



United States Federal Agency Response to the National Academies Workshop on Graduate Training in the Social and Behavioral Sciences

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Authors' contributions

This work was carried out in collaboration among all authors. Author WTR led the writing on this manuscript. All authors contributed substantially to the writing of this manuscript. All authors read and approved the final manuscript and all members of the Social and Behavioral Sciences Subcommittee had the opportunity to review and contribute to this manuscript.

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Commentary

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ABSTRACT

With support from federal agency members of the United States National Science and Technology Council's Social and Behavioral Science subcommittee (SBS), the National Academies of Sciences, Engineering and Medicine (NASEM) held a workshop in June, 2017 (NASEM, 2017) on Graduate Training in the Social and Behavioral Sciences to identify how SBS graduate education could be adapted to changing workforce needs. Key points from this workshop included greater training in interdisciplinary team science, communicating science, and quantitative skills as well as increasing diversity of SBS trainees and graduates. In response to this workshop, the SBS subcommittee describes the relevance of the key points from the workshop on the social and behavioral science workforce needs in the United States (US) federal government and the efforts of the various federal agencies to augment graduate training to address important research, practice, policy and administrative needs of the government.

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1. BACKGROUND

Research from the social and behavioral sciences is transforming how people live. Today, the social and behavioral sciences bring an expanding set of sophisticated methodologies and datasets together with an increasingly diverse scientific workforce to examine problems essential to human societies. From neurons to nations, research advances are helping us understand ourselves, one another and our interactions with the constructed and natural environments in which we live.

As the social and behavioral science enterprise has grown in its complexity and impact, the world we study has undergone many changes. Evolving technologies, cultures and their associated effects on economies and governments have led to changes in the kinds of opportunities available for individuals who pursue advanced training in the social and behavioral sciences. Decades ago, it was common for graduate students in many academic fields to expect subsequent employment in tenure-track jobs at research universities. Today, expectations are different. Growth in the number of PhDs awarded, combined with a slowing growth of tenure-track positions, has contributed to these changes. At the same time, rising numbers of social and behavioral scientists have skillsets that are of interest to government, industry and nonprofits around the world.

In response to this changing landscape, the US National Science and Technology Council's Social and Behavioral Science subcommittee (SBS) sought to promote a broad conversation about whether and how graduate training in the social and behavioral sciences should change. SBS consists of representatives with backgrounds or interests in the social and behavioral sciences working in a wide variety of US Federal government agencies.¹ Members of the subcommittee observed that critical aspects of the focus and content of graduate training in the social and behavioral sciences have remained largely unchanged over several decades. They wanted to learn more about

whether and how changes could benefit social and behavioral research and its impact on society – changes that reflect the growing diversity of workplaces in which social and behavioral scientists are employed and the skills required in these newer positions. The subcommittee was particularly concerned about the correspondence between graduate training and the demands of private and public sector positions for which social and behavioral scientists are increasingly sought.

To address these concerns, the SBS, through its representatives from the National Science Foundation (NSF) and National Institutes of Health (NIH), funded a workshop to identify how SBS graduate education could be adapted to these changing workforce needs. The National Academies of Sciences, Engineering, and Medicine (NASEM) held this workshop in June, 2017 [1].

The two-day workshop included a review of the data from the Survey of Doctorate Recipients [2] and panels discussing experiences working outside academia, the increasing demand for data analytic skills and visions for the future of SBS graduate education. Among the takeaways from the workshop were the need for: 1) additional training and experience in interdisciplinary and team science, 2) training and experiences in communicating science, not only with the public but also across disciplines, 3) greater diversity among SBS trainees and graduates, 4) increased training in data analytics and quantitative skills and 5) legitimizing and better preparing students for careers other than in academia.

