National Science Foundation
Directorate for Social, Behavioral, and Economic Sciences (SBE) Advisory Committee (AC)
November 2-3, 2017; NSF Headquarters - Rooms W 2210 and W 2220
Meeting Summary

SBE Advisory Committee (AC) Members Present

Dr. Kenneth Bollen, AC Chair, Department of Psychology and Neuroscience and Department of Sociology, University of North Carolina, Chapel Hill; Dr. Joseph Altonji, Economics Department, Yale University; Dr. Ann Bostrom, Daniel J. Evans School of Public Policy & Governance, University of Washington (and Advisory Committee for Environmental Research and Education Liaison); Dr. Karen Cook, Department of Sociology, Stanford University; Dr. Nilanjana Dasgupta, Department of Psychological and Brain Sciences, University of Massachusetts at Amherst; Dr. Catherine Eckel, Department of Economics, Texas A&M University; Dr. Ruth DeFries, Department of Ecology, Evolution and Environmental Biology, Columbia University; Dr. John Gabrieli, McGovern Institute for Brain Research, Massachusetts Institute of Technology; Dr. Arthur Lupia, Department of Political Science, Institute for Social Research, University of Michigan; Dr. Thomas McDade, Department of Anthropology, Northwestern University; Dr. Jennifer Richeson, Department of Psychology, Yale University (by videoconference); Dr. William Riley, Office of Behavioral and Social Sciences Research, National Institutes of Health (*Ex officio*); Dr. Linda Smith, Department of Psychological and Brain Sciences, Indiana University; Dr. Lydia Villa-Komaroff, Massachusetts Life Center (Committee on Equal Opportunities in Science and Engineering, CEOSE, liaison); and Dr. Duncan Watts, Microsoft Corporation.

NSF Staff in Attendance

Dr. France Córdova, Director; Dr. Joan Ferrini-Mundy, Chief Operating Officer; Dr. Fay Lomax Cook, Assistant Director (AD), SBE; Dr. Kellina Craig-Henderson, Deputy AD, SBE; Mr. John Gawalt, Division Director (DD), SBE/National Center for Science and Engineering Statistics (SBE/NCSES); Ms. Emilda Rivers, Deputy Division Director (DDD), SBE/NCSES; Dr. Howard Nusbaum, DD, SBE/Division of Behavioral and Cognitive Sciences (SBE/BCS); Dr. Tamera Schneider, DDD, SBE/BCS; Dr. Daniel Sui, DD, SBE/Division of Social and Economic Sciences (SBE/SES); Dr. Alan Tomkins, DDD, SBE/SES; Dr. Deborah Olster, Senior Advisor, SBE/Office of the Assistant Director (SBE/OAD); Mr. John Garneski, Staff Associate for Budget and Program Analysis, SBE/OAD; Ms. Madeline Beal, Communications Specialist, SBE/OAD; Mr. Anthony Teolis, SBE Administrative Coordinator, SBE/OAD; Ms. Clarissa Johnson, IT Specialist, SBE/OAD; Mr. Philip Johnson, IT Specialist, SBE/OAD; Ms. Dana Hunter, Program Analyst, SBE/OAD; Ms. Anne Marie Kanakkanatt, Program Analyst, SBE/OAD; Dr. Peter Muhlberger, Senior Science Resources Analyst, SBE/NCSES; Dr. Brian Humes, Program Director, Political Science, SBE/SES; Dr. Nancy Lutz, Program Director, Economics, SBE/SES; and Dr. Kay Meyer, Program Director, Sociology, SBE/SES.

Note: The meeting was open to the public and representatives of stakeholder groups also attended. External guest speakers included Dr. Robert Kaplan, Research Director, Clinical Excellence Research Center, Stanford University School of Medicine; Dr. Bruce Meyer, McCormick Foundation Professor, University of Chicago Harris School of Public Policy (via videoconference); Dr. Michael Stern, Fellow for NORC, University of Chicago's Center for Excellence in Survey Research; and Dr. Amy O'Hara, Senior Research Scholar, Stanford Institute for Economic Policy Research and Center for Population Health Sciences, Stanford University (via videoconference).

