## Psychology in Washington

# BASIC BEHAVIORAL SCIENCE RESEARCH FOR MENTAL HEALTH: A National Investment

## A Report of the National Advisory Mental Health Council Behavioral Science Task Force

## Executive Summary

To improve our Nation's mental health, the National Institute of Mental Health (NIMH) supports a wide range of research related to the etiology, diagnosis, treatment, and prevention of mental disorders. The Institute's advisory body, the National Advisory Mental Health Council (NAMHC), periodically surveys needs and opportunities in specific research areas relevant to the NIMH mission. In the recent past, NAMHC reviews have mobilized NIMH resources to develop promising research initiatives in schizophrenia, in mental disorders of childhood and adolescence, in basic neuroscience, and in research on services for people with severe mental illness. In a similar vein, the report summarized here is expected to provide guidance for the Institute's basic research programs concerning behavioral and social factors that promote mental health or contribute to mental disorders. It offers an overview of progress and promising lines of basic behavioral science[1] research, and highlights aspects of that research requiring the Institute's special attention and stimulation.

It is important to note that NIMH encourages and supports a far broader range of behavioral science research topics than those described here. This report focuses on basic behavioral science research within the existing scope of NIMH's Division of Neuroscience and Behavioral Science. It is directed particularly to research that addresses psychological and social factors affecting the normal behavior of the whole person (or organism) rather than physiological subsystems.

To conduct the extensive review process leading to the report, the NAMHC appointed a Steering Committee consisting of two behavioral scientists (Drs. Gordon Bower and John Kihlstrom) and four Council members (Drs. Jeanne Fox, James Jackson, Joseph Matarazzo, and James McGaugh). The Steering Committee enlisted the help of 12 other experts in behavioral science to serve on the ad hoc NIMH Basic Behavioral Science Research Task Force, which was convened especially for this review. The Task Force was directed to identify priority research areas with high potential for advancing basic knowledge that can aid in understanding, treating, and preventing mental and behavioral disorders.

Following initial planning sessions, the Task Force divided its work among six topic-based subcommittees. The subcommittee members wrote and exchanged concept papers in their specialties and met as a group to discuss the merits and priorities of various lines of research. The Steering Committee selected only some of the many significant lines of current research in each major area to include in the report. However, this sample is expected to convey the nature of the important scientific questions currently under investigation, along with some interesting and relevant findings and challenges for future research.

### THE PROBLEM TODAY

According to current estimates, more than one-fifth of all adults in the United States suffer from mental disor-

*Psychological Science* is pleased to reprint this Executive Summary of a report written in response to a request by the Senate Committee on Appropriations that a national plan for behavioral science research be developed. The authors of the report, the Behavioral Science Task Force of the National Advisory Mental Health Council, included 52 eminent behavioral and social scientists in the field as well as staff of the Division of Neuroscience and Behavioral Science of the National Institute of Mental Health (NIMH) (see the list of contributors at the end of the Executive Summary). To receive a complete copy of the report, write to the Behavioral, Cognitive, and Social Sciences Research Branch, NIMH, 5600 Fishers Lane, Room 11C-16, Rockville, MD 20857; e-mail: behavsci@helix.nih.gov.

1. Throughout this report, the term "basic behavioral science" includes a wide range of topics in psychology and related sciences (e.g., linguistics, ethology), as well as research domains often described as social science, such as sociology and cultural anthropology.

  

# MESSAGE FOR THE AMERICAN PSYCHOLOGICAL ASSOCIATION AND THE AMERICAN PSYCHOLOGICAL SOCIETY

Rex William Cowdry
*Acting Director, National Institute of Mental Health*

For 50 years, the National Institute of Mental Health (NIMH) has maintained a vigorous presence as a source of intellectual and financial support for the behavioral sciences specifically and for psychological science generally. The institute's portfolio has guided and responded to the needs of a thriving field, in areas extending from basic research studies of both individual processes (such as cognition and emotion) and interpersonal processes, to clinical neuropsychology, basic behavioral neuroscience, and studies of treatments derived from psychological research. A measure of the institute's continuing commitment to the field is the fact that NIMH today provides nearly half of all the National Institutes of Health's research training funds in the behavioral sciences.

The National Advisory Mental Health Council's report on basic behavioral research, highlighted here in *PS*, offers a telling picture of NIMH's role in the domain of basic behavioral science. Even in the report's unabridged form, however, the portrait is incomplete: By design, the advisory council's task force focused on only one facet of the institute's basic behavioral portfolio—work supported by the Division of Neuroscience and Behavioral Science (DNBS). Unexamined in this effort were NIMH's extensive scientific programs in behavioral neuroscience and clinical research. Yet if the DNBS focus limits the breadth of the review, it enhances the review's richness and depth. Equally important, the expertise and insights of the contributors and editors elucidate the extent to which even basic behavioral science is entwined in and integral to NIMH's mission-driven research to understand, treat, and prevent mental disorders.

The behavioral science report has distinguished predecessors. Beginning in the mid-1980s, the advisory council produced a series of research reports and opportunity assessments, focusing on schizophrenia, neuroscience, child and adolescent mental disorders, and mental health services research. Each served to nurture specific areas of NIMH research within the context of the institute's overall scientific program. The field can anticipate that this report, too, will lend itself to vigorous promotion of basic behavioral science as a critical element of NIMH's research portfolio.