2. FEDERAL PERSPECTIVE

Among the alternative career pathways for which SBS graduates can be better prepared are positions in government. There are a wide array of SBS positions within the federal government, and the diverse skill sets necessary to perform in these positions is consistent with the findings from the report. Some positions predominantly involve largely research tasks and require similar skills as traditional academic research positions. These research positions range from more lab-based or clinical research at agencies such as NIH intramural, Department of Defense, and Veterans Administration to the various survey efforts of the federal government, including at the

¹ *The authors were members of the SBS subcommittee at the time that the workshop that was proposed or are members of the committee's current form. SBS ceased to be part of the NSTC in 2018 but member organizations continue to send social and behavioral science representatives to meet on a regular basis.*

Centers for Disease Control, Department of Labor and Commerce Department.

SBS positions in the federal government, however, extend far beyond traditional research duties and responsibilities. Numerous positions, such as at the the Environmental Protection Agency, National Oceanic and Atmospheric Agency, and the United States Geological Survey involve the application of social and behavioral sciences research to practice and policy. With the heightened interest in administrative government data sets, particularly in light of the Evidence-Based Policymaking Act of 2017 [3], social and behavioral scientists will be called upon increasingly not only to apply SBS research generated elsewhere, but to analyze their own administrative data sets to evaluate policies and regulations.

Social and behavioral scientists also are employed in a range of administrative and leadership areas, particularly in the administration and oversight of research supported by various agencies such as the NIH, NSF, Department of Education, and National Institute of Justice. A surge in demand for program evaluation and performance measurement strategies across federal government have brought the unique skills of social scientists and behavioral researchers to greater prominence within several agencies and departments.

These SBS positions within the government reflect many of the graduate training needs identified in the NASEM workshop report. First, the increasing emphasis on the use of large data sets, and administrative data sets in particular, highlights the value of strong data management and analytic skills within the government. Second, for some agencies, social and behavioral scientists are a small but critical component of diverse transdisciplinary teams. For example, at NOAA, social and behavioral scientists address issues of disaster preparedness and improving the effectiveness of warnings and evacuation notices. To be effective, these social and behavioral scientists must know how to work with teams from disciplines substantially different from their own and with different terminologies and scientific cultures. They must be able to communicate their science clearly and effectively to colleagues from other disciplines, policymakers, and the general public. Third, government functions best with a diverse workforce that reflects the makeup

of the nation; therefore, a focus on diversity in graduate SBS programs provides an important pipeline to ensure diversity in the government workforce.

There are additional skills needed in government positions that were addressed more indirectly in the NASEM report. The workshop panel on private sector positions noted the workplace culture differences between academia and the private sector and the adjustments needed to adapt to the pace and organizational systems in the private sector. There is also an adjustment from academia to government workplace cultures. Perhaps most salient is the difference between the freedom of academia versus the constraints and lines of authority in government. A critical skill in government positions is knowing by what authority one is able to take action. Government employees must be well-versed in the policies, regulations, procedures and processes that are applicable to their duties, and have the judgment to determine when any given action requires prior approval or notification.

In addition to understanding the workplace culture of government agencies and how it differs from the academic setting where SBS graduates have trained, it is also useful to have interests in policy, both science policy and public policy, and in the application of social and behavioral science principles to policy development and implementation. Within the General Services Administration, the Office of Evaluation Sciences, for example, applies social and behavioral science to the procedures and processes involved in implementing government policies, and rigorously evaluates various strategies to improve these procedures and processes [4]. Related to these policy skills, interest and ability to serve as a supervisor or administrator are useful for career advancement. Managing people is inherently a social and behavioral task, and social and behavioral scientists in the government are often called up to serve in these managerial and supervisory roles as a result of this background and skill set.

To provide experiences for SBS graduates in government positions, various agencies of the federal government offer predoctoral and postdoctoral training experiences. Many agencies accept AAAS Science and Technology Fellows [5]. This program provides opportunities for postdoctoral scientists and engineers to learn about federal policymaking and apply their knowledge to address societal issues. This is an excellent

two-year, paid training opportunity that SBS graduates should seriously consider if they are interested in policy and government positions. In addition to the AAAS program, there are a number of training experiences and opportunities offered by the various agencies of the federal government. Table 1 lists some of the training opportunities that the SBS subcommittee compiled from their various agencies.