Summary

This was the second meeting of the SBE AC in 2017. The agenda included the following items: updates on the activities of the SBE Directorate and its divisions; reports from the National Academies of Science, Engineering, and Medicine (NASEM) workshop, *Graduate Training in the Behavioral and Social Sciences* and from the Commission on Evidence-Based Policymaking; integrating "organic" and administrative data with traditional survey data; SBE strategic planning/grand challenges; an update on the activities of the NASEM Roundtable on the Communication and Use of Social and Behavioral Sciences; public attitudes toward and understanding of science; a meeting with NSF leadership; a report on the "Big Three" social science surveys; a briefing on the NASEM report, I*ntegrating Social and Behavioral Sciences within the Weather Enterprise*; and planning for future SBE AC meetings.
Additional information about the meeting is posted at https://www.nsf.gov/sbe/advcomm11_2017/Fall_2017_SBE_AC_Meeting_Agenda.pdf.

Welcome, Introductions, Review of AC Meeting Summary from Spring, 2017, and Preview of Agenda

(Dr. Kenneth Bollen, SBE AC Chair): Following introductions, Dr. Kenneth Bollen welcomed one new AC member, Dr. Duncan Watts, Principal Researcher, Microsoft Corporation. The AC approved the spring, 2017 AC meeting summary, and Dr. Bollen previewed the agenda for the current meeting.

SBE Directorate Update

(Dr. Fay Lomax Cook, AD, SBE): Dr. Cook welcomed the AC and provided a brief update on staff transitions within the Directorate leadership and OAD. She then discussed major activities since the May, 2017 SBE AC meeting: NSF's relocation to Alexandria, VA; visits by SBE leadership to Congress; and two NASEM projects: *Graduate Training in the Social and Behavioral Sciences: A Public Workshop* and *The Value of Social, Behavioral and Economic Sciences to National Priorities*. She then provided a budget update, noting that the President's Fiscal Year (FY) 2018 budget request stipulates an 11 percent reduction in the Foundation's budget (9.6 percent reduction for SBE) as compared to the FY 2017 enacted budget. The FY 2018 bills passed by the relevant House and Senate appropriations committees, in contrast, call for a two percent reduction in the overall NSF budget as compared to FY 2017. At present the FY 2018 appropriations bills have not been passed by the whole House and Senate, and NSF is operating under a continuing resolution through December 8, 2017.

Dr. Cook's presentation continued with the announcement of high-profile awards to SBE-funded researchers; NSF activities in response to Hurricanes Harvey, Irma, and Maria (research funding for projects whose results may enable us to better prepare for, respond to, recover from, or mitigate future catastrophic events); and a communications update, including a preview of a video about SBE-funded research that is currently in production. She then reported progress on the NSF Big Idea, *The Future of Work at the Human-Technology Frontier*, and closed with a brief discussion of SBE partnerships.

National Academies of Science, Engineering, and Medicine (NASEM) workshop, *Graduate Training in the Behavioral and Social Sciences*

(Dr. Robert M. Kaplan, Stanford University, Chair, Workshop Organizing Committee): Dr. Kaplan began his presentation by noting that the that the landscape for SBE scientists is changing. The current model in which researchers train replicants, coupled with the demands and job market pressures, within both academia and the private sector, call for a wholesale rethinking of graduate training. He cited differences between employment in industry and academia, including differing pay and job satisfaction rates, and posited that SBE students are often ill-prepared for industry jobs. As discussed at the NASEM workshop, SBE graduates would be better prepared for careers in industry if they had more experience with interdisciplinary work, team science and externships with industry. They would also benefit from improved exposure to methodological literacy.

Dr. Catherine Eckel led the discussion following the presentation. She questioned whether there really is a problem with graduate education in the SBE sciences, citing the high employment rates among SBE PhD graduates and the prevalence of data science programs that help prepare SBE scientists for careers in industry or for conducting team science. Perhaps some current aspects for graduate student training in the SBE sciences are adequate and they should be refined and improved, rather than discarded. A discussion ensued amongst AC members outlining what they are seeing in their fields and possible solutions to address deficiencies.

Commission on Evidence-Based Policymaking

Dr. Bruce Meyer, University of Chicago): Dr. Meyer began by presenting the background on the Commission on Evidence-Based Policymaking (CEP), which was established by Congressional statute to develop a strategy for increasing the availability and use of federal data to build evidence about government programs, while protecting privacy and confidentiality. The Commission's final report, *The Promise of Evidence-Based Policymaking,* was the result of an eight-month fact-finding process that included public meetings, hearings, and surveys of federal offices that perform program evaluations or gather data. The Commission, comprised of individuals with expertise in privacy, administration, program evaluation, and data, made 22 recommendations in the final report, which was released September 7, 2017.
The report had three major themes:

- Improving access to data with laws and policies that optimize and support the use of data across programs while maximizing privacy;
- Strengthening privacy protections to implement uniform privacy measures across all 130-data gathering federal agencies; and
- Expanding the capacity for evidence building and program evaluation by ensuring sufficient resources to protect and access data.