Yet problems lie ahead. Deficit reduction efforts promise new challenges to researchers and research administrators alike. The possibility of a shrinking pie can produce either unity or divisiveness and its incumbent risks—that is, researchers who have different scientific backgrounds but share an interest in mental illness or health can choose to "hang together or hang separately." I hope that in justifying behavioral science research before the American public, we collectively encourage a focus on the quality of, need for, and size of NIMH's complete research enterprise, and will not let that focus be eclipsed by the interests of its component parts.

Through national plans and other efforts, NIMH has sought, with considerable success, to build a balanced portfolio of outstanding research on mental illness and mental health. We can all take pride in the way our fields have "hung together" to build this diversified research portfolio. Diversification—long recognized as a sound investment strategy—is also a scientific imperative. Through continued interdisciplinary partnerships, we will retain and enhance our capacity to respond effectively to scientific opportunity and evolving public-health priorities.

ders in any given year. For most of these people, the disorders are relatively mild and brief. But about 5 million adult Americans—2.8 percent of the adult population and possibly a similar proportion of children and adolescents—suffer from severe mental illnesses, such as schizophrenia, bipolar and unipolar affective disorder, schizoaffective disorder, autism, panic disorder, and obsessive-compulsive disorder.

In 1990, mental disorders of all types cost the Nation an estimated $148 billion. This figure includes treatment costs of $67 billion—10 percent of the total annual direct cost of health care in the United States. It includes, as well, the social costs of these illnesses, which collectively reduce life expectancy, lessen productivity, and increase demands on both the social service and criminal justice systems.

Economic data alone cannot begin to account for the enormous suffering borne by people with mental disorders and their families. Their pain is exacerbated by the societywide misunderstanding, fear, and stigmatization that still afflict people with these disorders and often limit their access to the social supports, services, and resources that can help them.

## PROGRESS AND PROSPECTS

Since its founding nearly 50 years ago as part of the nascent National Institutes of Health (NIH), NIMH has had a deep and productive commitment to basic research in behavioral science. Over the ensuing decades, these commitments have produced enormous benefits, changing how we understand ourselves and others, how we raise and educate our children, and how we manage our social relations with one another. Of particular significance to millions of Americans with mental illness and their families, basic research has made important contributions to the prevention, diagnosis, and treatment of mental disorders.

Treatment approaches derived from basic behavioral science research are now commonly used in many clinical settings. For example, basic studies on conditioning and learning have laid the foundation for a widely used group of treatments known collectively as "behavior therapy," which have been effective for combating depression, anxiety disorders, eating disorders, and alcohol abuse. Basic behavioral science research also has had other successful clinical applications, such as improved methods of marriage and family counseling, improved validity and reliability of mental disorder diagnostic categories, and more persuasive techniques of health education and health promotion.

Looking ahead to the 21st century and beyond, opportunities abound for further significant advances in knowledge and clinical care through basic behavioral science

research. This domain of inquiry is enormous; it ranges from how nature and nurture interact to affect memory and personality to how culture affects the recognition, expression, and course of mental disorders.

Thus, this summary, like the report it attempts to encapsulate, can only hint at the promising basic behavioral science research opportunities and needs before us. It illustrates the direction and pace of progress, points to new paths of scientific investigation and promise, and recommends ways to strengthen the research enterprise. Readers are urged to consult the full report for a more extensive discussion of the knowledge and needs that give rise to the following opportunities and recommendations.

## BASIC BEHAVIORAL RESEARCH OPPORTUNITIES

### Emotion and Motivation

Advances in the study of emotion now permit researchers to identify fundamental emotions and how they develop and to examine their role in individual and group behavior. Using new measurement techniques, researchers can "read" and study subtle facial expressions and emotional states that are not normally perceptible. These and other developments are helping to specify the linkages between diverse types of normal and abnormal emotional experience, such as depressed mood, and specific patterns of brain activity. Research is also clarifying the special adaptive and maladaptive roles of negative emotions, such as anger, fear, sadness, and disgust.

Studies of motivation in animals are providing a more precise understanding of both the biological and social regulation of eating, mating, sleeping, and other life-supporting activities often disrupted in humans with mental disorders. For example, rats, like humans, overeat more in groups than when alone, and chimpanzee dietary habits, such as food-getting skills and tool use, are culturally transmitted.

Researchers are also shedding new light on the key role of language, abstract thought, and other symbolic activities in shaping human motivation and behavior. They are specifying the emotional effects of having diverse types of short-term and long-term goals, sharpening our understanding of achievement motivation, spelling out the particular benefits of intrinsic motivation for performance, and bringing new understanding to an essential component for effective treatment and prevention: motivation for behavior change.

These advances raise further questions for future research:

- What connections link the subjective, expressive, and physiological components of emotional and temperamental traits that play a role in behavioral disorders of childhood?
- What are the continuities across and distinctions among emotion (both positive and negative), mood, and emotional traits?
- What are the patterns of emergence of children's coping strategies for controlling their emotions and thereby their social relationships?
- How are patterns of emotional communication related to the development, maintenance, and erosion of emotional bonds and empathy between caregiver and infant, between peers, and between romantic partners?
- How do motivated behaviors, such as sleeping, eating, drinking, and mating, arise from the interaction of the external environment with physiological factors such as hormones and neurotransmitters?
- What are the behavioral and biological mechanisms through which hormones and the environment interact to shape sex differences in reproductive behavior, and what are the critical timeframes for these interactions?
- What processes are involved in developing, fostering, and maintaining intrinsic motivation, and how are these processes linked through intrinsic motivation to self-esteem and psychological functioning?

