

**National Science Foundation**  
**Directorate for Social, Behavioral and Economic Sciences (SBE)**  
**Fall Advisory Committee Meeting Summary**  
**Oct 30-31, 2014**  
**NSF Headquarters, Stafford I, Room 1235**

**SBE Advisory Committee (AC) Members Present:** Dr. Emilio Moran (Chair), Center for Global Change and Earth Observations and Department of Geography, Michigan State University; Dr. John Cacioppo, Center for Cognitive and Social Neuroscience, University of Chicago; Dr. J.W. Harrington, Vice Chancellor for Academic Affairs, University of Washington, Takoma; Dr. Jon A. Krosnick, Department of Communications, Stanford University; Dr. Joanna Morris, School of Cognitive Science, Hampshire College; Dr. Steven Ruggles, Minnesota Population Center, University of Minnesota; Dr. Elizabeth Higginbotham, Department of Sociology, University of Delaware; Dr. Karen Cook, Department of Sociology, Stanford University; Dr. Martha Farah, Director, Center for Neuroscience and Society and Department of Psychology, University of Pennsylvania; Dr. William Riley, Office of Behavioral and Social Sciences Research, National Institutes of Health (*Ex officio*); Dr. Kenneth Bollen, Department of Sociology, University of North Carolina, Chapel Hill (via phone); and Dr. Alicia Knoedler, Center for Research Program Development and Enrichment, University of Oklahoma (via phone, representing the Committee on Equal Opportunities in Science and Engineering, CEOSE).

**SBE Advisory Committee Absent:** Dr. Christopher H. Achen, Politics Department, Princeton University; Dr. Ruth DeFries, Department of Ecology, Evolution and Environmental Biology, Columbia University; and Dr. Ira Harkavy, CEOSE Liaison, Barbara and Edward Netter Center for Community Partnerships, University of Pennsylvania.

**NSF Advanced Cyberinfrastructure Advisory Committee (ACCI) Members Present:** Dr. Victoria Stodden (ACCI Co-chair), Graduate School of Library and Information Science, University of Illinois at Urbana-Champaign; Dr. Thom Dunning (ACCI Co-chair), Northwest Institute for Advanced Computing, Pacific Northwest National Laboratory-University of Washington; Dr. Kerstin Lehnert, Lamont-Doherty Earth Observatory, Columbia University; Dr. David Yaron, Department of Chemistry, Carnegie Mellon University; Dr. Bruce Donald, Department of Computer Science, Duke University; Dr. Collin Stultz, Department of Health Sciences and Technology, Massachusetts Institute of Technology; Dr. Michael Hildreth, Department of Physics, University of Notre Dame; Dr. Fred Choobineh, College of Electrical Engineering, University of Nebraska-Lincoln; Dr. Lee Allison, Arizona Geological Survey; and Dr. Henry Neeman, Supercomputing Center for Education and Research, University of Oklahoma.

**NSF Staff in Attendance:** Dr. France Córdova, Director; Dr. Fay Lomax Cook, Assistant Director (AD), SBE; Dr. Joanne Tornow, Deputy AD, SBE; Mr. John Gawalt, Division Director, SBE/National Center for Science and Engineering Statistics (SBE/NCSES); Ms. Jeri Mulrow, Deputy Division Director, SBE/NCSES; Dr. Jeryl Mumpower, Director, SBE/Division of Social and Economic Sciences (SBE/SES); Dr. Alan Tomkins, Deputy Division Director, SBE/SES; Dr. Mark Weiss, Director, SBE/Division of Behavioral and Cognitive Sciences (SBE/BCS); Dr. Amber Story, Deputy Division Director, SBE/BCS; Dr. Deborah Olster, Senior Advisor, SBE/Office of the Assistant Director (OAD); Dr. Heather Dean, Associate Program Director, SBE/OAD; Dr. Josie Welkom, Program Analyst, SBE/OAD; Mr. Anthony Teolis, SBE Administrative Coordinator, SBE/OAD; Ms. Clarissa Johnson, IT Specialist, SBE/OAD; Mr. Philip Johnson, IT Specialist, SBE/OAD; Dr. Heng Xu, Program Director, SBE/SES; Dr. Suzanne Iacono, Acting Assistant Director, Directorate for Computer and Information Science and Engineering (CISE); Ms. Irene Qualters, Director, Division of Advanced Cyberinfrastructure (ACI), CISE; and other NSF staff.