Dr. Meyer also reviewed HR-4174, a recently introduced House of Representatives bill that would implement many of the recommendations from the Commission's report. Among other provisions, the bill calls for establishing a committee to advise on the policies of a National Secure Data Service to facilitate access to data for evidence-building, while ensuring privacy and transparency in how those data are used; and creating a frame-work for handling federal statistical assets and computer services.

Dr. Joseph Altonji led the discussion after Dr. Meyer's presentation. He provided additional background about the Commission's report, including its recommendation for the creation of a uniform process of qualified researchers to get access to data across agencies (i.e., a researcher who qualifies to access data from one agency would also qualify for access to data from other agencies). He pointed out the need for continued research to improve the tradeoff between privacy/disclosure protection and utility of data. Access to federal data would provide enormous opportunities for researchers and therefore, NSF and SBE have a vital interest in the success of agenda laid out in the report. During the discussion AC members noted that efficient access to data is a force multiplier for research and evaluation. They also reiterated the need for data privacy and security, as they are critical for maintaining support from the Congress and public for data collection and data linking.

Integrating "Organic" and Administrative Data with Traditional Survey Data

(Dr. Michael Stern, NORC at the University of Chicago and Dr. Amy O'Hara, Stanford University): Dr. Stern discussed the linking of administrative data and existing survey data, the advantages this may offer, and some regulatory and ethical considerations that will need to be addressed to make such linkages feasible. He stressed that researchers can no longer depend on any single survey method in the current culture of "self-administration" and "auto-population" of information. Dr. Stern also discussed organic data, which he defined as data generated outside the scope of traditional data gathering tools and surveys. Organic data include those collected through both passive and active methods, apps, social media, etc. His presentation also included discussion of concerns about privacy and security related to the collection and use of organic data.

Dr. O'Hara spoke about the uses of both administrative and organic data, based on her experience at the Census Bureau. There, non-survey data have been used to fill in missing data, add content and context, create and extend panels, and improve traditional surveys. She suggested that the major social science surveys supported by SBE could benefit from additional contextual variables, longitudinal linkages, court data, proprietary data, commercial data, and validation studies. Dr. O'Hara echoed Dr. Stern's concerns about ethical issues with consent, disclosure, and liability as well as practical matters of data linkage and infrastructure construction.

Dr. Duncan Watts opened the discussion by pointing out that much of our knowledge about society and the economy comes from traditional survey data. These traditional methods are feeling increased pressure from cost, time, and reliability that could be eased with the incorporation of the vast quantities of non-traditional data. We're undergoing a profound shift in how we measure social reality in almost real time. The challenge comes in combining the limited data from traditional sources with the open-ended data from non-traditional sources, developing new methods of sampling and calibration, and assessing how to measure the quality of the results when combining data from multiple sources.

SBE Division Updates

National Center for Science and Engineering Statistics (NCSES; Mr. John Gawalt, DD): Mr. Gawalt described NCSES personnel changes, new products that have been released, and the expansion of the Survey of Doctorate Recipients (SDR). The increase in the SDR's sample size allows for significant improvements in the estimates of employment characteristics. Based on feedback from the AC and SBE community, NCSES is currently developing longitudinal estimates for the SDR, which will be

implemented in the 2019 survey. He also described how NCSES has recently partnered with the Census Bureau to develop a single platform for combining multiple business surveys.

Division of Behavioral and Cognitive Sciences (BCS)

Dr. Howard Nusbaum Dr. Nusbaum (BCS Division Director) introduced Dr. Tamara Schneider as the new BCS Deputy Division Director and welcomed other new BCS staff. He then described how BCS has adopted program changes designed to improve proposal quality that have been piloted in other directorates at NSF. The Geography and Spatial Sciences Program no longer has a submission deadline for Doctoral Dissertation Research Improvement proposals; the Cognitive Neuroscience program allows only one submission per year, and other programs have limited the number of Doctoral Dissertation Research Improvement proposals that individual students may submit. He described how SBE continues to play an active role in NSF's *Understanding the Rules of Life: Predicting Phenotype* Big Idea, by supporting research that explores the interaction between behavioral and biological processes. NSF also supported the establishment of the Stanford Center for Reproducible Neuroscience. These activities tie in with the *Harnessing the Data Revolution* Big Idea as they are dependent on large data sets that need to be made widely available. BCS is also partnering with several directorates on multi-perspective projects looking to understand human minds and behavior.