Additional research issues include—

- Developing improved methods to assess the vocal, postural, gestural, and facial components of emotional expression as well as antecedent conditions, subjective emotional experience, and physiological activity.

### Vulnerability and Resilience

Research increasingly demonstrates that the hardiness of a person's self-concept depends on the interplay of both genetic predispositions and environmental experience. Personality researchers are discovering relatively stable temperamental traits and personality patterns in infants and young children that are precursors and predictors of later problem behavior and psychopathology, such as drug addiction, depression, and possibly anxiety disorders. They are also finding that some of these patterns can be changed—even in adulthood. For example, intervention studies suggest that the hostility component of "type A" behavior, which contributes to heart disease, can be altered through behavioral counseling.

Considerable research has examined the mental and physical health of "repressors"—people who characteristically and unconsciously inhibit their emotions. It consistently shows that such behavior increases cardiac re-

actions, impairs immune function, and contributes to various health problems. Other studies in humans and animals are examining the temperamental trait of shyness, found among 15 to 20 percent of human and monkey infants, and are clarifying how this trait is affected by the interplay of genetic and environmental factors.

Many studies confirm that the quality of early attachment between infants and their caregivers is critical to healthy emotional development. Insecure attachment can lead to difficulties in relating to other people as well as later problems in childrearing. However, researchers have also found that caregivers' sensitivity and responsiveness in interacting with infants—a key factor in early attachment security—can improve with therapy.

People's self-concepts are now recognized as differentiated, encompassing domains of life such as scholastic ability, physical appearance, and job competence. This view has opened the door to a richer perspective on self-esteem and how it develops and changes over time. For example, research is revealing that individuals differ in how much their self-esteem depends on their physical appearance. Research is also identifying the characteristics of schools that raise or lower self-esteem and academic performance. These advances raise further questions for future research:

- Through what developmental pathways is self-esteem formed and maintained?
- What are the detailed patterns of stability and change in parent-child attachment relationships, and what is the developmental impact of early childhood attachments to grandparents, siblings, and other caregivers?
- What are the possible contributions of major life stressors, such as divorce and severe medical illness, to a child's emerging attachment security and subsequent development?
- What cultural strengths maintain a solid sense of self among ethnic minority-group members, collectively and individually?

Additional research issues include—

- Developing theory and assessment tools to understand stability and change in specific personality patterns over time.
- Enhancing self-report measures of personality traits by using judgments by reliable observers, collecting behavioral observations in natural and laboratory settings, and recording concurrent psychophysiological reactions.

**Perception, Attention, Learning, and Memory**

How do fuzzy patches of light on the retina become transformed into our meaningful 3-dimensional visual world? Significant advances have occurred in understanding critical aspects of perception, such as how we automatically analyze the shape of objects to recognize them quickly, from any angle. Other research on perception is revolutionizing our understanding of how we read; recent findings suggest that in performing that form-recognition task, humans resemble ultrafast computers that use parallel processing rather than those using serial processing. Researchers have developed many ways to assess normal and abnormal attention and are clarifying the demands of various tasks on our attentional resources. They are also illuminating the relation between attention, consciousness, and perceptual processing.

Basic research on learning has contributed to a wealth of treatment approaches for mental disorders and drug addiction. It has also provided animal models, such as "learned helplessness," that reveal some of the complex mechanisms contributing to depression and anxiety disorders. Research on how fears and phobias are acquired is clarifying how fears can be learned—or prevented—by observing the behavior of others. Research on a learning phenomenon known as "blocking" suggests that animals are quite sophisticated in detecting and analyzing environmental cues and associating them to significant outcomes. Other research reveals that old learning is not eradicated; it simply becomes controlled by new stimuli. Identifying and controlling such stimuli may prove to be critical for regulating unwanted behavior.

The vagaries of normal memory are increasingly well documented through laboratory studies of how people reconstruct remembered events. Researchers are also delineating how emotion and mood color the events we place into memory as well as how we later recall them. By uncovering an inbuilt bias for recalling events similar in emotional tone to one's current mood, this research helps to explain some of the cognitive biases that perpetuate normal and abnormal mood states. Research also reveals several distinct forms or systems of memory. One of these, implicit or unconscious memory, has been shown to exist even when brain injury or other conditions impair conscious memory. Other memory-related research shows how thoughts one tries to suppress often return with a vengeance.

These advances raise further research questions:

- What are the characteristic adaptations and compensations of people with perceptual or motor deficits, how do they arise, and how do they vary with age?
- What specific mechanisms of attention are implicated in the causes, prevention, and treatment of particular attention-related disorders?

- What learning and decisionmaking phenomena are related to individual differences in acquiring self-control, particularly delay of gratification?
- What causes memory failures and distortions in normal individuals, and how are these processes exacerbated in disorders such as Alzheimer's disease, Korsakoff's syndrome, and the various amnesias?
- How is negative or threatening information organized in and retrieved from memory?
- How do aging-related changes affect the speed of cognitive processing and the rate of acquiring new cognitive skills?
- What are the positive and negative effects of using advanced information technologies, such as virtual reality, on perceptual and cognitive skills and social interactions?

