schizophrenia, as well as developmental delays in several cognitive functions.

It is also established, as noted earlier, that hereditary

factors play a role in many mental disorders. Inherited vulnerabilities are especially important in the etiology of schizophrenia and certain mood disorders. These inherited vulnerabilities likely involve complex interactions among many genes rather than the action of a single gene.

Psychosocial and biological stressors appear to act in complex ways to bring about the expression of genetic vulnerabilities. This means that specific types of mental health problems may be precipitated by multiple risk factors acting in concert.

**Attentional, Motor, and Psychophysiological Risk Indicators.** Attentional, psychophysiological, and motor factors also have been identified as indicators of risk for mental disorders. Behavioral scientists have found that children later diagnosed with mental disorders have more difficulty on tests of auditory and visual attention. Similarly, individuals who show atypical brain wave reactions to visual and auditory signals appear to be at greater risk for mental disorders.

In the area of motor functions, several longitudinal studies have revealed that early delays and abnormalities in motor development are associated with deficits in childhood social adjustment. Children with motoric abnormalities also show increased rates of mental disorders as adults. The relation between motor development and mental disorders probably

reflects an underlying central nervous system abnormality in these children.

**Cumulative Effects of Risk Factors.** In the real world, risk factors tend to occur together, and they can have a cumulative negative effect. For example, children who have a biological parent with mental disorder may be at both genetic and environmental risk. Similarly, infants who experience obstetrical complications are at especially heightened risk for adjustment problems if they are reared in an impoverished environment (and babies born into impoverished environments are more likely to have obstetrical complications).

**Protective Factors.** Supportive social, academic, and occupational environments have a positive impact on the mental health of both children and adults. Research has shown that qualitative aspects of the school environment are associated with the academic performance and adjustment of children. Similarly, positive peer relations and adequate parenting are associated with good adjustment in school, a healthy self-concept, and feelings of mastery or control over one's environment. And these factors are associated with good psychological health and adjustment.

Stable, supportive family environments (and community settings that support families) temper the long-term effects of mental disorders. In the case of severe mental disorders such

*Individuals vary in their vulnerability to mental disorder. In part, vulnerability is a function of a person's social context and experiences. Characteristics of the individual also play a role. Behavioral science has provided clear leads on the factors that determine vulnerability to mental disorder.*

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as schizophrenia, it appears that relapse can be prevented or delayed by providing supportive social environments.

Characteristics of the individual can also serve as buffers against stress and its damaging effects on mental health. For example, an easy temperament, an internal locus of control, and good social-cognitive skills can aid the individual in coping with stressful experiences.

**Prevention.** Preventive interventions aimed at reducing risk factors and promoting protective factors have provided promising results. The developmental course of children at risk for delinquency and substance abuse can be altered by intensive preventive programs that help parents develop better child-rearing skills. Programs aimed at enhancing interpersonal problem solving skills have also shown promise. Finally, psycho-educational programs aimed at enhancing the emotional quality of the family environment and the family's understanding of mental illness may afford some protection against further episodes in persons with a history of mental disorder. We will not dwell on prevention issues here, except to commend two recent comprehensive reports on preventing mental disorders: the National Academy of Science's Institute of Medicine report, *Reducing Risks for Mental Disorders: Frontiers for Preventive Intervention Research*; and the National Institute of Mental Health report, *The Prevention of Mental Disorders: A National Research Agenda*.

### What We Need to Know

**Mechanisms.** Much of what we need to know about risk factors and protective factors concerns their mechanisms of effect—how they work. On the descriptive level, we need to explain the behavioral pathways that are the intermediaries between various risk factors and poor outcomes. This will require longitudinal research on the development of children at high risk for mental disorders. One important question to be addressed is whether there are critical developmental periods for specific risk and protective factors. Also, can mental disorders be predicted with more accuracy if both risk and protective factors are involved in the equation? And, is there even greater prediction if that is combined with descriptions of biological, cognitive, and behavioral factors?

**The Life Course of Disorders.** We need to know more about the life course of specific mental health problems and, in particular, more about the complex interplay among the various systems surrounding the individual (e.g., family, home, school, community). Which patients are at greatest risk for further episodes of mental disorder? What environments are best for persons with mental disorders? Longitudinal research using sophisticated developmental and contextual models will be required to address these issues.