Division of Social and Economic Sciences (SES)

Dr. Daniel Sui (SES Division Director) Dr. Sui introduced new SES staff and went on to describe how the Division's three major social science surveys (the General Social Survey, American National Election Studies, and Panel Study of Income Dynamics) are now managed by an internal executive committee of four program officers that meets weekly. These changes were made in response to suggestions from the NASEM Standing Committee on the Future of NSF-Supported Social Science Surveys. SES is also participating in the *Future of Work at the Human-Technology Frontier* Big Idea and funded several awards in response to the 2017 Hurricanes Harvey, Irma and Maria Dear Colleague Letters.

SBE Strategic Planning/Grand Challenges

This session began with a brief introduction to the topic of SBE Strategic Planning/Grand Challenges by Dr. Fay Lomax Cook. She described how this activity grew out of the NASEM consensus report, *The Value of Social, Behavioral and Economic Sciences to National Priorities.* In response to questions about the value of the SBE sciences, a Committee of experts convened by the NASEM concluded that the SBE sciences advance the NSF mission, the missions of other federal agencies, and the work of business and industry. As tasked to do, the Committee also made several recommendations about strategic planning:

1. NSF should undertake a systematic and transparent strategic planning process that would articulate the most important scientific questions consistent with NSF mission areas, gather input from a wide variety of stakeholders, explain how that input is used, and engage with other agencies.
2. Strategic planning should attend to current trends in science, e.g., collaborative and interdisciplinary research, convergent research, and heavy dependence on large datasets.
3. Strategic planning should support training consistent with the ways science is evolving across all scientific fields, to prepare the next generation of scientists to be more data-intensive, interdisciplinary, and team oriented.

4. Strategic planning should consider how to strengthen communication of SBE research.

Dr. Cook then described the steps being taken to address these recommendations, including seeking input from many stakeholders, including the NSF leadership, National Science Board, SBE research community, NSF/SBE staff, the National Academies, other federal funding agencies, and industry representatives.

To solicit input from the SBE AC the members were divided into three groups. Each group was tasked with 1) identifying grand challenges in the SBE sciences, defined as societal challenges that can be addressed by fundamental research in the SBE sciences, and 2) articulating specific, scientific questions in the SBE sciences that would address each challenge.

Group One included Drs. Dasgupta (leader), Bollen, Bostrom, Eckel, and McDade. Three grand challenges were presented:

1. How does diversity Influence learning, work, innovation, and creativity?
2. Equal opportunity
3. Understanding gene-environment interplay throughout the life course

Group Two included Drs. Gabrieli (leader), Altonji, DeFries, Richeson, and Watts. Two grand challenges were presented:

1. Redesigning the information ecosystem to better serve democracy
2. How can the SBE sciences contribute to ensuring every child achieves basic reading and math skills by the end of 3rd grade?
3. Solutions for dynamics that define the trajectory of the U.S. and affect the health, prosperity, and welfare of its citizens

Group Three included Drs. Karen Cook (group leader), Lupia, Riley, Smith, and Villa-Komaroff. Three grand challenges were presented:

1. Developmental inequalities
2. Learning: Brains, machines and people
3. Communicating beneficial public-private sector improvements in an age of increasing uncertainty.

After the presentations by each group, general discussion followed. In response to questions about next steps for this activity, Dr. Fay Lomax Cook explained that soliciting input on grand challenges from the AC is one step in a series of actions that will be complemented by outreach to other stakeholders, such as SBE disciplinary associations. In addition, she asked AC members to review and refine the grand challenges presented at this meeting. After all the input is received, there would be a down selection to approximately five grand challenges that could inform future NSF/SBE priorities for investment.