### Thought and Communication

Research on normal thinking and judgment reveals that most reasoning is unconscious, automatic, and rarely open to introspection. How emotion colors judgment is becoming clearer, such as the finding that during sad states, people are more likely to report health problems and be pessimistic about future health. Although worries and other negative thoughts are very difficult to control, especially by people with anxiety and depression, new training approaches may provide more effective ways to suppress such thoughts. Studies suggest that people generally adjust their scale of satisfaction to judge their current state as moderately positive.

Advances in human information processing have greatly altered our notion of intelligence. For example, intelligence is closely related to how rapidly people can recognize significant patterns and retrieve information from long-term memory. Intelligence is also related to analogical reasoning—transferring knowledge from one situation to another. The cognitive strategies underlying this critical ability are now being identified. The possibility of multiple types of intelligence is also under investigation.

Researchers have now developed measures of infant learning that show promising correlations with some components of intelligence 6 years later. They have also discovered unexpected capabilities in babies, such as rudimentary counting. Other research is examining the development of children's "theories" about physical causation and about other people's minds.

The discovery of universal structural principles among languages of the world—including sign languages—suggests that language arises from a specific brain system. Researchers have also uncovered a universal timetable for acquiring language, which appears to depend more on children's maturation than their length of exposure to language. Recent research is clarifying the linkage between specific aspects of language use and particular areas of the brain to aid in diagnosing brain disorders. Neural-network modeling, using data from animal and human experiments, explores in computer models how complex networks of elements similar to brain nerve cells might give rise to different aspects of language behavior.

Research questions raised by these advances include—

- How do distorted thought patterns, such as those seen in depression and anxiety disorders, arise from and interact with normal thought?
- How do emotions, mood, and stress influence reasoning, decisionmaking, memory, and the development and structure of cognitive biases?
- Why does thought suppression so often fail, what strategies enhance its effectiveness, and what methods can help people overcome sustained negative thoughts and feelings?
- How does everyday reasoning operate in practical situations that require making major decisions, including choice of mate, school, career, and medical treatment?
- How do people in diverse cultural groups differ in the types of information they attend to and in their patterns of reasoning?
- How do creative and inventive types of thinking operate, and how can they be enhanced?
- What genetic and experiential factors underlie disorders of cognition, including disorders of language capacity?

Additional research issues include—

- Studying language and learning to discover principles for presenting information for the most effective comprehension and impact.
- Conducting validation studies to refine measures of cognitive function in infancy that predict later intellectual functioning.
- Testing and specifying further neural network models of cognition based on the organization of brain cells.

### Social Influence and Social Cognition

Progress in understanding how social influence and social cognition affect health and social well-being has led to studies of ways to harness these forces constructively. Research is clarifying how racial and gender stereotyping contribute to interpersonal hostility and loss of self-esteem, and how negative stereotyping can be lessened. Researchers have found that having people adopt behavior inconsistent with their attitudes can lead to attitude

change, and techniques for persuading young people to resist group pressure have emerged.

Research on social cognition is not only exploring how social beliefs influence interpretations of and reactions to events, but also how events—even those outside conscious awareness—can trigger different social behaviors. Also under study are the powerful effects of how people attribute cause. For example, aggressive boys tend to expect aggression and are prone to interpret ambiguous behavior as hostile; these attributions—and related aggressive behavior—appear to change with certain types of therapy.

Research has confirmed that discrimination and stigmatization force many people to devalue their social identities. However, members of stigmatized groups can preserve their self-esteem by emphasizing other less-threatened aspects of their identity. Research is now exploring the long-range implications of such socially reactive shifts in identity as well as how more constructive strategies may counteract threats to social identity.

Further research questions raised by these advances include—

- How do the principles learned through basic research on persuasion operate within counseling and psychotherapeutic interventions, and how can they be used to enhance those treatments?
- Through which cognitive and social mechanisms do maladaptive beliefs produce persistently biased judgments, and what social conditions promote negative or self-defeating evaluations?
- What psychological and social factors can deter or override the use of stereotypes, and how can this knowledge be applied and evaluated in real-life situations?
- Which aspects of identity are more or less vulnerable to challenge and change, and which social, cognitive, and behavioral characteristics accompany transformations in identity?
- How do social standards, stereotypes, and identity develop, and how are phases of cognitive development linked to exposure to socially evaluative messages from parents and the broader social and cultural environment?
- What factors strengthen social attitudes, and how does the family and community context contribute to the formation of these attitudes?

### Family Processes and Social Networks

Family interactions provide a vital context for mental health and illness. For example, children of parents with schizophrenia are significantly more likely to develop a severe mental disorder when raised in dysfunctional adoptive families than in healthy, supportive adoptive families. However, the reasons for this association remain unclear.

Research indicates that caregivers who are excessively controlling undermine children's persistence, competence, self-regulation, and overall ability to cope with life's problems. Children also influence and control their caregivers, and some children with difficult temperaments severely challenge their caregivers' sensitivity and disciplinary strategies.

Researchers are exploring how marriage and intimacy affect well-being and mental health and are seeking predictors of successful marriages. Heart-rate measurements made while couples discuss conflict-laden issues can forecast the likelihood of marital survival, in some cases more reliably than the spouses' reports of marital satisfaction. Research on partners' mutual emotional support has led to advances in therapeutic techniques that can reduce marital distress and depressive symptoms.