**Interaction of Multiple Variables.** Given the evidence that acquired and inherited vulnerabilities interact with external stressors in determining mental health outcomes, future research must focus on clarifying these complex interactive processes. What triggers mental disorders in constitutionally vulnerable individuals? Or, what inhibits the expression of genetic or acquired liabilities? Behavioral genetics research holds great promise for addressing some of these questions. For example, studies of twins and longitudinal research on adopted children (partially separating genetic and environmental factors) can shed light on the direct and interactive effects of biological vulnerabilities to mental disorders.

### Biological Consequences of Psychosocial Stress.

Greater attention is needed on the biological consequences of psychosocial stress. Some of the critical questions to be addressed are: In what ways does exposure to stress alter the human immune system response and brain biochemistry? How do people vary in their biological response to stress, and what clues might this offer to understanding vulnerability? What factors determine whether the biological consequences of stress exposure will be transient versus long-term? Are there critical aspects of environmental stress, such as its predictability or controllability, that mediate its effects? Can programs aimed at enhancing an individual's capacity to use coping strategies reduce the effects of stress?

Answering these important questions will require collaborative investigations that employ a variety of research methods and draw upon the talents of many behavioral scientists. Because recent advances in neuroscience have provided more sophisticated techniques for *in vivo* studies of brain function, future investigations can employ more comprehensive designs that simultaneously measure biological and behavioral responses to stress.

**Preventive Interventions.** Much remains to be known in the area of preventive interventions. As noted in the report from the National Prevention Conference sponsored by the National Institute of Mental Health, basic research on risk and protective factors should inform the design of preventive interventions. Knowledge of specific risk and protective factors should guide the development, implementation, and evaluation of such interventions.

**Given the evidence that acquired and inherited vulnerabilities interact with external stressors in determining mental health outcomes, future research must focus on clarifying these complex interactive processes.**



## CHAPTER 4

# Assessment and Diagnosis: An Upgrading of Technology

## What We Know

The accurate assessment and diagnosis of mental disorders plays a crucial role in several interrelated activities, including:

- ◆ **classifying** disorders;
- ◆ **determining the scope** of mental disorders;
- ◆ **understanding the processes** that lead to psychopathology;
- ◆ **identifying effective treatments**;
- ◆ specifying factors that help in **maintenance of treatment gains**; and
- ◆ establishing effective means of **preventing mental disorders**.

Since the initial use of formal diagnostic systems for mental disorders in the late 1800s, researchers and clinicians have relied almost exclusively on interview procedures. These interviews are typically conducted with the patient and, when possible, with family members or others who know the patient.

The clinical interview will continue to be indispensable in mental health. It is central to the relationship between patient and mental health caregiver. However, using the clinical interview as the sole basis for understanding and monitoring a patient's status over time presents problems in developing a science-based understanding of a given disorder.

More than 20 years ago, clinical researchers increasingly found that clinicians were disagreeing in their clinical judgments, a phenomenon commonly known as “interobserver unreliability.” At the same time, important advances were made in specifying “operational” or standardized criteria for diagnosing a disorder. Today's more careful distinctions among various expressions of mood disorders is one good example. Since 1980 these criteria have been incorporated in formal diagnostic systems (now exemplified by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) and the International Classification of Diseases, Tenth Edition (ICD-10)). Using these criteria, interviewing procedures have become more structured and standardized in terms of reliability. But these advances in the clinical interview process have also made even more apparent the basic flaws in the clinical interview system itself, as described below.

Meanwhile, basic behavioral science has made great strides in the fields of psychometrics, psychophysiology, behavioral assessment *in situ*, and laboratory-based assess-

ment procedures. Here are a few examples:

Advances in **psychometric theory** have resulted in reliable and valid measures of intelligence, achievement, motor performance, and objective personality functioning. These advances have also led to the development of sound psychophysiological measures of various emotional states (e.g., anxiety, anger, depression) and to the refinement of systematic behavioral assessment procedures to capture the patient *in situ*, that is, in his or her own environment.

**Laboratory-based tests** have been developed for assessing various aspects of attention, expressive and receptive language, abstract reasoning, semantic organization (conceptual structure), and the encoding and decoding of emotion. As just one example, using the time delay that occurs in an individual's response to certain items on a personality inventory (such as the widely known Minnesota Multiphasic Personality Inventory—MMPI) increases the validity of a diagnosis beyond the traditional “counting” of the number of items which match a given personality dimension.