Federal agencies also support some of the key data analytic and methodology needs of SBS graduate training through various training programs and awards. For example, the NIH Office of Behavioral and Social Sciences Research supports training institutes to provide SBS graduates with some of the advanced methodology and analytic skills highlighted in the NASEM workshop report that their graduate programs may not have provided [6]. The Institute for Education Sciences in the Department of Education [7] funds training workshops intended for junior faculty and advanced graduate students in various quantitative and mixed methods approaches.

The National Cancer Institute has supported team science efforts and the application of the science of teams to transdisciplinary science [8]. The National Science Foundation’s Social, Behavioral and Economic Science Directorate (SBE) funds similar inquiries through its Science of Science and Innovation Policy (SciSIP) programs [9]. SBE is also a focal participant in

NSF’s Big Ideas initiative [10], a set of programs that provide opportunities for social and behavioral scientists to work with other scientists as well as partners in government and industry to address some of science and society’s greatest challenges.

To promote diversity of the scientific workforce, federal agencies offer a range of diversity training opportunities. Among its efforts to support workforce diversity, the NIH provides diversity supplements to students, postdoctorates, and eligible investigators from groups that have been shown to be underrepresented in health-related research [11]. NSF’s INCLUDES program [12] funds individual investigators and research organizations to develop, implement and evaluate various means for broadening opportunity pipelines and reinforcing mentoring and associated development practices.

Federal agencies play a significant role in training the SBS workforce, both for the general advancement of the field and for ensuring that well-trained graduates have the skills needed to succeed in government positions. The points from the NASEM workshop on graduate training in the social and behavioral sciences are consistent with the skills needs of federal SBS positions, and several federal agencies support a number of initiatives to advance many of the training points in this workshop report.

Table 1. Example federal government training experiences by agency

Agency	Training opportunities	Where to apply
NIH	Intramural Research Training Awards (IRTAs)	https://www.training.nih.gov/programs/postdoc_irp
DOEd, CDC, DHS, DOD, EPA, FDA, NIH, NSF, USDA, others	Oak Ridge Institute for Science and Technology	https://orise.orau.gov/
NOAA, others	Sea Grant Knauss Fellowships	https://seagrant.noaa.gov/Knauss
EPA	Student Internships	https://www.epa.gov/careers/student-internships
EPA	People, Prosperity and the Planet (P3) Student Design Competition	https://www.epa.gov/P3
DOEd	Research Training in Educational Sciences	https://ies.ed.gov/ncer/research/researchTraining.asp
DOEd	Research Training in Special Education	https://ies.ed.gov/ncser/research/trainingPrograms.asp
NEA	Graduate Research Interns	https://www.arts.gov/about/jobs/internships

These federal training initiatives supplement but cannot replace core university-based graduate training in the social and behavioral sciences. Graduate programs must continue to evaluate their current curricula and modify their programs to train students in the skills needed in an ever-evolving social and behavioral sciences workplace. Calls for modifying and transforming training in the social and behavioral sciences are not new [13,14], yet, as noted by the NASEM workshop report, graduate programs have remained largely unchanged. Graduate programs in the social and behavioral sciences and the various federal agencies that support training programs and hire these graduates need to combine forces and partner to align better graduate training programs with the skill sets needed for these graduates to succeed and advance these sciences.

3. CONCLUSION

There are many topics for which social and behavioral science expertise is more important than ever. Social and behavioral scientists are called upon increasingly to apply their skills in an expansive set of venues that includes universities but expands far beyond them. With continued communication and a willingness to learn from one another, federal agencies have tremendous opportunities to make the social and behavioral sciences' next era one of great innovation and of great value to people everywhere.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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