In families in which adults consistently escalate their hostility and intensity of conflict, both parents and children are at high risk for distress and psychopathology. Across many social classes and ethnic groups, marital dissolution and childrearing outside of marriage often have long-term negative effects on children, including lowered achievement and intellectual test scores, increased school dropout, early motherhood, and antisocial behavior. New studies of mother-stepfather families have challenged the idea that stepfathers can easily replace biological fathers.

Studies show that social support protects healthy people from the negative emotional consequences of stressful life events, helps people with clinical depression maintain their treatment gains, improves recovery of physically ill people, and helps people with schizophrenia function in the community while lessening their chances of relapse. Social networks increase the flow of information, material assistance, and other resources to needy individuals. Research is exploring ways to foster social support and use it to help caregivers in their own supportive roles.

Further research questions raised by these advances include—

- What are the health-promoting versus stress-exacerbating aspects of parent-child relations across the lifespan?
- Through which specific paths and mechanisms do family stresses and disruptive family problems, such as high-intensity marital conflict or sibling aggression, lead to adjustment problems?
- Which skills and processes foster interpersonal satis-

faction and contribute to the receipt of long-term social support, and what are the most beneficial matches between types of support and individual life situations?

- What variations within and across cultures in beliefs, attitudes, and practices contribute to the formation and maintenance of satisfying intimate relationships?
- How do various family structures and changes in structures affect adjustment throughout life?

Additional research issues include—

- Determining through prospective longitudinal studies how accomplishments or problems during one phase of family life can affect mental health outcomes in later life and across generations.
- Improving the reliability and validity of family assessment measures across groups varying in cultural background and degree of risk for psychopathology.

### Sociocultural and Environmental Processes

Research is illuminating the social, cultural, and environmental forces that shape who we are and how well we function in the everyday world. For example, large cross-cultural differences in the rate of recovery from schizophrenia may stem, in part, from diverse cultural beliefs about its causes and nature. Cultural differences may also bias diagnoses of mental illness when clinicians misinterpret symptoms in people from unfamiliar cultures.

Studies of economically disadvantaged racial, ethnic, and cultural groups in the United States reveal that discrimination often results in chronic levels of stress that have physical effects, such as increased blood pressure; social effects, such as racial distrust; and psychological effects, such as "dis-identifying" with academic activities. Research on the conflicts and adaptive mechanisms of minority-group members consistently shows that biases operating between groups are more strongly influenced by preferences toward their own members than by negative feelings toward members of other groups. When ethnic groups increasingly focus on their own members, that behavior ultimately heightens conflict with other groups. One line of research is attempting to create new social structures with which individuals from diverse cultural groups can identify.

The highest rates of diagnosable mental disorder are found among groups with the lowest socioeconomic status. Having a mental disorder can cause people to drift into poverty, but deprivations related to poverty also appear to contribute to mental disorder. Indeed, virtually all major psychosocial risk factors for mental illness are more prevalent at lower socioeconomic levels.

Research reveals how economic hardship often severely disrupts parenting and family interactions, with adverse long-term mental health implications for children. Mothers with chronic financial problems are frequently rejecting and behave inconsistently toward their children in a manner strongly resembling mothers with clinical depression. However, positive family relationships and childrearing practices and preschool support programs can reduce or eliminate many of these adverse effects.

The widespread employment of women has few negative effects—and some beneficial ones—on the women, their spouses, and their children. Studies also reveal that the involvement of husbands in childcare and household labor can improve the mental health of working wives, and that mothers who engage in repetitive, routine paid work are less available emotionally to their children and less able to assist their development than are other working mothers.

The nature of communities and organizations plays a more powerful role in family and individual well-being than was previously believed. Researchers are exploring how the economic decline of neighborhoods limits adults' access to jobs, social networks, and positive family role models, and children's access to supervision, thus contributing to increased community disorganization and social problems. Some of these effects can be altered through close social and organizational networks. Both attachment to schools and participation in community organizations have been shown to protect at-risk youths from delinquency and antisocial behavior.

Further research questions raised by these advances include—

- How does ethnicity affect social cognition and achievement motivation, and what cultural differences exist in the expression and labeling of emotion?
- How do cultural norms affect the diagnosis and treatment of mental illness and the extent to which members of different cultures expect to provide for the "at home" nurturing of individuals with mental illness?
- How do ethnic and racial discrimination in school and work settings affect the mental health of individuals?
- How do individuals, social groups, and communities develop successful strategies for dealing with disempowering situations?
- How is the mental health of immigrants influenced by such factors as acculturation, socioeconomic status, the presence or absence of an accessible ethnic community, the ethnic composition of schools, and support systems in the work environment?
- What processes mediate and moderate the effects of socioeconomic status on mental health, including work experience, availability of health care and other supports, and variation across social and ethnic groups?
- How is the well-being of parents and children affected by such factors as the nature of work environments, spouses' supportiveness for one another's work de-

mands and aspirations, and varying kinds of family constellations?

- What key aspects of communities threaten or protect mental health and well-being, including the supportive role of social networks and challenges created by instability in educational, occupational, and residential environments?

## RECOMMENDATIONS

To assure the continuing contributions of NIMH-funded basic behavioral science research to the growth of knowledge and its application to improved mental health, the National Advisory Mental Health Council makes the following essential recommendations.

