

**Report of the Working Group of the NIH
Advisory Committee to the Director on
Research Opportunities in the Basic
Behavioral and Social Sciences**

December 2, 2004

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Basic behavioral and social science research is of critical importance to the mission of the NIH. Although this work does not directly address disease outcomes per se, behavioral and social processes play a critical role in understanding the links of molecular, genetic, and neural processes with health and disease. Basic behavioral and social science research provides knowledge, methodology, and measures that are essential for prediction, prevention, understanding individual variation, and controlling illness, for minimizing the collateral impact of disease, and for promoting health. Because of its centrality to the NIH mission, it is crucial that basic behavioral and social science research be supported and nurtured. In Winter of 2004, a Working Group of the Advisory Committee to the Director (ACD) was established to examine basic behavioral and social sciences research across the NIH (Attachment A). The committee was composed of 14 members representing a wide range of the disciplines and scientific areas in the behavioral and social science (Attachment B). The Working Group was chaired by Dr. Linda Waite of the University of Chicago and an ACD member and charged with reviewing the existing portfolio of basic behavioral and social sciences research, identifying areas of opportunity, examining barriers to the submission and review of applications in this area, and making recommendations for improving NIH's program in basic behavioral and social sciences research (Attachment C).

Background

Over the past several years, representatives of the behavioral and social sciences and Congress have expressed concern about two issues: 1) the need for greater funding for basic behavioral and social sciences research throughout the NIH in general and at the National Institute of General Medical Sciences (NIGMS) in particular and 2) the lack of a trans-NIH strategy for training in the behavioral and social sciences again with a specific concern about NIGMS support. (Attachment D). Recent changes in priorities at NIMH have lead the Institute to curtail funding for research in basic behavioral and social sciences, causing a particular sense of urgency in the research community. Following recent intensified interest by Congress and in conjunction with NIH leadership, a plan was developed to deal with the concerns raised, which included a review by eminent scientists familiar with the NIH and the relevant research. The Office of Behavioral and Social Sciences Research (OBSSR) was given responsibility for coordinating these activities, with substantial input from NIH leadership.

Importance of Basic Behavioral and Social Science for the Mission of the NIH

Robust, stable, and intriguing findings drawn from a wide range of empirical investigations show that social and behavioral factors are associated with essentially every aspect of health and illness, spanning etiology, course, prognosis, prevention, treatment, interface with health care systems, rehabilitation, and quality of life throughout the entire disease process. Moreover, in a wide range of psychiatric, neurological, and physical illnesses, disturbances and disruptions of normal behavioral and social functioning create the greatest burden for patients and families and

create the greatest economic costs. Of course, the most basic behavioral and social science research does not examine diseases or interventions directly, but rather aims to measure, understand, and control processes in ways that will later enable them to be applied to disease and treatment in meaningful ways. As with all types of basic scientific inquiry, be it in genetics, biology, or the behavioral and social sciences, the direct link between a theoretical construct and health is a result of incremental discoveries that accumulate over time. The location of this basic research at NIH fosters the integration of findings from basic behavioral and social science research with biology, chemistry, and genetics and translation into clinical practice. It also focuses this basic research on health.

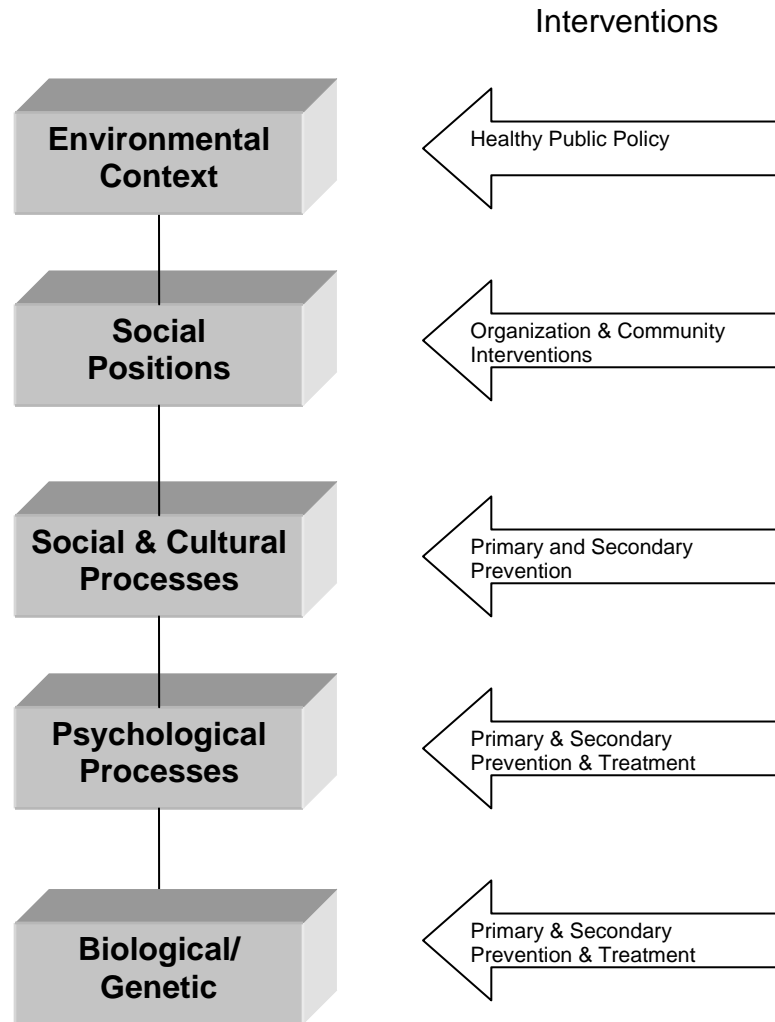
Following are some examples of how basic behavioral and social science findings have shaped understandings about health and illness:

