

Written Testimony of the American Psychological Association
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United States House of Representatives Committee on Appropriations
Subcommittee on Commerce, Justice, Science, and Related Agencies
The Honorable Alan Mollohan, Chairman

Fiscal Year 2010 Appropriations for the National Science Foundation and National Aeronautics and Space Administration

The American Psychological Association (APA), a scientific and professional organization of more than 150,000 psychologists and affiliates, is pleased to submit testimony for the record. Because our behavioral scientists play vital roles within the **National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA)**, APA will address the proposed FY10 research budgets for both of these agencies:

- **APA recommends that the Subcommittee support the President's FY10 request of \$7.00 billion for NSF.**
- **APA recommends that the Subcommittee support the President's FY10 request of \$18.7 billion for NASA, to allow for substantial increases in NASA Advanced Capabilities (which houses the Human Research Program), and NASA Aeronautics research.**

National Science Foundation
Core Psychological Research at NSF

NSF is the only federal agency whose primary mission is to support basic research and education in math, engineering and science – including the *behavioral and social sciences*. NSF's investment in basic research across these disciplines has allowed for extraordinary scientific and technological progress, ensuring continued economic growth, improvements in the design, implementation and evaluation of public education, strengthened national security, and the generation of cutting edge new knowledge.

APA supports the Administration request of \$7 billion for NSF in FY10, and urges Congress to implement a doubling of the NSF budget over the next ten years. This is consistent with Administration and Congressional plans to invest substantially in federal science agencies with the capacity to stimulate global competitiveness and innovation. Within the overall NSF budget, APA supports a strong investment in psychological research throughout the research and education directorates foundation-wide, in order to address critical national challenges with an understanding of human behavior at their core. The America COMPETES Act specifically noted the importance of funding the

social sciences and this must be reflected in an increase for NSF's behavioral and social science research portfolio comparable to proposed increases for other sciences at NSF.

Although psychologists receive funding from diverse programs within NSF, most core psychological research is supported by the **Social, Behavioral and Economic Sciences Directorate (SBE)**, with its focus on the variables that determine human behavior across all ages, affect interactions among individuals and groups, and decide how social and economic systems develop and change. In addition to core behavioral research in cognitive neuroscience, human cognition and perception, learning and development, and social psychology, SBE also will continue to support the development of science metrics through its **Science of Science and Innovation Policy (SciSIP)** research program. Funding SciSIP research is fundamental to identifying processes by which investments in research are transformed into social and economic outcomes, and providing a more effective evaluation of the “return” on scientific investments.

The **Biological Sciences Directorate** at NSF also provides support for research psychologists who ask questions about the very principles and mechanisms that govern life at the level of the genome and cell, or at the level of a whole individual, family or species. In previous testimony, APA has expressed concern about diminishing support for key behavioral research programs within this Directorate, most notably those focused on learning and cognition. NSF recognizes the importance of learning and cognition to many branches of science already, and supports Foundation-wide initiatives and individual research projects that seek to understand the neural or genetic mechanisms by which learning occurs, that use learning as an assay for the effects of environmental change on a biological system, that construct and evaluate artificial learning systems, that conceptualize the role of learning in biodiversity and evolution and that apply learning principles to education and workforce challenges.

However, we hope that NSF's focus on transformational science will continue to recognize that behavior links everything from molecular biology to ecology because in a sense behavior is the ultimate genetic phenotype. Animals behave to eat, defend and reproduce, so an understanding of how the molecular processes within and beyond the central nervous system lead to behavior and how behavior serves an adaptive function seems essential to integrating biology across levels. Within the field of animal behavior and cognition there are clear demonstrations that this integration is occurring. For example, individual differences in gene expression can now be linked to individual differences in memory, attention, decision making, individual adaptation and fitness. The opportunity for understanding individual differences is unprecedented.

National Aeronautics and Space Administration

Behavioral Research is Critical for Space Exploration and Air Safety

Over the last 20 years, the NASA research budget has gone down steadily, with space exploration expanding at about the same rate. The result is an increasing gap in life sciences and human factors knowledge – knowledge that is critical for successful missions and for improving both the safety and efficiency of our current and future aerospace systems. Longer space missions place increasing demands on psychological health and performance in space. Psychological scientists are meeting

these challenges head on by extending the information management capacity of individuals through computational systems - systems that can sense when the user is overloaded, or determine what needs to be done next and automatically adapt. Such systems improve human decision-making and allow humans to function in extremely challenging environments, such as space flight. The need for science-based practical principles to enhance systems, interfaces, team dynamics, decision-making, training, and psychological health continues to grow, but with a diminishing research budget, NASA behavioral scientists are ill equipped to take on this crucial task.

In 2005, Congress endorsed the Vision for Space Exploration (VSE) to send humans to the moon and then to Mars. An understanding of human performance in space is critical for VSE, and the ability to measure and predict human performance through all mission phases enhances mission safety and mission success. APA urges NASA to prioritize life sciences and human aeronautics research and to restore its support for these programs to a level commensurate with other NASA programs.

In the NASA Authorization Act of 2005, Congress authorized \$18,686,300,000 for FY08. The actual allocation for FY08 shortchanged the agency by over \$1 billion. Although the FY09 appropriation of \$17.8 billion exceeded the FY09 administration request, NASA remains underfunded. The President's FY10 budget will help address these lingering shortfalls. APA supports the President's request of \$18.7 billion for NASA in order for the agency to succeed in moving forward with the Vision for Space Exploration (VSE) while also sustaining its non-Exploration missions.

Human Research Program

Over the past several years, support for programs in the life sciences has diminished significantly, despite a renewed commitment in 2005 to extend human presence in space, and an unprecedented interest in behavioral research. Now, what remains of the Human Research Program is budgeted at \$152 million, an increase of just 3.4% over FY08. Human research must be securely and adequately funded and considered an integral component of space mission planning. A successful overall behavioral health program will require a broad perspective, multiple convergent research strategies, and a variety of settings, including space itself.

Aviation Safety

Aeronautics research (including human factors) has long been a cornerstone of NASA. APA applauds NASA Ames Research Center for its historic attention to human factors research, but continued cuts to aeronautics programming and a recent reorganization of the Aeronautics Research Mission Directorate threaten to dismantle this once world-class center for human factors research. The Aeronautics Research Mission has been re-oriented to emphasize disciplines such as aerodynamics over human performance and operational issues. Further, the diminished spending power of the aeronautics program has forced NASA centers to cut jobs and university grants in aeronautics research, especially in the area of human performance and aviation safety. NASA's continual underfunding of

aeronautics research also poses a significant threat to the Next Generation's (NextGen) schedule and budget.

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