- Increase support for investigator-initiated research.
- Increase support for research training.
- Preserve expert review of basic behavioral science.
- Encourage basic/clinical research collaborations.
- Preserve and expand facilities for research on behavioral and social processes in animals.
- Strengthen the methodologies of basic behavioral science research.
- Establish multimedia data base archives for basic behavioral science.
- Facilitate the support and conduct of longitudinal research.

Behavioral Science and Mental Health

## NIMH BASIC BEHAVIORAL SCIENCE TASK FORCE

*Task Force Steering Committee*

*Co-Chairs*

**Gordon H. Bower, Ph.D.**
Department of Psychology
Stanford University
Stanford, CA

**John F. Kihlstrom, Ph.D.**
Department of Psychology
Yale University
New Haven, CT

*Council Members*

**Jeanne C. Fox, Ph.D.**
Southeastern Rural Mental Health Research Center
University of Virginia
Charlottesville, VA

**James S. Jackson, Ph.D.**
Institute for Social Research
University of Michigan
Ann Arbor, MI

**Joseph D. Matarazzo, Ph.D.**
Department of Medical Psychology
Oregon Health Sciences University
Portland, OR

**James L. McGaugh, Ph.D.**
Center for the Neurobiology of Learning and Memory
University of California
Irvine, CA

*Task Force Subcommittee Co-Chairs*

**Irving Biederman, Ph.D.**
Department of Psychology
University of Southern California
Los Angeles, CA

**Patricia Carpenter, Ph.D.**
Department of Psychology
Carnegie Mellon University
Pittsburgh, PA

**Rand Conger, Ph.D.**
Center for Family Research in Rural Mental Health
Iowa State University
Ames, IA

**Charles R. Gallistel, Ph.D.**
Department of Psychology
University of California
Los Angeles, CA

**H. Hill Goldsmith, Ph.D.**
Department of Psychology
University of Wisconsin
Madison, WI

**James House, Ph.D.**
Survey Research Center and Department of Sociology
University of Michigan
Ann Arbor, MI

**James M. Jones, Ph.D.**
Department of Psychology
University of Delaware
Newark, DE

**Daniel Kahneman, Ph.D.**
Department of Psychology
Princeton University
Princeton, NJ

**Robert W. Levenson, Ph.D.**
Department of Psychology
University of California
Berkeley, CA

**Carolyn Rovee-Collier, Ph.D.**
Department of Psychology
Rutgers University
New Brunswick, NJ

**Diane Ruble, Ph.D.**
Department of Psychology
New York University
New York, NY

**Charles Snowdon, Ph.D.**
Department of Psychology
University of Wisconsin
Madison, WI

*Task Force Subcommittee Members*

**Jeffrey Alberts, Ph.D.**
Department of Psychology
Indiana University
Bloomington, IN

**Ana Marie Cauce, Ph.D.**
Department of Psychology
University of Washington
Seattle, WA

**Margaret Clark, Ph.D.**
Department of Psychology
Carnegie Mellon University
Pittsburgh, PA

**Carolyn Cutrona, Ph.D.**
Department of Psychology
Iowa State University
Ames, IA

**Frans deWaal, Ph.D.**
Department of Psychology
Emory University
Atlanta, GA

**Alice Eagly, Ph.D.**
Department of Psychological Sciences
Purdue University
West Lafayette, IN

**Robert Emde, M.D.**
Department of Psychiatry
University of Colorado Health Sciences Center
Denver, CO

**David Funder, Ph.D.**
Department of Psychology
University of California
Riverside, CA

**Howard Gardner, Ph.D.**
Graduate School of Education
Harvard University
Cambridge, MA

**Susan Gelman, Ph.D.**
Department of Psychology
University of Michigan
Ann Arbor, MI

**Byron Good, Ph.D.**
Department of Social Medicine
Harvard Medical School
Boston, MA

**Judith Harackiewicz, Ph.D.**
Department of Psychology
University of Wisconsin
Madison, WI

**Susan Harter, Ph.D.**
Department of Psychology
University of Denver
Denver, CO

**E. Tory Higgins, Ph.D.**
Department of Psychology
Columbia University
New York, NY

**Keith Holyoak, Ph.D.**
Department of Psychology
University of California
Los Angeles, CA

**Shinobu Kitayama, Ph.D.**
Department of Psychology
University of Oregon
Eugene, OR

**Elizabeth Loftus, Ph.D.**
Department of Psychology
University of Washington
Seattle, WA

**Martha McClintock, Ph.D.**
Department of Psychology
University of Chicago
Chicago, IL

**Sara McLanahan, Ph.D.**
Department of Sociology & Public Affairs
Princeton University
Princeton, NJ

**Elizabeth Menaghan, Ph.D.**
Department of Sociology
Ohio State University
Columbus, OH

**Susan Mineka, Ph.D.**
Department of Psychology
Northwestern University
Evanston, IL

**Elissa Newport, Ph.D.**
Department of Psychology
University of Rochester
Rochester, NY

Behavioral Science and Mental Health

**Michael Posner, Ph.D.**
Department of Psychology
University of Oregon
Eugene, OR

**Robert Rescorla, Ph.D.**
Department of Psychology
University of Pennsylvania
Philadelphia, PA

**Catherine E. Ross, Ph.D.**
Department of Sociology
Ohio State University
Columbus, OH

**Evelyn Satinoff, Ph.D.**
Department of Psychology
University of Delaware
Newark, DE

**Daniel Schacter, Ph.D.**
Department of Psychology
Harvard University
Cambridge, MA

**Mark Seidenberg, Ph.D.**
Neuroscience Program
University of Southern California
Los Angeles, CA

**Steven J. Sherman, Ph.D.**
Department of Psychology
Indiana University
Bloomington, IN

**Marybeth Shinn, Ph.D.**
Department of Psychology
New York University
New York, NY

**Robert Sternberg, Ph.D.**
Department of Psychology
Yale University
New Haven, CT

**Stephen Suomi, Ph.D.**
Laboratory of Comparative Ethology
National Institute of Child Health and Human Development