- Experimental research on learning and conditioning with animals and humans introduced behavioral views into models of psychopathology and laid the foundation for most empirically-validated behavioral treatments for the treatment of fears, phobias, depression and other disorders. Many of these behavioral treatments can be used synergistically with or as alternatives to pharmacological treatments.
- General principles of learning and behavior show how harmful behavior can be changed. These observations have led to behavioral change strategies commonly used in prevention programs such as smoking cessation.
- Investigations on social networks and social relationships form the basis for programs that enable families and groups to better assist individuals recovering from an illness.
- Treatments, such as systematic desensitization and exposure therapy, can be traced directly to research on learning in animals.
- Basic research on emotion and affect has provided a more differentiated and nuanced view of the ways that emotional functioning is altered in diseases such as schizophrenia, autism, and a range of neurological disorders.
- Studies of color, motion and pattern perception clarify the role of signals in the retina and visual cortex. This understanding is essential in devising experiments to measure the limits and extent of cortical plasticity following recovery from stroke.
- Basic work on stereotypes, stereotyping and cognitive processing have led to insights about how the medical care system provides unequal treatment to racial minorities even when there is little evidence of external racial bias,
- Research shows that attitudes resulting from strongly persuasive messages are less stable than attitudes based on experience, holding implications for the long-term effectiveness of therapeutic approaches.

It is evident that impressive scientific gains have been made over the past decade in understanding the function of neural circuitry in the brain, neurotransmitters, and genes. Moreover, methodological advances (e.g., in functional magnetic resonance imaging) allow far more precise measurement of biological and genetic factors that contribute to processes of disease and health. However, it is important to note that the application of these scientific advances to the amelioration of disease will most certainly require a much better understanding of the ways that genes, neural circuits, and neurotransmitters impact behavioral and social processes. For this promise to be fulfilled, new methods, theories, and understanding of social and behavioral functions will need to be developed that will be appropriate for linking with the

actions of particular groups of genes and particular neural circuits. At a much more macro level, it is equally clear that environmental contexts and psychological, social, and cultural processes facilitate or constrain vulnerability to disease, risk-taking behaviors, health promotion, proper health care, and re-entry into community living. Figure 1 illustrates the different levels of basic research across environmental context, social position, social and psychological processes, and biological and cellular processes. Figure 1 also shows how basic research in behavioral and social sciences can foster interventions at different levels.

Figure 1. Levels of Causation for Health



Adapted from McKinlay, J. B., & Marceau, L. D. (2000). Public health matters. *American Journal of Public Health*, 90, 25-33, p. 29.

Current Basic Research Portfolio

The Working Group reviewed the current NIH research portfolio in the area of basic behavioral and social sciences research. Institutes and Centers (ICs) provided the Working Group with funding levels and narrative descriptions of the programs within the individual ICs (Attachment E). It is clear that there are a number of strong and vibrant programs that contribute to basic scientific knowledge in this area and support research that forms the foundation for our understanding of the disease etiology and health promotion. It is also clear that many other NIH institutes do not support much, if any, basic behavioral and social science research. The ICs with notable strength in basic behavioral and social science research include the National Institute on Aging, the National Institute on Child Health and Human Development, the National Institute on Drug Abuse, the National Cancer Institute, the National Institute on Alcoholism and Alcohol Abuse, the National Heart, Blood and Lung Institute, and the National Institute of Mental Health. The Working Group applauds these ICs for their past support of basic behavioral and social science research relevant to the NIH mission and encourages them to continue and expand this support. However, it is important to note that all of these institutes that have been supporting basic behavioral and social science research are either linked to a particular developmental period (NIA and NICHD) or a particular set of diseases. There is a clear need for a home for basic behavioral and social science research that is critical for the NIH mission but does not fit into the framework of a particular developmental period or disease.

