

April 19, 2010

The Honorable John Holdren
Co-Chair
President's Council of Advisors
on Science and Technology
White House
1600 Pennsylvania Ave. NW
Washington, DC 20500

The Honorable Eric Lander
Co-Chair
President's Council of Advisors
on Science and Technology
Professor of Biology, MIT
Director, Broad Institute, MIT
7 Cambridge Center
Cambridge, MA 02142

The Honorable Harold Varmus
Co-Chair
President's Council of Advisors
on Science and Technology
President, Memorial Sloan-Kettering Cancer Center
1275 York Ave.
New York, NY 10065

Dear Drs. Holdren, Lander, and Varmus:

As organizations committed to seeing science contribute to this nation's progress and prosperity, we appreciate your leadership in addressing important science policy issues and write to raise your awareness about one issue in particular. This is a culture-of-science problem that could harm the progress of science as a whole if not addressed. The issue is not new, but it is emerging again in the context of heightened attention to science, technology, engineering, and mathematics (STEM) education.

Virtually every scientific society recognizes the importance of exciting and engaging young people in science, and uniting behind this goal is necessary if we want to succeed. The behavioral and social sciences, including the field of education research, are part of the larger family of science and must also be recognized for their role in a broad STEM education curriculum. Unfortunately, the science and science policy communities have been inconsistent in acknowledging the role of the behavioral and social sciences in STEM education, and we hope that you will take the lead in affirming that *all* sciences are needed for the nation to address the nation's many challenges.

The behavioral and social sciences are an important part of STEM for the following reasons:

(1) The Behavioral and Social Sciences Are Critical to the Nation's Prosperity and the Well-Being of its Citizens

Research in the behavioral and social sciences will lay the foundation for addressing society's most pressing challenges in education, energy conservation, healthcare, crime prevention, human conflict, innovation, and confidence in economic markets. For example, the development and progression of many illnesses and health problems, from cancer, heart disease, and HIV to diabetes and childhood

obesity, depend on behavior, and behavior is fundamentally affected by interactions with other people. Additionally, theory and research growing out of the behavioral and social sciences are playing a critical role in research that crosses disciplinary boundaries. As a result, knowledge acquisition in the behavioral and social sciences increasingly requires advanced technical expertise. The study of human thought processes, for example, now involves the use of fMRI, MEG, and EEG – tools whose scientific purpose is to understand the workings of the mind. As part of STEM, the behavioral and social sciences are positioned to attract the next generation of scientists into these important areas of study. The federal government must have a comprehensive investment in *all* areas of science and science education to sustain America’s competitiveness.

(2) The National Academy of Sciences Recognizes the Need for Sustained Investment in the Behavioral and Social Sciences to Remain Competitive

The National Academy of Sciences, in *Rising Above the Gathering Storm*, made clear that the United States needs to continue its investment in *all* sciences in order to maintain its lead in science and technology and allow it to compete successfully in the 21st century, while also giving needed attention to basic research investments in particular areas, investments that, according to the report, should be evaluated on a regular basis. Included in a recommendation to strengthen the nation’s investment in long-term basic research was an action item, which stated:

“Special attention should go to the physical sciences, engineering, mathematics, and information sciences and to the Department of Defense basic-research funding. *This special attention does not mean that there should be a disinvestment in such important fields as the life sciences or the social sciences. A balanced research portfolio in all fields of science and engineering is critical to U.S. prosperity. Increasingly the most significant new scientific and engineering advances are formed to cut across several disciplines [emphasis added].* This investment should be evaluated regularly to realign the research portfolio to satisfy emerging needs and promises – unsuccessful projects and venues of research should be replaced with research projects that have greater potential.”

The nation must invest in particular areas of science where it is losing ground, but in doing so, the United States cannot afford to lose ground in other areas of science or to devalue areas of science so vital to the capacity building of our nation.

(3) Children Can Become Engaged in Many Areas of Science Through Educational Experiences in the Behavioral and Social Sciences

The NAS report, *Rising Above the Gathering Storm*, recommended that efforts be made to “increase America’s talent pool by vastly improving K-12 science and mathematics education.” There are suggested action items to provide scholarships to recruit science and mathematics teachers, expand training and education programs, and create incentives for students to pursue advanced work in science and mathematics. The scholarship program, in particular, would provide an award for bachelor’s degrees in the physical or life sciences, engineering, or mathematics.