Before concluding the discussion, the AC members were provided with several additional grand challenges identified by SBE staff during a previous, internal SBE retreat:

- Stimulating Creativity, Innovation, and Productivity in America (SES)
- The Need for Improving Cooperation and Communication (BCS)
- Public Trust in Institutions (NCSES)
- Increasing Access to Opportunities in America (OAD)

National Academies of Science, Engineering, and Medicine Roundtable on the Communication and Use of Social and Behavioral Sciences

(Dr. Arthur Lupia, University of Michigan): Dr. Lupia presented an overview of the NASEM Roundtable's mission and activities to date. The goal of "Version 1.0" of the Roundtable is to support the communication and use of reliable and relevant science for addressing important societal issues. The Roundtable's strategy has been strategic engagement of knowledge producers and stakeholders to discuss how to better serve the public with science and improve the reliability of information. To this end a series of events were held.

The first event included stakeholders from multiple spheres to discuss their struggles in using SBE sciences to address societal issues. Invitees came from non-governmental organizations, federal agencies, business, and the media. The second event focused on responsible communication and distribution of information. Scholars and media representatives discussed what made something newsworthy, as well as the needs of those who write about SBE. The final event focused on the integration of social and behavioral sciences into K-12 education. Dr. Lupia concluded his presentation by talking about "Version 2.0" of the Roundtable, which is identifying how to make communicating the impact of the SBE sciences more relevant, meaningful, and timely.

A discussion ensued amongst the AC members including topics such as: the negative effects of click bait in contemporary media on the representation of science; the ability to leverage the increasing number of professional societies offering communications training at their annual meetings; and approaches to encouraging further growth of training opportunities in the science communications field. A final discussion point centered on putting SBE scientists in touch with state and local governments to make relevant research findings more accessible to them.

Public Attitudes toward and Understanding of Science

(Dr. Peter Muhlberger, Senior Science Resources Analyst, NCSES): Dr. Muhlberger discussed activities related to the public understanding of science, specifically those published in chapter seven of *Science and Engineering Indicators (SEI) 2016*. He began by presenting data relating to which media sources the public use to find scientific information. Since 2001, there have been steady declines in the use of print and TV, while the internet has become the primary source of science information for most Americans.

He continued by presenting data indicating that Americans strongly support and are interested in science, and believe the federal government should fund research. Public confidence in the scientific community is second only to confidence in the military. The data also indicate that knowledge of and interest and confidence in science correspond strongly to level of education and are correlated with taking science and math classes in high school and college. However, the data also indicate that approximately half of Americans believe that technological and industrial change is too rapid and that science contributes to that.

Dr. Lupia was the discussant following the presentation and began by emphasizing that these data not only tell us how the public perceives science and scientists, but also inform how scientists can approach the public. The fear that science is contributing to a too rapid rate of change is an important data point and should not be overlooked. Scientists should remember that theory and practice are two separate

things. For example, scientific theory may discuss the movement of people to where jobs are most abundant but this is, from a practical stand-point, not feasible or realistic for many individuals. He urged scientists to think about how they can use the data on the public understanding of and attitudes toward science to help the public increase their scientific literacy and address their concerns regarding the rate of technological change. Other AC members suggested that the survey that collects data on these data could and should be improved through engagement with the SBE scientific community.

Meeting with NSF Leadership

(Dr. France Córdova, Director, NSF; Dr. Joan Ferrini-Mundy, Acting Chief Operating Officer, NSF): Dr. Córdova began the session with opening remarks affirming the importance of government investment in fundamental research, as evidenced by the confirmation of the existence of gravitational waves by the NSF-funded Laser Interferometer Gravitational-Wave Observatory (LIGO). She then described progress on NSF's "Ten Big Ideas for Future Investment" such as *NSF INCLUDES* (Inclusion across the Nation of Communities of Learners of Underrepresented Discoverers in Engineering and Science), which made 27 new Design and Development Launch Pilot awards in FY 2017. The Foundation also made 23 new awards to foster Convergence in the context of five of the "Big Ideas": *Harnessing the Data Revolution*; *Navigating the New Arctic*; *The Quantum Leap: Leading the Next Quantum Revolution*; *The Future of Work at the Human-Technology Frontier*; and *Understanding the Rules of Life: Predicting Phenotype*. These awards support workshops, summer institutes and Research Coordination Networks.

Dr. Córdova then addressed the general question of what Advisory Committees can do to advance the NSF mission and ensure the Foundation's success. She emphasized the importance of communicating the value of basic research in addressing societal challenges and satisfying our quest for knowledge. She recommended that these communications efforts use examples of NSF investments that have produced knowledge that has improved lives, and that they remind audiences of the importance of continued NSF funding to produce the next round of impactful discoveries. At the same time, Dr. Córdova emphasized, we must convey that NSF will continue to be responsible stewards of the scientific enterprise, supporting the responsible conduct of research and scientific integrity.