Other on-line **computer technology** now allows split-second timing and control of events under study. This technology has been brought to bear not only on the recording and analysis of a patient's behavioral and psychophysiological responses, but also upon varying parameters either separately or in conjunction with a person's motor response or even a person's autonomic reaction to an environmental event.

Even in the **interview and therapy** room, real-time analysis and feedback of the “floating time frame” (i.e., the most recent 10 seconds) can reveal important minute changes in the patient's verbal response, in significant autonomic functioning, or in other parameters.

In short, a body of knowledge about human functioning has evolved independent of both traditional diagnostic interview procedures and laboratory advances in brain biochemistry. As a result, more sensitive and accurate “biobehavioral” and contextual approaches are available for assessment. Unfortunately, these approaches are not being effectively applied in diagnosing mental disorders.

## What We Need to Know

During the time the above advances were being made, the area of diagnosis of mental disorders fell behind other health sciences in terms of technological and scientific development. This may be due in large part to a continued reliance on data that is vulnerable to distortion because it is not objective, either because of biases in the source of the information—the patient, family, or caregivers—or in the person using the

information to make a diagnosis. To put it another way, the data domain—what we look at to make a diagnosis—has not expanded much beyond the verbal domains of the clinical interview and retrospective reporting, which are essentially the same approaches as established in the late 1800s. This is true despite the increasing number of deviant phenomena identified in biobehavioral laboratories and through naturalistic behavioral assessment systems, which cannot be observed in the interview room.

Technological and psychometric advances in managing data for diagnostic purposes have been achieved. Advances such as precise millisecond- and state-contingent control of an event and the measurement of a patient's response; accountability for contextual influences; on-line computer analysis of state (as well as trait) features; examination not only of interobserver reliability but also the stability (e.g., epochs) of malfunctioning across time; and relating diagnostic data to decision-specific clinical validity criteria are all now things that can be done. But they are not yet generally a part of modern-day clinical diagnosis.

Despite their power to improve clinical diagnosis, these revolutionary technologies are not yet widely used, possibly because they represent a departure from the interview-based tradition on which so many clinicians and scientists rely. We believe that the advances described above must be applied whenever possible because of their potential to significantly increase our knowledge of the causes, treatments, and prediction of mental disorders beyond what can be gleaned from interviews alone. It is likely that a combination of the two will provide the best insights into diagnosing mental disorders.

#### **Overcome the Limitations of the Clinical Interview.**

The usefulness of the clinical interview in making a diagnosis is limited by the inevitable variations in information provided by the patient about the precipitants, the symptoms, and the course of their disorder. Patients are asked to report on their current and past moods (i.e., depression, manic episodes); the nature of their perceptual experiences (i.e., hallucinations); and the content of their thoughts (i.e., negative self-attributions, delusional beliefs). The problem is, patients' recollections and descriptions of their symptoms change over time and context, and symptoms reported in one interview may not be reported in another.

Such problems are compounded in the assessment and diagnosis of a child or adolescent, especially for acting-out, resistant, or attentionally-disordered children. Moreover, the reports of mothers and fathers often conflict regarding the presence or absence of certain symptoms or problems, as do the reports of parents versus teachers. At the other end of the lifespan, the elderly may have organic memory problems which complicate the normal vicissitudes of reporting one's current and past symptoms and experiences.

Apart from problems of verbal recall, variations in information also result because symptoms can change over time in the course of a disorder, or the situational and related contextual influences at the time of a given interview can lead to markedly different information being reported.

A less-acknowledged problem is the fallibility of clinicians in performing the diagnostic work. Clinicians can be influenced by pre-existing conceptions regarding a particular psychopathology (e.g., that depression occurs more frequently in females and antisocial personality disorders occur more in males) and as a result can be more likely to "observe" and diagnose certain disorders in particular patient groups. They might also employ short-cuts or "heuristics" in making judgments about their inferences and misdiagnoses. This is not a criticism of clinicians *per se*, but it shows the need for objective scientific data.

**Improve Research Planning and Review.** A major revolution in research planning is needed to determine how an expanded behavioral science data domain, and a more technologically sophisticated way of assessing it, can overcome this status quo which has existed for several decades.