Targeted investments to recruit teachers and students in particular areas may be needed; however, the nation’s science leaders should exercise caution in assuming that students cannot become engaged in science through classroom, lab experiments, or field work in a wide range of sciences, including the behavioral and social sciences. Indeed, the pathways to careers in science are not fully understood. Providing opportunities for students at all levels to explore the full range of sciences and become engaged at any point with any science will help us build the foundation for the 21st century. The briefest reflection on the challenges we face in the United States and world-wide makes vivid that we

will need all sciences to compete successfully. Further, advances in science that reach across disciplines will require all the knowledge, tools, and technologies at our disposal.

(4) Behavioral and Social Sciences Contribute to STEM as Core Sciences *and* Through the Application of these Sciences to STEM Education

The behavioral and social sciences are viewed, at present, as playing a largely supportive role in STEM education. The view is that applying the theories, methods, and models of the behavioral and social sciences will advance education and learning in the mathematical and physical sciences. There is recognition that behavioral and social sciences research can improve our understanding of cognitive reasoning, the impact of contextual factors such as poverty and enriched home environments on children's academic attainment and achievement; and the influence of teachers with substantive science knowledge on children's test scores, to name a few areas, but the interest in this work is in a limited band of scientific literacy. There is far less awareness of a science underlying all of these questions—a science that is itself part of STEM.

Over many decades, from the first inclusion of the social and behavioral sciences at NSF in the mid-1950s, Congress and federal agencies have increasingly recognized the significant contributions that can be made through investments in these sciences. Specifically, the NSF recognized the important role of the social and behavioral sciences when, in 1991, it created a research directorate (one of seven NSF directorates) to facilitate fundamental research in these sciences. A few years later, in 1993, Congress established the Office of Behavioral and Social Sciences Research in the Office of the Director at the National Institutes of Health. Today, according to reports to Congress, NIH provides about \$3 billion in funding to support behavioral and social sciences research across the agency because it sees this research as necessary to fulfill its mission of improving the health of the nation.

Likewise, the Department of Defense and national security agencies are increasingly calling upon the behavioral and social sciences to understand complex problems that they face. In his April 2008 speech to the Association of American Universities, Secretary Robert Gates indicated that it was time to enhance the Defense Department's support for university research, much of it in the behavioral and social sciences. A National Academies' report, *Human Behavior in Military Contexts*, reinforces the importance of these sciences to the nation's security. The Science and Technology Directorate at the Department of Homeland Security also recognizes the importance of the social and behavioral sciences through its Human Factors division and its support for the Center of Excellence on the Study of Terrorism and Response to Terrorism housed at the University of Maryland.

Research in the behavioral and social sciences is addressing many questions related to national security. For example, how should the government train intelligence analysts or soldiers so that they can optimally sift through large amounts of information (verbal, written, spatial), identify what is important, and make decisions quickly? Also, how should the United States interact with local leaders and populations in high-risk areas to reduce conflict and build trust in order to reduce the likelihood that young men and women will be drawn to terrorist groups?

Further, the Department of Education's Institute of Education Sciences has a large research portfolio dedicated to the advancement of research on education and learning. Based on data collected through its National Center for Education Statistics (NCES), education researchers and other behavioral and social scientists with wide ranging expertise are working with large datasets and linking them, where possible, across districts and over time in order to better understand how to improve student educational outcomes. The scientific workforce of the future must have the capacity to undertake such inquiries.

Behavioral and social sciences are part of STEM, and we urge the nation's science leaders to communicate the importance of all the sciences to building a solid foundation for the United States.