Opportunities for Funding in Basic Behavioral and Social Sciences at the NIH

While the existing programs have provided important support for basic behavioral and social sciences research, there are many untapped opportunities. Although a comprehensive review is beyond the scope of this Working Group, we identified examples of opportunities that are ultimately likely to make important contributions to understanding and improving health outcomes. These opportunities also demand studies of the biological mechanisms involved.

Macro-Social Behavior

- Social integration and social capital
 - Changes in technology and mobility can undermine neighborhood social networks which, in turn, affect individual capacity for resilience, effectiveness, and connectedness, with implications for health behaviors and health outcomes, all of which need investigation.
 - High levels of immigration have recently altered U.S. race and ethnic relations, changing health outcomes at the level of individual lives, communities, and the Nation. Understanding these dynamics will protect the health of all Americans, old and new, as well as visitors.
- Work-related stresses
 - More demanding jobs and new economic forms challenge the idea of a fixed workplace and its relation to the community, which then impacts work-related stresses, family cohesion, and health; these changes need further study.

- As women have entered the labor force in advanced industrial societies, conflict between work and family has increased, with effects on social stress, human functioning, and health, in ways not fully known.

Social and Interpersonal Behavior

- Stigma and discrimination
 - Prejudice and discrimination create stressors for both perceiver and target; for example, both hate crimes and everyday ethnic incivility pose physical and mental risks via direct stress for targets, indirect stress for other members of target groups, and stress for perpetrators. We need to understand the social processes and biological mechanisms involved.
 - Stigmatization and consequent avoidance of and exclusion from optimal healthcare delivery leads to disparities in health care, perhaps accounting for some health disparities across racial and ethnic groups. This situation needs further study.
- Well-being
 - Well-being depends on motives beyond self-interest, including secure belonging, socially shared understanding, efficacy, self-affirmation, and trust. Studying these motivations can promote healthy behavior, which accounts for enormous differences in individual health outcomes.
 - Self-regulation of emotion, cognition, and behavior depends on a range of genetic, developmental, personality, and social factors, with clear implications for a variety of health behaviors. What factors affect self-regulation? Under what conditions is it impeded or facilitated?
 - Social phenomena affect health and functioning via physiological pathways that might include stress and recovery processes, immune function, endocrine function, and inflammation. We are just beginning to understand the processes involved.
 - Interpersonal processes, memory and executive functions, and emotion systems overlap and combine, suggesting that interdisciplinary teams can address the complex stimuli, complex decisions, and complex environments typical of health behavior.

Perception, Learning, Emotion, and Cognition

- Exercise and cognition
 - Regular moderate exercise improves cognition and prevents onset of Type 2 diabetes, which is a risk factor for dementia. The behavioral and biological mechanisms need to be investigated.
 - People's representations and regulation of habits such as exercise routines and driving may help explain who, when, and how such routines are adopted and endure.
- Fear, anxiety and vigilance
 - Amygdala, hippocampus, and prefrontal cortex operate in long-lasting learning and extinction, with neuronal mechanisms potentially being uncovered at the molecular and cellular levels.
 - Broad mechanisms of arousal, vigilance, and readiness for action follow from basic neural studies of fear, with implications for behavior in emergencies (e.g., accidents

and heart attacks) and in expected but aversive events (e.g., unpleasant medical procedures).

- Emotion, health, and disease
 - The role of stress and emotion in a host of disease states and in the progression of disease-related processes such as immunity and healing has been established.
 - Problems with the regulation of specific emotions have been linked to specific disease processes, such as the role that anger and hostility play in coronary artery disease and hypertension.
 - More precise and differentiated measures of emotional functioning have provided more accurate measures of emotional dysfunction in a range of psychiatric diseases (e.g., schizophrenia, autism) and neurological diseases (e.g., Alzheimer's disease, frontotemporal lobar degeneration) that may provide early warning signs, identify important subtypes, and help monitor improvement with treatment.
- Memory and the life course
 - Short assessment techniques allow physicians to screen for dementia during medical visits. Development of reliable, predictive, easy-to-administer measurement is vital.
 - Older people better remember positive information than negative, pointing to ways to improve the effectiveness of public health messages and holding implications for the assessment and treatment of trauma.
 - Studies combining molecular and cellular techniques with behavioral assessment in animal models are uncovering fundamental mechanisms for memory as well as for disruption of memory in mild cognitive impairment and dementia; these findings are complemented by non-invasive imaging to assess brain regions involved in memory and to follow degenerative processes in the living human brain.
- Perception and behavior
 - Better understanding is needed of the representation of the sensory world in the brain and how that representation leads to behavior.
 - Behavioral studies of perception help develop visual and motor prostheses, improve instrumentation for both normal and impaired individuals, and create training for people losing perceptual capabilities (e.g., age-related macular degeneration) Basic research on perception lays the groundwork.
 - Research on spatial orientation leads to innovations that help people of varying abilities and disabilities navigate space. Novel technologies such as virtual environments promise new insights.
 - It is profoundly important to understand how the brain acquires and retains information. Recent developments in theory and measurement provide opportunities for advances in understanding neural plasticity and regeneration.