**Note:** The meeting was open to the public and representatives of stakeholder groups also attended.

**Summary:** This was the second meeting of the SBE AC in 2014. The agenda covered the following: update on the directorate's activities; a joint meeting with the NSF Advisory Committee for Cyberinfrastructure (ACCI); a report from the SBE AC Subcommittee on Replicability in Science; acceptance of the report from the SBE AC Subcommittee on Advancing SBE Survey Research; a meeting with the NSF leadership; and a briefing on the National Center for Science and Engineering Statistics. The agenda also included a session on Understanding the Brain: current NSF activities, a panel of research presentations by NSF-funded scientists, and discussion of future directions for SBE sciences in this area.

#### **Directorate Update (Dr. Fay Lomax Cook)**

The directorate update began with the announcement of several transitions among the SBE Senior Leadership. Dr. Fay Lomax Cook became the SBE AD in September, 2014. In December, 2014, Dr. Joanne Tornow will leave SBE to become head of the NSF Office of Information and Resource Management. Dr. Clifford Gabriel will serve as Acting Deputy Assistant Director of SBE until a successor to Dr. Tornow is selected. Dr. Lomax Cook also introduced new program officers in SBE and then reviewed the Fiscal Year (FY) 2015 budget. NSF is operating under a Continuing Resolution that is in effect until December 11, 2014. The SBE emphasis areas in the FY 2015 Budget Request include Understanding the Brain, Critical Resilient Interdependent Infrastructure Processes and Systems, Cyberinfrastructure for 21<sup>st</sup> Century Science, Engineering and Education, Secure and Trustworthy Cyberspace, and the Science of Learning.

SBE has also issued several new calls for research proposals: Dear Colleague Letters for Industry/University Cooperative Research Centers in Forensic Sciences and in Understanding the Brain's Structure and Function, and a solicitation for Integrative Strategies for Understanding Neural and Cognitive Systems. SBE is developing new solicitations for the Science of Learning and a successor to *Building Community and Capacity for Data-Intensive Research in the SBE Sciences and in Education and Human Resources*. Dr. Lomax Cook also highlighted several SBE-funded, recent award winners, including Drs. Jean Tirole (Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel), Marcus Raichle (Kavli Prize in Neuroscience), and Robert Axelrod (National Medal of Science).

#### **Joint Meeting of SBE AC and NSF Advisory Committee for Cyberinfrastructure (ACCI)**

Drs. Fay Lomax Cook and Suzanne Iacono delivered welcoming remarks and explained the purpose and history of the joint meetings of the ACCI and NSF directorate ACs. These joint meetings are designed to improve the Foundation's understanding of the cyberinfrastructure needs of different scientific disciplines and inform NSF cyberinfrastructure activities. Following brief introductions of the ACCI and SBE AC members, Dr. Jeryl Mumpower gave an overview entitled "Shared Cyberinfrastructure and SBE Research: Finding the Linkages." Ms. Irene Qualters provided an overview of ACI collaborations with all directorates, including SBE, and outlined thematic areas of engagement between ACI and SBE.

This joint meeting focused on two topics of interest to both ACs: 1) reproducibility and data sharing, and 2) privacy and confidentiality. Drs. Joanne Tornow and Victoria Stodden introduced the topic of reproducibility and data sharing, outlining why it is of interest to the SBE and cyberinfrastructure research communities and current activities addressing it. The topic of privacy and confidentiality was introduced by Drs. Heng Xu and Thom Dunning. They, too, presented the perspectives of the SBE and cyberinfrastructure research communities. They emphasized that while much attention has focused on data security, there is a growing need for attention to privacy and confidentiality as more data are

shared and different types of data are integrated (raising the chances of re-identification of individual subjects).

Breakout groups comprised of members of both ACs were formed to discuss the two topics. The breakout group discussing reproducibility and data sharing acknowledged the increasing complexity of data, which may increase the chance for errors and contribute to irreproducibility. This group articulated the need for 1) the sharing of both data and analysis code; 2) carefully designed standards and cyberinfrastructure that address the unique needs of the relevant scientific community; 3) improved incentives for data sharing; and 4) stronger enforcement of current data sharing and management plan requirements. The breakout group addressing privacy and confidentiality discussed the rapidly changing nature of data that are being made available. This group identified a need for a common, standard set of protocols for data use and storage that protects privacy and confidentiality. They also noted that future research can build on the rich history of studies of privacy and confidentiality in the social, behavioral and economic sciences, and warned against over-restricting access to data in the name of privacy and confidentiality.