"Expanding the data domain" is another way of saying we need to expand the kinds of information that are brought to bear in diagnosing mental disorders. This can be accom-

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***Behavioral psychopathology has the potential to identify the direct links between symptoms, such as a given thought disorder, and the neurotransmitter or other brain event with which those symptoms are correlated. Currently, little is understood about such links.***

plished through the use of technically precise measurements. We also know that even when the data are sound and diagnoses are maximally reliable, different diagnoses typically fail to predict future functioning, or even the effects of different treatments. Too often, diagnoses serve only the purpose of designating eligibility for third-party payments for mental health care.

Behavioral psychopathology has the potential to identify the direct links between symptoms, such as a given thought disorder, and the neurotransmitter or other brain event with which those symptoms are correlated. Currently, little is understood about such links. However, the treatment of behavioral psychopathology research in scientific peer review systems threatens progress toward this goal. Too often, behavioral psychopathology is grouped either with clinical research or with brain research; seldom is it recognized as a separate category. True, behavioral psychopathology is connected to both areas, but when it is grouped with solely clinical or biological research, its inherent value is diminished. There must be greater recognition of behavioral psychopathology as a modern, interdisciplinary, and independent field of study so that a more balanced and accurate “biobehavioral” and contextual approach to diagnosis can be attained.

**Improve Prototypes.** Numerous variables—things like backward masking, reaction time crossover—that have been identified in behavioral and psychophysiological laboratories have already been shown in small studies to be sensitive correlates of etiology, treatment effect, or outcomes. These variables need systematic investigation and “fine tuning.” Too often, studies have been directed solely to determining how a highly-sensitive laboratory variable correlates with its less reliable “cousin” variables from the clinical interview (i.e., lexical priming differences between someone diagnosed as schizophrenic and normal individuals). Less attention (and less research funding) has been devoted to making prototypes of biobehavioral measures more efficient. In other words, limited resources have meant that newly identified and promising biobehavioral measures have been left in their primitive states without the chance for refinement toward clinical applicability.

**Investigate Ongoing Versus Episodic Vulnerability.** Laboratory variables fall into categories of symptom-linked (deviant only during episodes of illness); mediating vulnerability-linked (exacerbated in an illness episode, but also deviant beforehand); and more rarely, vulnerability-linked (already deviant prior to disorder, and unchanging through episodes or relapses). Systematic investigation is needed to provide a broader spectrum of laboratory variables in terms of these properties.

**Increase Research on Developmental and Aging Factors.** Developmental factors have enormous implications for technological developments in assessment and diagnosis. Little is known about how development affects diagnostic indicators from infancy and childhood through adolescence. For example, why do certain early childhood motoric indicators of later pathology “go underground,” becoming invisible during adolescent years? More is known about mature adulthood, but less is known about how the elderly respond to the biobehavioral indicators. These are critical questions for behavioral science research in mental illness.

**Use Behavioral Technology in Treatment Monitoring.** Behavioral technology has the potential to revolutionize the clinical investigation of pharmaceutical and psychosocial treatments. The clinical effects of these treatments now are detected only after considerable lag time. Since the effects (both beneficial and negative) can be detected much earlier with behavioral technology, there could be a significantly shorter turnaround time in developing new and better alternative interventions.

**Tailor Treatment.** Ideally, treatments of mental disorders—whether pharmacologic, psychotherapeutic, or some combination thereof—should be tailored to the individual needs, traits, and states of the patient. We should know in advance who will respond to a given treatment, as well as who will be resistant, and why. And, we should know in advance what treatments have short-term, but not long-term, benefits and vice versa. An increased investment in research on the behavioral science of diagnosis will bring the time closer when this will be a reality.

***A major revolution in research planning is needed to determine how an expanded behavioral science data domain, and a more technologically sophisticated way of assessing it, can overcome this status quo which has existed for several decades.***



## CHAPTER 5

# Intervention

## What We Know

The importance of intervention lies not only in what works best to relieve someone's suffering. It also lies in increased knowledge about the disorder itself, and in the benefits to those who are dealing with the burden of care.

Knowledge has exploded over the past two decades concerning the effectiveness of psychological and biological interventions for mental disorders. We are now at the promise of identifying and disseminating empirically validated treatments.

The body of literature is so large that hundreds of reviews of outcome studies have been published. A recent report summarized the findings of 156 independent quantitative reviews (known as "meta-analyses") of psychological, educational, and behavioral treatments, which in turn summarized 9,400 outcome studies involving more than one million subjects. The report overwhelmingly demonstrates that interventions work.