Early Development

- Infant temperament
 - Observation and neuro-imaging of young children delineate early individual differences in sensory and emotional processing, with influences over-time on

- development, socialization, and mental and physical health. These differentials need to be explored
- In studies of primate foraging, maternal anxiety and care influence offspring emotionality, with long-term changes in brain regions such as hippocampus. Studies of the relationship between early parenting and brain development hold promise for better understanding of the impact of the social environment on brain development.
- Intergenerational transmission of behavior
 - Behavioral transmission to offspring mediates transgenerational effects on emotionality, which include methylation of DNA, indicating long-term effects on gene expression. We have much to learn about these processes.
 - Cycles of child abuse (abusees becoming the abusers) decreases in individuals possessing alleles of the monoamine oxidase A gene. Why is this the case?
 - Infant pattern recognition
 - Infants rely heavily on detecting correlations between events (pattern detection) to process information, acquire language, and guide behavior. Children at genetic risk for autism and learning disorders apparently fail to understand the salience of such correlations and are unable to attach meaning to patterns. Research on normal perception will be instrumental in early detection and possibly interventions in these serious mental disorders.

Gene-Environment Interactions

- Biology of resilience
 - Genetics and neurobiology of resilience can show vulnerabilities associated with certain genetic traits, early life experiences, and later health habits such as exercise thus, it is important to understand the links among them.
- Precursors of obesity
 - Brain activation patterns to food presentation differ in lean individuals versus obese and recovered obese individuals, which strongly suggest genetic and early life programming during a window of development.
- Biosocial stress markers
 - Vulnerability to depression after a major stressful life event increased in subjects having the short form of the serotonin transporter gene. More understanding is needed to aid diagnosis of vulnerabilities and the mechanism of depression.
 - Chronic stress remodels the brain: it increases amygdala neuron branching, suppresses neurogenesis and branching of dendrites in the hippocampus, and suppresses branching of dendrites in the prefrontal cortex. Results from rodent models resemble structural changes in the human brain in depressive illness. To understand the effects of stress on long-term cognitive and affective reactions, we need to understand the neurological effects.

- **Technology, Measurement and Methodology**
 - Development of technology and methods for collecting biophysical data (biomarkers) in the population setting vastly expands the possibility of deciphering multi-level pathways linking biology, behavior, environment and society.
 - While recent advances in knowledge about the genome have spurred interest in gene-environment interactions, progress will be made only with further investment in research to develop measures to better characterize the relevant social and physical environments.

Cutting Across More Than Two Levels

Some of the most pressing questions about health and illness now facing us involve processes at the level of the population or social group, the individual, organ systems, and the cell. Major advances in understanding these questions will require the skills and collaboration of scientists across a range of disciplines. This will require the integrated training of scientists in biological, behavioral and social sciences. Below we discuss several examples of these overarching challenges and the opportunities for addressing them.

Health disparities continue to be a priority for the NIH. The focus has expanded to include racial/ethnic, socioeconomic and rural/urban disparities in health outcomes. Epidemiological, sociological and demographic studies have revealed linear gradients of morbidity and mortality across socioeconomic status (SES), as reflected in educational attainment or income, which cannot be explained by such factors as smoking or access to health care. The linearity means that these health disparities reach the middle of the SES range, and are not confined to those people with the lowest SES. Moreover, evidence shows that regions of the United States and other nations that show greater gradients of income distribution also show greater effects on such endpoints as mental health and mortality. Racial and ethnic differences also impact health. Clearly, the processes that produce health disparities involve stratification in societies, differential treatment of individuals and social groups, day-to-day interactions among individuals, and affective and physiological responses. New biological and behavioral assessment tools are now available to examine how these gradients “get under the skin” and affect measures of health and quality of life across the life course.

Obesity, diabetes and mood and affective disorders are a growing concern at the NIH. These disorders show disparities across SES and reflect the multiple social, behavioral and biological influences across the lifecourse that must be better understood in order to develop effective treatments. In terms of behavioral treatments, one example is regular, moderate exercise, which has been shown to reduce the incidence of Type II diabetes and to improve executive function and attention, and to have antidepressant effects along with promoting neurogenesis and enhancing neurotrophin levels in the brain. In addition to the physical activity per se, the exercise intervention is also likely to promote social integration and to have other psychological benefits to the participants.