Summaries of each breakout group discussion were presented when the two ACs reconvened. An additional issue raised during the full group discussion was the concern that some schools are moving away from teaching methodology and statistics and toward individual mentoring, which results in variable quality and quantity of training in these areas. The participants also suggested a number of NSF actions to promote data sharing, reproducibility, and the protection of privacy and confidentiality: develop standards for graduate education; fund research on how to best de-identify different types of data; and require a data dissemination and archiving plan in grant proposals. Participants also expressed interest in a workshop for investigators with expertise in the social, behavioral and economic sciences and in cyberinfrastructure to work on more targeted opportunities for collaboration. One suggested focus for such a workshop was the development of a prototype for data and code sharing and reproducibility in a specific content area in the social, behavioral and economic sciences.

**Report from the SBE AC Subcommittee on Replicability in Science (Dr. John Cacioppo)**

Dr. Cacioppo reviewed the February, 2014 workshop, *Robust Research in the Social, Behavioral, and Economic Sciences*, organized by the Subcommittee on Replicability in Science. The workshop brought together researchers, journal editors, university administrators, and federal funding agency representatives to discuss the issue and make recommendations to address scientific replicability. He also presented the Subcommittee's draft report. Based on the workshop and subsequent discussions within the Subcommittee, the report includes 12 recommendations for SBE and NSF actions to improve scientific replicability. The AC discussion following the presentation touched on several topics, including the difference between replicability and generalizability, effect sizes, and the need to make non-statistically significant results available. The AC was asked to review the draft report and send comments back to Dr. Cacioppo by December 15<sup>th</sup> so the report can be finalized in time for the next SBE AC meeting.

**Report from the SBE AC Subcommittee on Advancing SBE Survey Research (Dr. Jon Krosnick)**

A final report from the Subcommittee has been issued in which recommendations were made on best practices in survey research and topics for future research on survey methods, as discussed in previous AC meetings. The AC voted to accept the report as written.

**Directions for SBE Science in the 21<sup>st</sup> Century: 2020 Themes/*Rebuilding the Mosaic* (Dr. Fay Lomax Cook)**

Dr. Lomax Cook reviewed the main themes from the SBE 2020 report, *Rebuilding the Mosaic: Fostering Research in the Social, Behavioral and Economic Sciences at the National Science Foundation in the Next Decade*, which was published in 2011. The report articulates a vision for future research in the SBE sciences that would be interdisciplinary, data intensive and collaborative. In addition, it identifies four cross-cutting research topic areas: 1) Population change: family, migration, aging; 2) Disparities: health, gender, race and ethnicity, education, and more; 3) Brain, behavior, communication, language, learning, and linguistics; and 4) Technology, new media, and social networks. NSF has addressed the report through specific programs and opportunities such as Interdisciplinary Behavioral and Social Sciences Research (IBSS); Building Community and Capacity for Data-Intensive Research in the Social, Behavioral, and Economic Sciences and in Education and Human Resources; and SBE Postdoctoral Research Fellowships.

Participants in the discussion pointed out that some themes are missing from the *Mosaic* report, including the changing workplace and labor markets, the lack of jobs for people being displaced, global economics, the sharing economy, infrastructure investment, crime, and positive psychology. There was also interest in adding human-environment interactions, and diversity/broadening participation with an expansion of our view of diversity to include diversity in sexuality. Also discussed was the need for an analysis of the SBE portfolio, particularly with regard to the four cross-cutting research themes identified in the *Mosaic* report and a report on outcomes from the IBSS program.

**Discussion with NSF Leadership (Dr. France Córdova)**

Dr. Córdova talked about efforts to improve NSF outreach and communication, and new guidelines for transparency and accountability for drafting NSF award titles and abstracts. The new guidelines address not only the content of award abstracts and titles, but also NSF staff responsibilities for ensuring that titles and abstracts of funded research make clear the scientific purpose and relevance to the NSF mission. She and the AC also discussed disparities and broadening participation, as well as STEM education and public acceptance of scientific knowledge, scientific reproducibility, Understanding the Brain, social genomics/epigenetics, and global warming (human-environment interaction).

**National Center for Science and Engineering Statistics (Mr. John Gawalt)**

John Gawalt gave an overview of the history of NCSSES and updates on recent NCSSES activities. Among the many highlights were collaborations to improve standardization, quality, and international comparability of data on education, workforce, and mobility and the development of new surveys on Microbusiness Research and Development (R&D) and Innovation, Nonprofit R&D Performance and Funding, and Early Career Doctorates. NCSSES is also expanding its collection of data on postdocs and developing longitudinal data sets to facilitate analysis of careers of the science and engineering workforce. NCSSES leverages collaborations with many other agencies and groups, including the Bureau of Economic Analyses and the Census Bureau. Mr. Gawalt also described how the *Science and Engineering Indicators* is becoming a digitally born document, and how new data dissemination methods, including interactive graphics and data exploration tools, are being developed.