The positive quantitative results from meta-analytic reviews do not justify complacency. Many questions remain: what is the degree of clinical significance of these interventions; which interventions work better than others; and how do we best match persons to interventions?

To answer these questions, some task forces have begun to catalogue specific clinical interventions that have been validated for specific mental health problems. One group has identified psychological treatments that have shown superiority over other treatments for specific problems. Each treatment involved clear manuals and well-specified clinical populations in at least two published outcome studies conducted by different, independent investigators. Treatments specifically identified as effective include cognitive-behavioral therapy for panic disorder, cognitive therapy for depression, interpersonal therapy for depression, and family education programs for schizophrenia.

## What We Need to Know

**Cataloging and Communicating Effectiveness.** We must increase our ability to specify which clinical interventions are effective for which mental disorders and in which kinds of people. More support is needed for extending and cataloging validated treatment procedures in terms of population demographics and specific disorders.

Effective treatments for many problems are available, but practitioners are often unaware of, or reluctant to use, new treatment strategies. A plan of effective communicating and training should be funded so that current information can be available to both consumers and mental health professionals.

**Identifying Critical Elements of Change.** While in some areas there has been rapid progress in developing effective treatments, in many other areas, such as schizophrenia and personality disorders, problems are still resistant to treatment. Even when effective treatments are available, little is known about the critical elements of change that occur in the process of successful treatment.

The development of new treatments will require more theoretically based research on the ingredients of change, whereas most current research has focused more simply on comparing the outcomes of different treatments. A better understanding of the process of change (both in and out of treatment) should result in new treatments or improved versions of existing treatments. We need to recognize that support for new treatment is a high-risk activity. But without increased support, investigators are likely to choose the more conservative strategy of evaluating existing treatment packages.

**Improving Cost Effectiveness.** Increased emphasis is being placed on the health care system to deliver treatments in more cost-effective ways. In mental health, more research is needed on innovative and cost-effective modes of treatment. Specifically, research is needed on new brief treatments (not just briefer versions of longer treatments), group treatments, treatment provided by peer counselors and paraprofessionals, the effects of "naturalistic" placement in normal households and neighborhoods, and assessment and treatment that are facilitated by community-wide, media-based delivery, or even interactive computer systems.

**Enhancing Long-Term Success.** Many forms of psychopathology are chronic and follow an episodic course. Although most types of mental disorder respond positively to treatment, patients often relapse after showing an improvement in their condition. What can be done to enhance the long-term efficacy of treatment programs and continuity of care? What can be done to minimize relapse after successful treatment?

Little is known about the long-term impact of interventions for those who have been treated successfully. What is the difference between patients who relapse and those who do not? For those who relapse, we do not know enough about how to predict the time and circumstances of relapse. We need to be able to identify factors that are associated with relapse. These may include environmental events (psychosocial stressors), interpersonal factors (social support, coping skills), patient characteristics (emotional responsiveness), and comorbid conditions (personality disorders, depression)

among many others. Future studies will need to focus on individual patient characteristics and their role in predicting relapse, as well as on differences in relapse rates.

**Understanding After-Effects of Disorder.** As patients are followed into the period of recovery, we also will need to learn about the psychological consequences of experiencing a mental disorder, and how those consequences affect coping. For example, in depression this consequence has been referred to as “scarring,” and it refers to the impact on a person’s ability to adjust after going through a period of severe depression. This research has been conducted for adults and for adolescents, with different results, suggesting that disorders may have differing impacts at various developmental points.



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*Knowledge has exploded over the past two decades concerning the effectiveness of psychological and biological interventions for mental disorders. We are now at the promise of identifying and disseminating empirically validated treatments.*



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*Effective treatments for many problems are available, but practitioners are often unaware of, or reluctant to use, new treatment strategies. A plan of effective communicating and training should be funded so that current information can be available to both consumers and mental health professionals.*

## CHAPTER 6

# The Underserved: Barriers to Access

## What We Know

Many people who suffer from mental disorders do not receive professional services. Results from a recent national study found that less than 40 percent of adults who reported experiencing a mental disorder during their lifetime ever received professional treatment, and less than 20 percent of those with a recent disorder had been in treatment during the past 12 months. What evidence there is regarding childhood disorders points to similar patterns. Only 13 percent of youths with at least one form of mental disorder received mental health services during the year they experienced the problem.