Events early in life play an important role in predisposition to disorders such as obesity, diabetes and mood and affective disorders, but the relevant mechanisms are not well understood

and need intensive inter-disciplinary investigation. Furthermore, data show that early life interventions both in the home and in "head start"- type programs can help to improve both parenting skills as well as the socialization of the children and their readiness to learn. These types of interventions deserve much more emphasis and intensive study, along with implementation of programs such as the "Experience Corps" in Baltimore which brings older adults into schools to assist in the classrooms and school programs. In addition to improving behavior and learning among the children, these programs also benefit the health of the older adult teacher-assistants in similar ways to the benefits of regular exercise. They also improve mood by providing a purpose for living. The social, behavioral and biological aspects of these programs need to be better understood and require collaboration among biological, behavioral and social scientists.

Recommendations

Support for basic behavioral and social science research is critical for advancing the NIH mission. Recent advances in molecular, genetic, and neural areas will create an even greater demand for advances in basic behavioral and social science research if these advances are going to be successfully translated to improving the nation's health and reducing the burden of illness. Although some basic behavioral and social science research is likely to continue to find a home in the ICs where it is seen as meshing with existing programs and priorities, other research-- while extremely germane to the NIH mission-- is unlikely to find a funding source under the current structure. Moreover, as the recent policy and priority shifts within ICs make clear, the current support structure for basic behavioral and social science at NIH is fragile, pointing to the need for a secure and stable home for this important research.

By providing a secure and stable home for basic behavioral and social science research at NIH, the translation of this important research to health and disease applications will be greatly facilitated. We anticipate that this will dramatically enhance the integration of basic and applied research in the behavioral and social sciences at the NIH.

In order to achieve these goals, the Working Group makes two general recommendations, each elaborated in greater detail below:

Recommendation 1: A secure and stable home should be established at NIH that can serve to foster basic behavioral and social sciences research that is not closely linked to the missions of the categorical Institutes and Centers. This will require both staff with appropriate expertise in the behavioral and social sciences and budget sufficient for the task.

Recommendation 2: The basic behavioral and social science research programs that are currently functioning well within ICs should continue in their present form. Efforts should be made to encourage basic behavioral and social science researchers whose research is applicable to specific diseases, conditions, or developmental periods to seek support from the relevant ICs.

The goals of providing a secure and stable home for basic behavioral and social science research at NIH and ensuring NIH-wide support of training in the basic behavioral and social sciences can be achieved most effectively through a two-pronged strategy, the Working Group believes. This strategy centers on OBSSR and an existing non-categorical Institute.

OBSSR

OBSSR would be given increased planning and budget authority for basic research in the behavioral and social sciences at NIH that fits within existing ICs. OBSSR would help develop priorities for basic behavioral and social science research, in conjunction with ICs, and with the advice of the research community. OBSSR would maintain a continuing review of the grants portfolios of ICs in basic behavioral and social science research. It would work with the staff at various ICs to develop research initiatives consistent with the research priorities and would allocate funds to ICs for these initiatives. These research initiatives would then be communicated to the research community by staff and public announcements in a top-down approach to encouraging basic behavioral and social science research.

Because this recommendation would necessitate an increase in the staffing and funding for OBSSR, the Working Group recommends that NIH seek appropriations from Congress for this purpose.

The Office of AIDS Research provides an organizational model for this kind of structure. OAR has responsibility for a sizeable budget but, funds no grants directly. Rather it works with staff of ICs to develop funding priorities, which are then built into future budget requests.

The Working Group feels that this part of the recommended solution has a number of important advantages. OBSSR would start this effort from a strong base of scientific expertise in basic behavioral and social science research. OBSSR is well positioned to review and evaluate the basic behavioral and social science research portfolios of ICs, providing a trans-NIH perspective and program. The Office has close working relations with staff in ICs on which to build this new program. The Office currently works with ICs to develop research initiatives, allowing for an extension and expansion of the current efforts to basic research.

However, the proposed solution leaves investigators who would like to propose research projects in basic behavioral and social science for NIH funding with no obvious Institute to which to submit proposals. OBSSR funds no investigator-initiated grants directly and does not have organizational structures in place to administer a sizeable program of investigator-initiated research in basic behavioral and social sciences. The Working Group recommends that such a research program be established in an existing Institute with the administrative and organizational structures to support such research.

Investigator-Initiated Research in Basic Behavioral and Social Science

Basic behavioral and social science research that is not linked to a disease or a developmental period has no source of funding within the current structure of NIH. The Working Group

recommends that a home within an existing non-categorical Institute be established for basic behavioral and social science research that does not fit within the current IC structure. This would allow the direct funding of basic behavioral and social science research by an institute, building on a great deal of generic experience in developing, managing and funding research. This model has worked well for basic biological research, which is currently supported within NIGMS, and might provide an organizational model for this recommendation. NIGMS, NIA and NICHD are examples of existing non-categorical ICs that could provide a stable and supportive home for basic behavioral and social sciences research.