(5) The National Science Foundation Has Promoted the Integration of the Behavioral and Social Sciences into STEM and STEM Education

The National Science Foundation has itself invested in improving education in the social, behavioral, and economic sciences (SBE). In 2003, the SBE Directorate held a national workshop on the issue and the following year issued a plan of action for improving SBE science education at all levels of education. According to the NSF-supported report, *Education and Training in the Social, Behavioral, and Economic Sciences: A Plan of Action*, “a recurrent theme is the need for greater acknowledgement that the SBE sciences are an integral part of science, technology, engineering, and mathematics (STEM)... No place is more ripe for building this awareness than in science education itself and, in particular, in K-12 education, where the SBE sciences are conspicuously absent from introductory materials on the nature of science and the identification of phenomena that are amenable to scientific analysis. Public comprehension of the SBE sciences would be greatly advanced by inclusion of the SBE sciences at early stages of science learning.”

The 2003 *Plan of Action* offered systematic and feasible recommendations at each level of science education and emphasized the need for more rather than less attention. The behavioral and social sciences from every vantage of the public interest have much to contribute as an integral part of a broad STEM education curriculum, and this is the time to act. Given the number of students who express interest in the behavioral and social sciences, these fields could potentially serve as a gateway to a career in many scientific areas.

(6) Exposure to Behavioral and Social Sciences in a Broad Science Education Curriculum Can Help Students Develop Critical Thinking Skills

The National Science Board, in its January 2009 STEM education recommendations to the incoming administration, called on this administration to “lead the process of articulating the core concepts and skills that all students should master” and to “help develop assessments that promote student learning in STEM and encourage critical thinking, communication, and problem-solving skills.” The behavioral and social sciences, as part of STEM, can contribute in meaningful ways to developing critical thinking and problem-solving skills in children and, in turn, help the federal government “ensure that [it develops] the talents of all children who have the potential to become STEM innovators or excellent STEM professionals.”

(7) Congress, through the America COMPETES Act, Has Signaled Support for the Behavioral and Social Sciences

The America COMPETES Act does not specifically define STEM, but the Act includes the social sciences in a list of areas the NSF Director must consider in determining how to meet critical national science needs. The Act states:

... the Director shall include consideration of the degree to which awards and research activities that otherwise qualify for support by the Foundation may assist in meeting critical national needs in innovation, competitiveness, safety and security, the physical and natural sciences, technology, engineering, *social sciences* [emphasis added], and mathematics.

The Act also requires the Director to give priority within all of these areas to awards that enhance the competitiveness, innovation, or safety and security in the United States. As with other sciences, the

behavioral and social sciences have much to contribute to U.S. safety and prosperity, and the Act itself appears to direct inclusion in the research and training programs of NSF as a means of keeping the United States competitive and building a solid foundation for the future.

Currently, Congress is considering reauthorization of the America COMPETES Act. Our inquiries indicate that there is no intention to narrow the range of sciences that are part of STEM, but instead to authorize funding and programs that encourage interdisciplinary and multidisciplinary research and education. We fully support these efforts by Congress and encourage the administration to also make clear that all sciences, including the behavioral and social sciences, are necessary to address the nation's many needs.

Science is a universal way of knowing the world, and the scientific method is valid across all domains in which nature is explored. As the nation's science leadership, we call on you to address this culture-of-science problem. The behavioral and social sciences are part of the larger family of sciences needed to address the nation's challenges. We encourage you to affirm this and make clear the need for a broad and robust STEM education curriculum that includes *all* sciences as a way to attract the brightest students and expand the possibilities for engaging them in science.

We would be pleased to work with you in this effort. If we may be of assistance in any way, please do not hesitate to contact Paula Skedsvold, Federation of Associations in Behavioral & Brain Sciences (pskedsvold@fabbs.org, (202) 336-5920) or Howard Silver, Consortium of Social Science Associations (silverhj@coassa.org, (202) 842-3525).

Sincerely,

American Educational Research Association
American Political Science Association
American Psychological Association
American Society of Criminology
American Sociological Association
American Statistical Association
Association for Behavior Analysis International
Association for Psychological Science
Association of American Geographers
Association of American Law Schools
Cognitive Science Society
Consortium of Social Science Associations
Federation of Associations in Behavioral &
Brain Sciences
Human Factors and Ergonomics Society
International Society for Developmental
Psychobiology
Law and Society Association
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Massachusetts Neuropsychological Society
Midwest Political Science Association
National Academy of Neuropsychology
Population Association of America
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Society for Behavioral Neuroendocrinology
Society for Computers in Psychology
Society for Industrial and Organizational
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