**Contributing Factors.** Certain demographic, geographic, and socioeconomic factors are associated with the under-utilization of services:

- ◆ Children, adolescents, and the elderly are less likely to receive treatment than other groups.
- ◆ Ethnic minorities are also underserved, and they drop out of treatment at faster rates when services are delivered by members of the dominant culture.
- ◆ People living in rural areas are less likely to have access to mental health services, since services are concentrated in urban areas.
- ◆ Although urban poor and poorly educated people live where there are services, they are less likely to seek them out, in part because they cannot afford them or do not see them as solutions to their problems.
- ◆ Some of the factors that increase risk for depression in women may be the same factors that limit their seeking treatment. These include lack of involvement in an intimate relationship with another adult, not being employed outside the home, having several young children at home, taking care of a loved one with dementia, or caring for a severely ill spouse. Similar circumstances may interfere with access to treatment in other types of mental disorder.
- ◆ The homeless mentally ill are far less likely to receive continuous, well integrated care.
- ◆ People with other disabilities, such as people in wheelchairs, those who are deaf, or those with other disabilities, may be less likely to receive treatment if they also develop a mental disorder.

## What We Need to Know

**A Search for Reasons.** We need to identify specific problems that lead to under use of interventions by different groups. We also need to know whether failure to seek treatment is caused by fundamental resistance to given

treatments or the pursuit of alternative interventions. We need to know how various demographic and socioeconomic factors interact with specific mental disorders to interfere with access to treatment. Are specific forms of psychopathology more likely to go untreated? What is the cost to society?

Another issue is comorbidity (the presence of more than one disorder). For example, confrontation and disclosure are often treatments for alcoholism, but just the opposite is emphasized for people with schizophrenia. What are the implications for those many individuals with both disorders? On another topic, people who have substance abuse disorders as well as depression may be less likely to receive services than people who have depression alone. We need to know whether severity of disorder influences whether someone receives professional treatment. Are those who do not receive treatment more severely ill than those who do?

**Understanding the Barriers: Attitudes.** Further understanding is needed of the many barriers to receiving treatment. How do individual differences play a role? It may be that the perception of a cultural mismatch with the caregiver or agency is a factor in whether a person pursues treatment. Yet, depending on the structure of the intervention, such a factor may or may not be relevant to the success of the intervention.

Another attitudinal factor concerns commitment to change. For example, the degree to which addicted individuals are committed to changing their behavior influences the effectiveness of interventions. So, different interventions may be necessary for individuals who are just beginning to contemplate change versus those already strongly committed to change. We need to identify more clearly those factors associated with refusal to enter, early drop-out, or resistance to respond, so that treatment could be more effectively matched to individuals.

**Understanding the Barriers: Family and Social.** One's family and social network in some cases may maintain barriers to treatment. Changes in the family may be necessary to accomplish and maintain changes in the individual. This point is illustrated by the success of psycho-educational treatments for families of people with schizophrenia. Recent research emphasizes the treatment- and cost-effectiveness of psycho-educational intervention for groups of families meeting together. Further, many interventions require changes in psychosocial behavior that must be sustained over long periods of time. Without family and social support, these programs often are less effective.

**Understanding the Barriers: Stigma.** A likely barrier to treatment is the societal stigma associated with being diagnosed and receiving treatment for a mental disorder. Sources of stigma are pervasive as patients and their families, caretakers, and friends face problems in housing, employment, insurance, negative media images, and so on. Are courts or health professionals biased in terms of who they refer for mental health treatment? Do past unsatisfactory experiences with treatment represent a major reason for not seeking or accepting services?

Methods for confidential assessment and feedback in a non-treatment environment may help to reduce barriers. We need to know whether self-help methods, such as self-assessment books or computer programs, could be used to increase access to appropriate treatment without increasing the harmful effects associated with misdiagnosis or inadequately implemented self-help procedures.

**Understanding the Barriers: Affordability.** A substantial barrier to treatment is whether treatment is affordable. Public policy about the financing of mental health services and identifying the cost-effective ones may influence both access to, and quality of, care. We need to know more about the consequences on quality of mental health care of different methods of organizing and financing it.