A non-categorical institute, well-established, and devoted to basic science, with considerable resources would have much to recommend it. Moreover, such an institute also has the structures in place that could support a new section on basic behavioral and social science-- separate grants management, grants oversight programs, links to peer review. Such an institute requires staff familiar with basic behavioral and social sciences research and an organizational structure for dealing with such research. In building this capability at an existing institute, the advice and assistance of OBSSR and the other NIH institutes that have historically funded basic behavioral and social research would be invaluable.

The Working Group recommends that any needed appropriations for the additional staffing and program development that would be needed at to establish such a program be sought from Congress.

REVIEW: The Working Group was also given responsibility for considering issues regarding the review of basic behavioral and social sciences research. The interdisciplinarity of a large portion of the basic research opportunities presents unique challenges for review of the applications, including the development of a pool of reviewers with integrated training in biological, behavioral and social sciences. Also, the changing assessment of where the cutting edge research is occurring in the basic area requires constant evaluation to ensure that the review remains appropriate to the task of finding the most innovative and scientifically meritorious applications. The Working Group recommends that the organization charged with overseeing the research and training in basic behavioral and social sciences research work closely with the Center for Scientific Review to assess the existing review of basic behavioral and social sciences research and ensure that as the area continues to develop the review remains appropriate to the changing array of applications.

Attachment A

Basic Research

OMB Definition: Basic research is defined as systematic study directed toward fuller knowledge or understanding of the fundamental aspects of phenomena and of observable facts without specific applications toward processes or products in mind.

Basic research in the behavioral and social sciences is designed to further our understanding of behavioral and social functioning. As is the case for basic research in the biomedical sciences, basic behavioral and social sciences research does not address disease outcomes per se, but is designed to elucidate behavioral and social phenomena. Consequently, basic research may provide essential knowledge necessary for better prediction, prevention, and control of illnesses.

Basic behavioral and social research is divided into three categories: (A) research on behavioral and social processes; (B) biopsychosocial research; and (C) research on the development of behavioral or social procedures for measurement, analysis, and classification.

A. Research on behavioral and social processes involves the study of human or animal functioning at the level of the individual, small group, institution, organization, community or population. At the individual level, this research may involve the study of behavioral factors such as cognition, memory, language, perception, personality, emotion, motivation, and others. At higher levels of aggregation, it includes the study of social variables such as the structure and dynamics of small groups (e.g. couples, families, work groups, etc.); institutions and organizations (e.g. schools, firms, religious organizations, etc.); communities (defined by geography or common interest); and larger demographic, political, economic, and cultural systems. Research on behavioral and social processes also includes the study of the interactions within and between these levels of aggregation, such as the influence of sociocultural factors on cognitive processes or emotional responses. Finally, this research also includes the study of environmental factors such as climate, noise, environmental hazards, and residential environments and their effects on behavioral and social functioning and vice versa.

B. Biopsychosocial research (also known as biobehavioral or biosocial research) involves the study of the interactions of biological factors with behavioral or social variables and how they affect each other (i.e., the study of bidirectional multilevel relationships). Examples of research topics include: behavioral genetics, behavioral and cognitive neurosciences, psychoneuroimmunology, psychopharmacology, and behavioral cardiology.

C. Research on the development of procedures for measurement, analysis, and classification involves the development and refinement of procedures for measuring and analyzing behavior, psychological functioning, or the social environment. This research is designed to develop research tools that could be used in other areas of behavioral and social sciences or in biomedical research.

Examples of research topics in the area include: statistical modeling techniques; memory assessment; behavioral observation procedures; psychometric analysis of self-report instruments; qualitative and ethnographic methods; neuropsychological assessment; psychophysiological methods; pain assessment; and instruments for determining dietary intake; and assessment of medical adherence.

Attachment B

Working Group of the NIH Advisory Committee to the Director on Research Opportunities in the Basic Behavioral and Social Sciences

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Attachment C

Charge to the Working Group on Research Opportunities in the Basic Behavioral and Social Sciences

As part of the examination of basic behavioral and social sciences across the NIH, the NIH Director is establishing this working group of the Advisory Committee to the Director (ACD), NIH. This Working Group is chaired by a member of the ACD and consists of outside experts charged to:

- 1) Address issues related to NIH's support for research in the behavioral and social sciences that is fundamental to the prevention, treatment, and cure of illnesses but is not directed at a specific disease or condition. Specifically to:
 - review the existing portfolio of basic behavioral and social sciences research across the NIH;
 - identify areas of opportunity in basic behavioral and social sciences, consistent with NIH's mission, that NIH should consider supporting; and
 - examine the barriers to the submission and peer review of grant applications in the basic behavioral and social sciences.
- 2) Make recommendations for improving the basic behavioral and social science program of the NIH.
- 3) Complete the review and development of recommendations in the Fall of 2004.
- 4) Provide recommendations to the Advisory Committee to the Director, NIH, for deliberation and final recommendations to the Director, NIH.