The discussion in the remainder of the session touched on several topics: the FY 2018 NSF budget; relationships between NSF and Congress; strengthening the connection between NSF awards and scientific breakthroughs and impact; the report from the Commission on Evidence-based Policymaking and the legislation that has been introduced to implement several of its recommendations; graduate training in the SBE sciences; and grand challenges in the SBE sciences.

Report on the "Big Three" Social Science Surveys

(Dr. Brian Humes, Program Director, Political Science; Dr. Nancy Lutz, Program Director, Economics; Dr. Kay Meyer, Program Director, Sociology): SES Programs Directors provided an update on the three major social science surveys supported by SBE: the American National Election Studies (ANES), the Panel Study of Income Dynamics (PSID), and the General Social Survey (GSS). They provided a summary of each survey and described SBE's response to the suggestions made by the NASEM Standing Committee on the Future of NSF-Supported Social Science Surveys:

1) SES held a "Big Three" workshop attended by each survey's leadership to discuss best practices, data archiving and dissemination, and funding challenges.
2) SES created a Big Three executive committee to better coordinate survey management within SBE.
3) SES and the institutions managing the surveys are investigating potential synergies among the surveys such as data dissemination and the timing of data collection.

Dr. Riley led the discussion following presentations. He began by summarizing the content of national importance in each survey and overlap among them, and the nuances and intricacies of each survey regarding methods, testing, and geographic coverage. He noted that 2020 is a critical year since PSID will be re-competed, ANES will survey the next presidential election, and the next decennial Census will take place. The ensuing AC discussions centered around data sharing and common dissemination platforms, whether these surveys are considered mid-scale infrastructure by NSF, the tension between longitudinal data collection and adding new items, and the possibility of combining aspects of the various surveys.

Integrating SBE within Weather Enterprise

(Dr. Ann Bostrom, University of Washington)**:** Dr. Bostrom presented the findings of the NASEM consensus report, *Integrating Social and Behavioral Sciences within the Weather Enterprise*. The NASEM Committee was tasked with assessing the current value of social and behavioral science activities to the weather enterprise; describing the value of improved integration of these sciences into the rest of the weather research enterprise and barriers to doing so; developing a research agenda; and identifying infrastructural and institutional arrangements necessary to pursue the research and transfer the findings to the operational setting.

The report indicates that integrating social and behavioral sciences into the research and operations of the weather enterprise will take a paradigm shift. This is an opportune time to realize this shift, as NSF- and NOAA-funded research has laid a foundation for doing so. There is also strong support on Capitol Hill with the Weather Research and Forecasting, Act of 2017 and in the public sector.

The integration of SBE sciences into the weather enterprise is an example of convergent research and faces the same barriers inherent in other types of convergent research: use of different language in different disciplines, limited understanding and misconceptions of SBE sciences, and constrained or inconsistent funding. The NASEM Committee recommended three general areas of research to pursue: 1) weather enterprise system-focused research; 2) risk assessments and responses, and factors influencing these processes -- including research on how to better reach and inform special-interest populations; and 3) message design, delivery, interpretation, and use. The Committee also recommended building capacity to support and implement SBE sciences research related to the weather enterprise, which would require more sustained funding, and underscoring the importance of this research to leadership across government and the weather enterprise.

During the discussion following Dr. Bostrom's presentation AC members discussed the readiness of relevant SBE research for practical application, especially the large body of evidence on the communication of uncertainty that is ready to move further into application.

Future meetings, Assignments, and Concluding Remarks

Dr. Fay Lomax Cook announced that AC member Dr. Thomas McDade was completing his term on the AC and presented him with a certificate of appreciation.

Dr. Cook asked the AC members to refine their proposed grand challenges in the SBE sciences. Once the revised challenges are received, SBE will engage the AC in a prioritization process. At the same time, SBE will continue seeking input from the broader SBE research communities and other NSF Advisory Committees. There was also discussion of developing a "brand" for SBE that would unify or frame the grand challenges, with several AC members volunteering to work on that. Lastly, the AC agreed to form a Subcommittee to explore SBE-industry partnerships. SBE will follow up with a request for volunteers to populate the subcommittee and will develop an appropriate charge to guide its work.

The meeting was adjourned at 12:22 p.m.

This summary was approved by the SBE Advisory Committee at its meeting on May 10, 2018.