**Identifying Costs and Risks of Not Treating Disorders.** We need to know whether interventions that are effective when individuals readily seek treatment are equally effective with those who avoid treatment. What are the costs to society—in health care, welfare, and judicial process, and prison—of not treating, as compared to treating mental disorders. We need to know more about the risks associated with leaving various types of mental disorder untreated. Risks should be evaluated not only in terms of the person's health, but also the health and quality of life of family members, friends, and the society as a whole.

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***We need to know how various demographic and socioeconomic factors interact with specific mental disorders to interfere with access to treatment. Are specific forms of psychopathology more likely to go untreated? What is the cost to society?***

## CHAPTER 7

# Investing in the Infrastructure

**Research Career Awards for Mentors in Psychopathology.** Current research training along traditional professional lines has failed to provide much-needed research skills in psychopathology. Few training programs are designed to equip predoctoral or postdoctoral students to participate in interdisciplinary research teams involving psychiatry, genetics, neuroscience, neuropharmacology, brain imaging, social psychology, cognitive psychology, developmental psychology, epidemiology, sociology, and anthropology.

Postdoctoral fellowships—in which newly graduated PhDs work under an established scientist who serves as a mentor—are an especially cost-effective way to invest in knowledge and skills in related areas. Although mentors exist who could foster such skills, there is no specific support that would allow these professors to focus their efforts in developing such programs.

A “Research Career Awards for Mentors in Psychopathology” program would help ensure continued progress in the fields of psychopathology and mental health by establishing a stable future for psychopathology research, and would also serve as a hub for cross-disciplinary training and sabbaticals.

**The Theoretical Psychopathologist.** A “new breed” of psychopathologist is needed—parallel to the theoretical

physicist and theoretical mathematician—to accelerate further the advancement of knowledge in psychopathology. This “theoretical psychopathologist” would be trained to connect the knowledge from human psychopathology, neural science, mathematical models, linguistics, cognitive science, and psychology. Such individuals would help bridge the various disciplines that now tend to work either separately or inefficiently in collaboration.

**Master Databases.** Cost-efficient and idea-efficient research requires the development of “master data bases” and “multi-site clinical research populations.” It is important that such national (or international) resources be carefully planned so that they meet the quality standards and goals of researchers, and that they provide the freedom to pursue highly innovative or new hypotheses while at the same time providing a base of information for relating new variables to traditional variables in the field.

**Central Data Depositories.** All scientists benefit from the Library of Congress, the National Library of Medicine, and university libraries. Such institutions need to be developed as sites for depositing of data sets, so that re-analyses and meta-analyses can be conducted at remote sites at low cost via electronic access to well-characterized data.

## Epilogue

In the previous pages, national experts from a wide range of scientific perspectives have assessed the current state of knowledge in behavioral research on psychopathology and mental health. They have identified some of the most promising and most needed areas of additional inquiry. What distinguishes this document (and others developed under the Human Capital Initiative) from the typical “state of the field” report is its emphasis on a national concern—in this case, the incidence and prevalence of mental disorders. Specific targets have been established for future research initiatives and for developing the scientific capacity to pursue them, all in the interest of ameliorating the individual suffering and social costs created by these debilitating diseases.

This behavioral science research plan for psychopathology is intended as a guide for policy makers, both legislative and executive branch. The U.S. Congress has supported the overall Human Capital Initiative process from its beginning and several federal agencies have been instrumental in the development of this and other HCI reports.

The human and economic impacts of mental disorders warrant a comprehensive, interdisciplinary research effort on those conditions. This plan shows how the field of psychopathology research is ready to mobilize on a number of fronts, and we urge its immediate use in policy decisions about federal priorities in science and public health.

# REDUCING MENTAL DISORDERS

## A BEHAVIORAL SCIENCE RESEARCH PLAN FOR PSYCHOPATHOLOGY

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American Psychiatric Association	Society for the Advancement of Social Psychology
American Psychological Association including:	Society for Education and Research of Psychiatric Nursing
Div. on Health Psychology	Society for Personality and Social Psychology
Div. on Physiological and Comparative Psychology	Society for the Psychological Study of Social Issues
American Psychological Society	Society for Psychophysiological Research
Association for Advancement of Behavior Therapy	Society for Research in Child and Adolescent Psychopathology
Council of Graduate Departments of Psychology	Society for Research in Child Development
Federation of Behavioral, Psychological and Cognitive Sciences	Society for Research in Psychopathology
National Foundation for Depressive Illness, Inc.	Society for the Science of Clinical Psychology
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