Attachment D: Congressional Action on Behavioral Research at the National Institute of General Medical Sciences (NIGMS)

Purpose	Year	Law/Bill No.	Directive from Report	NIH Action to be Taken
Establishment	1962	P.L. 87-838 Sec. 442	“Establishment of Institute of General Medical Sciences. Sec. 442. The Surgeon General is authorized, with approval of the Secretary, to establish in the Public Health Service an institute for the conduct and support of research and research training in the general or basic medical sciences and related natural or behavioral sciences which have significance for two or more other institutes, or are outside the general area of responsibility for any other institute, established under or by this Act.”	
Current Codified Mission Statement	1985	42 U.S.C. §285k	“The general purpose of the National Institute of General Medical Sciences is the conduct and support of research, training, and, as appropriate, health information dissemination, and other programs with respect to general or basic medical sciences and related natural or behavioral sciences which have significance for two or more other national research institutes or are outside the general area of responsibility of any other national research institute.” (July 1, 1944, ch. 373, title IV, Sec. 461, as added Pub. L. 99-158, Sec. 2, Nov. 20, 1985, 99 Stat. 857.)	
Appropriations	FY 1999	Senate Report 105-300 ¹	“Behavioral science research and training.-The Committee encourages NIGMS to support basic research training as part of its mandate to support basic research training in all areas of health-related research.”	NA

¹ Unless otherwise noted, if no House Report language appears in a fiscal year, this means the accompanying House Appropriations report did not contain basic behavioral language.

Appropriations	FY 2000	<p>House Report 106-370</p> <p>Senate Report 106-166</p>	<p>“Behavioral Research and Training.-There is a range of basic behavioral research and training that the institute could support, such as the fundamentals [sic] relationships between the brain and behavior, basic cognitive processes such as motivation, learning, and information processing, and the connections between mental processes and health. The Committee encourages NIGMS to support basic behavioral research and training and to consult with the behavioral science research community and other Institutes to identify priority research and training areas.”</p> <p>“Behavioral Sciences Research and Training.- The Committee is concerned that NIGMS does not support behavioral science research training. As the only national institute specifically mandated to support research not targeted to specific diseases or disorders, there is a range of basic behavioral research and training that NIGMS could be supporting. The Committee urges NIGMS, in consultation with the Office of Behavioral and Social Sciences, to develop a plan for pursuing the most promising research topics in this area.”</p>	<p>HHS-FY 2001 Appropriations justifications:</p> <p>“A number of NIH institutes support basic behavioral research and research training. Primary among these are the National Institute of Neurological Disorders and Stroke, and the National Institute of Mental Health. Supporting explorations of the relationships between the brain and behavior, studies of basic cognitive processes, and examinations of how mental processes contribute to development and health is central to the missions of these institutes and they devote considerable resources to research and research training in basic behavioral areas. NIGMS support for training is linked to the areas of science supported by the Institute, and the behavioral fields mentioned above are not part of the Institute’s research mission. Training in these areas should be supported by institutes with sizable behavioral research programs. A major new research or research training effort in basic behavioral sciences by NIGMS would be duplicative and inappropriate. A few of the institutions supported through NIGMS’ Systems and Integrative Biology training grant program offer participants opportunities to pursue training in the basic behavioral sciences. In addition, individuals supported under the Institute’s Medical Scientist Training Program (which leads to the M.D.-Ph.D. degree) may pursue research training in behavioral sciences if their institution offers that option. In both cases, the grantee institution chooses to offer this option as part of the multidisciplinary training mandated for all of NIGMS’ training programs.</p> <p>The Office of Behavioral and Social Sciences Research is convening a working group of institute representatives to examine how the NIH might best pursue future research training efforts in the behavioral sciences. NIGMS will participate on that working group, which expects to begin its work early in 2000.”</p>
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Appropriations	FY 2001	Senate Report 106-293	<p>“Behavioral Science Research and Training.- The Committee is concerned that NIGMS does not support behavioral science research training. As the only Institute mandated to support research not targeted to specific diseases or disorders, there is a range of basic behavioral research and training that NIGMS could be supporting. The Committee urges NIGMS, in consultation with the Office of Behavioral and Social Sciences, to develop a plan for pursuing the most promising research topics in this area.”</p>	NA
Appropriations	FY 2002	Senate Report 107-84	<p>“Behavioral Science Research and Training.- The Committee is concerned that NIGMS does not support behavioral science research training. As the only Institute mandated to support research not targeted to specific diseases or disorders, there is a range of basic behavioral research and training that NIGMS could be supporting. The Committee urges NIGMS, in consultation with the Office of Behavioral and Social Sciences, to develop a plan for pursuing the most promising research topics in this area.”</p>	<p>HHS FY 2003 Appropriations Justifications-NIGMS: “The Institute’s research training programs mirror the areas of science that fall within the mission of the National Institute of General Medical Sciences (NIGMS). Except for a few fields of inquiry, behavioral studies largely fall outside of the Institute’s research mission, and are instead deemed to be within the missions of other institutes at the National Institutes of Health. The National Institute of Mental health (NIMH), as well as a number of others with missions focused on diseases, support both basic behavioral research and behavioral research in humans, since many disease states have behavioral dimensions. As is customary at the NIH, behavioral research training programs are mounted by those institutes with sizable behavioral research programs. A major new research or research training effort based in behavioral sciences by NIGMS would be duplicative and inappropriate. A few of the institutions supported through NIGMS’ Systems and Integrative Biology (SIB) training grant program offer participants opportunities to pursue training in the basic behavioral sciences. NIGMS intends to highlight this option of including behavioral science departments in SIB training programs when it reannounces [sic] its training programs in the coming months. In addition, individuals supported under the Institute’s Medical Scientist Training Program (which leads to the M.D. - Ph.D. degree) may pursue research training in behavioral sciences if their institution chooses to offer this option as part of the</p>