Mr. Gawalt also discussed the impact of the Census Bureau's proposed removal of the "Field of Degree" question from the American Community Survey as was just announced in the *Federal Register*. The reason for the proposed elimination of the question is neither cost nor time, but rather, the perception of low benefit that is derived from that question. As was discussed with the AC, this change jeopardizes NCSSES's ability to conduct the National Survey of College Graduates, which depends on the Field of

Degree question for its sampling frame. Removal of the question will undermine NCSES's ability to provide reliable data on labor market outcomes for foreign-earned degree recipients, career pathways using educational and occupational history, gender wage differences, and disability characteristics. The 60 day period for public comment on the Census Bureau's plan is open until December 30, 2014, during which concerned members of the community can comment on the importance of the Field of Degree question and other proposed changes.

**NSF Activities Related to Understanding the Brain (Dr. Amber Story)**

Dr. Story described how NSF is uniquely positioned to advance our understanding of the brain and participate in the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) Initiative, since it funds brain research across many disciplines and has done so for many decades. NSF's goal is to enable scientific understanding of the full complexity of the brain, in action and in context, through targeted, cross-disciplinary investments in research, technology, and workforce development. NSF is accomplishing this by fostering integrative brain research that crosses scales, levels of analysis, and disciplines; expanding our investments in innovative technologies, experimental and analytical methods, and data and cyberinfrastructure that will enable integrative research; and fostering the growth of a globally competitive scientific workforce that will ensure U.S. leadership in brain research and neuro-technologies for decades to come. NSF recently made 36 EAGER (EARly Concept Grants for Exploratory Research) awards totaling \$10.8M that were submitted in response to the Dear Colleague Letter for "Catching Circuits in Action". A new solicitation, *Integrative Strategies for Understanding Neural and Cognitive Systems*, has been released, as have Dear Colleague Letters to encourage international collaboration and new industry-university partnerships in neuroscience. Another Dear Colleague letter announced future NSF interest in an Ideas Lab related to Understanding the Brain. NSF launched the website [nsf.gov/brain](http://nsf.gov/brain), which is a collection of agency activities related to Understanding the Brain. NSF also participates in the Interagency Working Group in Neuroscience (IWGN), which released a report in February, 2014. This group serves as a forum for exchange of information about neuroscience policy, events, and funding. There was interest during the discussion on findings from neuroscience and education, one of the focal points for both IWGN and SBE.

**Neuroscience Panel (Drs. Nina Kraus, Northwestern University; David Poeppel, New York University; and Danielle Bassett, University of Pennsylvania)**

Dr. Nina Kraus discussed research on auditory processing and the effect of early life musical training on auditory processing throughout life. Dr. David Poeppel talked about the neural basis of language, speech, and hearing, as well as his work with a high school class on crowd-sourced neuroscience and auditory processing. The class is developing and conducting student-designed auditory neuroscience experiments. Dr. Danielle Bassett discussed the mapping and control of large-scale neural circuits. She also described research on network dynamics and states of the brain.

The discussion following the investigator panel touched on future directions for SBE research under the Understanding the Brain umbrella activity. Participants pointed out that the study of individual parts of the brain has yielded great findings, as has the newer focus on networks and development of new techniques and mathematical tools. They recommended that these approaches be continued, and brought together to achieve a more comprehensive understanding of brain function, cognition and behavior. One important, open question is whether network dynamics are conserved across scales. It was noted that we can effectively use networks to inform understanding of cognitive functions, but there must be a focus on the right questions and the right metrics in new experiments.

**Agenda and dates for future meetings, assignments and concluding remarks (Drs. Fay Lomax Cook and Emilio Moran)**

SBE is targeting May, 2015 for its next Advisory Committee meeting. Potential agenda items include: the Science and Practice of Broadening Participation, and finalization of the report from the SBE AC Subcommittee on Replicability in Science, the future of the Science of Learning. There was also interest in a follow-up of the *Mosaic* report discussion and themes, analysis of the SBE and Interdisciplinary Behavioral and Social Sciences Research (IBSS) portfolios, an investigator panel focusing on an emerging research area, and interaction with other NSF Advisory Committees.