Bethesda, MD

**Esther Thelen, Ph.D.**
Department of Psychology
Indiana University
Bloomington, IN

**Anne Treisman, Ph.D.**
Department of Psychology
Princeton University
Princeton, NJ

*Participating NIMH Staff*

**Stephen H. Koslow, Ph.D.**
Director
Division of Neuroscience and Behavioral Science

**Mary Ellen Oliveri, Ph.D.**
Chief
Behavioral, Cognitive, and Social Sciences Research Branch

**Rodney R. Cocking, Ph.D.**
Program Manager
Minority Institutions Program
(formerly Chief, Fundamental Cognitive Mechanisms Program)

**Della M. Hann, Ph.D.**
Chief
Interpersonal and Family Processes Program

**Lynne C. Huffman, M.D.**
Chief
Personality and Emotion Program

**Howard S. Kurtzman, Ph.D.**
Chief
Cognitive Science Program

**Edison J. Trickett, Ph.D.**
Special Assistant on Sociocultural Processes in Mental Health

**Anne H. Rosenfeld**
Public Affairs Specialist
Office of the Director, NIMH

**Robert Trotter**
NIMH contract writer

## Editorial

# PSYCHOLOGY, THE BASIC SCIENCE FOR MENTAL HEALTH

Largely through research supported by the National Institute of Mental Health (NIMH), we now know a great deal about the causes of various forms of mental illness, the conditions maintaining them, and the ways in which they might be treated and prevented. Mental illness can be diagnosed reliably, and there are available more, and more effective, options for treating it. Much of this advance has come from research devoted to such specific syndromes as schizophrenia, anxiety disorder, and depression. But the foundations for this applied, clinical research have been laid by research on basic processes that are presumably implicated in mental illness. Some of this basic research has achieved a better understanding of the structure and functions of the nervous and endocrine systems, while other relevant research has focused on genetic factors. But these efforts to understand the biological basis of abnormal mind and behavior have been complemented by other research that investigates the basic psychosocial processes that are relevant to mental health and illness.

This central role of basic psychosocial research in understanding and treating mental health has long been recognized by NIMH. In 1992 the National Advisory Mental Health Council (NAMHC), the advisory board of NIMH, convened a Behavioral Science Task Force, co-chaired by Gordon H. Bower and myself, for the purpose of reviewing recent research in the behavioral and social sciences, highlighting those recent accomplishments that are especially relevant to mental health, and identifying promising research opportunities for the future. The task force included a subcommittee of behavioral scientist members of the NAMHC itself, the director and chiefs of the Division of Neuroscience and Behavioral Science at NIMH, and a distinguished panel of 46 researchers, in fields running from ethology to cultural anthropology, who prepared a large number of concise reviews of advances in psychosocial knowledge—reviews that fill three volumes. Now, after more than 2 years of work, the task force has issued its final report, *Basic Behavioral Science Research for Mental Health: A National Investment*.

This issue of *Psychological Science* reprints the executive summary of the task force report, along with introductory comments by Dr. Rex W. Cowdry, acting director of NIMH, and a list of the people who contributed to the process. In a cooperative publishing venture, *American Psychologist* is simultaneously publishing the introduction and recommendations of the report. The full report is available from the NIMH Division of Neuroscience and Behavioral Science.

### BASIC PREMISES

Two premises underlie the task force report. The first is that basic and applied research go hand in hand. This assumption is commonly made elsewhere in the health sciences. It is why training programs in the health professions include courses in biochemistry, anatomy, physiology, microbiology, genetics, and pharmacology. These are the basic sciences for medical research and practice. They tell us how things operate normally, so that we may recognize what is wrong in disease. The same principle applies in the case of mental illness. Studies of normal behavioral, mental, and social processes provide a baseline against which mental illness and abnormal behavior can be measured and understood.

The second assumption is that psychosocial factors are as important as biological factors in gaining a full understanding of the causes, courses, and treatments of mental disorders. Consider, for example, the strongest case we can make for genetic influences on mental illness—namely, schizophrenia. The best estimate of the concordance rate for schizophrenia in identical twins is about 40%. This value indicates a significant (and substantial) genetic component to schizophrenia, but makes clear that variables besides genetic inheritance are also important determinants of major mental illness. According to the logic of twin studies, the remaining variability in outcome, approximately 60% of the total, is attributable to those features of the psychosocial environment that are not shared by the twins in question. That is, the different outcomes for the schizophrenic proband and his or her normal twin are due to environments and experiences that the twins do not have in common.