				<p>multidisciplinary training mandated for all of NIGMS' training programs. NIGMS's individual fellowship support extends to fellows working on the molecular and genetic basis of behavior. In the past, some fellows have studied movement, sensation, and perception.</p> <p>With regard to research, NIGMS supports studies, primarily in model systems, to examine the genetic and biochemical mechanisms underlying behavior. This includes research on the mechanisms underlying specific behaviors related to circadian rhythms, learning and memory, sensation and perception, pain and its management, and analgesia and anesthesia.</p> <p>NIGMS is exploring new areas of opportunity. Together with the Office of Behavioral and Social Sciences Research (OBSSR), NIGMS will soon host a workshop to explore whether it is an opportune time to study how allostatic load (that is, the cumulative "wear and tear" on the body's adaptive responses to stress) influences an individual's reaction to traumatic or surgical injury. Also in a joint effort with OBSSR, NIGMS is exploring the feasibility of supporting Ph.D. biomedical students who wish to receive a Masters degree in the behavioral sciences enhancing their ability to conduct research in that field or in relevant interdisciplinary fields."</p>
Appropriations	FY 2003	Senate Report 107-216 ²	"Behavioral sciences research and training.-As the NIH Institute most concerned with basic research, the NIGMS has provided leadership in basic research on physiological and biological structures and functions that may play roles in numerous health conditions. The Committee encourages the NIGMS to develop collaborations with other Institutes, such as the NCI and NIMH, and the Office of Behavioral and Social Sciences Research to fund basic research to integrate physiological knowledge of pre-disease pathways with behavioral studies."	<p>HHS FY 2004 Appropriations Justifications:</p> <p>"The following section represents FY 2003 Congressional requirements for reports and significant items derived from Senate Report 107-216. These actions discussed below are contingent on inclusion of similar language and funding in the final FY 2003 appropriation and related reports. Additional items may be transmitted at a later date as a result of the final Conference report."</p>

² For FY 2003, the House did not mark up a bill and so there was no House report.

				<p>“The NIGMS primarily supports fundamental areas of biomedical science of a structural or functional nature, which provide the foundation for disease-targeted studies by the other components of the NIH. NIGMS supports a limited number of studies in the area of behavioral research using animal models. Such work is relevant to the study of more complex behaviors in higher organisms supported by other institutes at the NIH.</p> <p>Research training in the behavioral sciences is supported through NIGMS’ Medical Scientist Training Program, Systems and Integrative Biology training program, and programs of the Minority Opportunities in Research Division. All of these programs solicit applications for research training support in a broad range of disciplines, explicitly including the behavioral and social sciences.</p> <p>The NIH Office of Behavioral and Social Sciences Research (OBSSR) has proposed to the Director, NIH that an examination of how NIH might best pursue future research and research training efforts in the basic behavioral and social sciences be conducted. The OBSSR proposal envisioned that a working group of institute representatives will be convened in 2003. NIGMS would participate on that group.”</p>
Appropriations	FY 2004	Senate Report 108-81	<p>“Behavioral Research.-The Committee believes that NIGMS has a scientific mandate to support basic behavioral research because of the clear relevance of fundamental behavioral factors to a variety of diseases and health conditions. The Committee encourages the NIGMS to incorporate basic behavioral research as part of its portfolio, especially in the areas of cognition, behavioral neuroscience, behavioral genetics, psychophysiology, methodology and evaluation, and experimental psychology.”</p>	NA

			<p><i>“Pre-Disease Pathways-</i> The Committee encourages the NIGMS to collaborate with other Institutes, including NCI and NIMH, and the Office of Behavioral and Social Sciences Research to fund research to integrate physiological knowledge of pre-disease pathways with behavioral studies.”</p>	
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