A similar case can be made at the other end of the illness cycle. For example, it appears that different cultures differ strikingly in the recovery of their peoples from serious mental illness. Thus, the recovery rate from the first episode of schizophrenia is approximately 4% in Denmark, but approximately 48% in Nigeria. And even within a particular culture, aspects of the psychosocial

environment have substantial effects. For example, we now know that individuals who have recovered from schizophrenia are less likely to relapse if they are discharged to a family characterized by a positive rather than a negative emotional atmosphere; moreover, it turns out that it is the nature of the family as perceived by the patient, rather than as would be described by an objective observer, that affects outcome.

These facts do not have their origins in the genes, or in the nervous or endocrine systems. Rather, they have to do with how the environment, especially the social environment, affects the people who live in it; and they have to do with the cognitive, emotional, and motivational processes that guide the individual's interactions with that environment. Thus, from its initial two premises, the task force draws the conclusion that psychology, sociology, and anthropology must be basic sciences for mental health, along with genetics, physiology, and neuroscience. Therefore, basic researchers in these behavioral sciences, including those studying nonhuman animals, deserve continued, and increasing, support from NIMH.

## ACCOMPLISHMENTS TO DATE

Of course, NIMH has always supported basic psychosocial research, and the report makes it clear that the institute's investment in basic psychosocial research has paid off handsomely. Over the past decade or two, we have completely revolutionized our understanding of basic behavioral, mental, and social processes. These changes have affected every aspect of behavioral and social science—from elementary processes of classical conditioning to the complexities of human development and social relations. Compared with the situation of 20 years ago, the current base of knowledge is almost unrecognizable. For example:

- Learning is no longer viewed as the passive acquisition of stimulus-response associations, but rather the active generation of predictions and hypotheses concerning forthcoming events.
- Perception turns out to be more than the flow of stimulus information from peripheral receptors to the brain, but rather reflects a complex interaction between bottom-up and top-down processes.
- Our understanding of how people think, reason, and make judgments and decisions has completely overthrown the standard model for human rationality, which has prevailed for more than 2,000 years.
- We have an entirely new view of the nature of unconscious mental life, and of the reciprocal relations between cognitive and emotional processes.
- We know better how to support people's intrinsic motivation for learning, behavior, and behavioral change.
- The cognitive capacities of infants and young children are far greater than we previously imagined.
- We have discovered the fundamental structure of individual differences in personality, and we understand better the way in which personality emerges, and changes, as the individual interacts with his or her environment.
- We have a better notion of how social status, and social affiliation, affects the individual's attitudes and behaviors—how individuals draw support from people around them, and how they relate to others in order to create a supportive social environment.
- We know more about the role that culture plays in the life of the individual, and we have a better appreciation of cultural differences in attitudes, beliefs, and behavior.

One major theme emerging from the report is the importance of reciprocal influence, or bidirectionality of causation, between biology and culture, between the individual and society, and among cognition, emotion, and motivation. Another is the continuing importance of research on nonhuman animals, in both laboratories and naturalistic environments.

## RECOMMENDATIONS

The report also contains some recommendations for action. There have been striking advances in our knowledge of psychosocial processes, but our understanding is far from complete. We need to fill in a lot of the details. Moreover, in many instances, the findings of research have opened up entirely new territory to be explored.

Some of these recommendations involve new institutional structures for research. For example, some of the most exciting research in personality, development, and social interaction is longitudinal. Unfortunately, the demands of longitudinal behavioral research are not entirely compatible with the constraints imposed by traditional research grant review. It is hard to do 20-year follow-ups when you have to compete for funding every 4 years, so the task force has proposed new funding mechanisms for longitudinal research.

Because the scope of psychosocial research is very broad, the task force expresses concern that some excellent work may slip through the cracks as NIMH returns under the National Institutes of Health umbrella and acquires a different, and drastically reduced, review structure. In order to give the institute the best review possible, the report proposes an expanded system of study sections, which will ensure both breadth of coverage and depth of expertise.

Most important, the task force proposes expanded support for investigator-initiated research. This has al-

ways been the source of the greatest advances in our field—or, indeed, in any area of science. NIMH review committees see a great deal of excellent science—science that will take us in new directions, and show us things we would not otherwise know—that will not be done because of the lack of federal support. There was a time when the pay line for federal grant applications was between 40% and 50%. Now it is closer to 10%. The task force recognizes that there are more good researchers, doing more good research, than ever before—and that more than anything else, what we need is more resources to support them.

## WHAT IS TO BE DONE?

Since its inception in 1949, NIMH has needed no convincing that basic behavioral science research is critical to its mission, and for almost half a century it has acted on its convictions by supporting a vigorous program of basic research in behavioral, cognitive, emotional, motivational, and sociocultural processes. This commitment has not been reduced by politicians' questioning of the virtues of behavioral and social science or calls to shift resources from basic to applied research. However, the recent threat to the behavioral and social science programs at the National Science Foundation shows that political forces can affect an agency's ability to fulfill its commitments. If NIMH is to succeed in maintaining and strengthening its portfolio of basic behavioral research, and if psychological science is to continue as a major beneficiary of NIMH support, we must help. We should all grasp the opportunity afforded by the task force report to promote basic psychosocial research: to remind the public of how much we have learned, and of how much remains to be discovered, about mind and behavior, and about individuals and society.

—JOHN F. KIHLSTROM