The Role of Social Science Research in National Security

## HIGHLIGHTS FROM THREE NATIONAL ACADEMIES REPORTS

The National Academies of Sciences, Engineering, and Medicine (The National Academies) report on *The Value of Social, Behavioral, and Economic Sciences to National Priorities* argues that nearly every major challenge for the United States requires understanding the causes and consequences of people's behavior. Even challenges that at first glance appear to be issues only of medicine or engineering or computer science have social and behavioral components. Having a fundamental understanding of how people and societies behave, why they respond the way they do, what they find important, what they believe or value, and what and how they think about others is critical for the country's well-being in today's global environment.

Like all sciences, the social, behavioral, and economic sciences bring a rigorous, methodical approach to pursuing knowledge—collecting data, formulating and testing hypotheses, analyzing evidence—that sheds light on the underlying nature of problems and can help point the way toward remedies. Those remedies depend in part on understanding the social, behavioral, and economic components of problems and how they interact with other aspects.

The social, behavioral, and economic sciences have produced useful fundamental knowledge, along with a variety of theories, methods, datasets, and tools that can predict and explain behavior, identify problems, track them over time, and inform decision making. The numerous contributions of social, behavioral, and economic research to society can easily be overlooked, in some cases precisely because the knowledge from this research has become widely accepted, or because those who could benefit from the research are often not aware of the sophisticated tools and insights that are available. However, federal, state, and local governments are increasingly recognizing the utility of the social, behavioral, and economic sciences to both the formulation of policy and the testing of which policies do or do not work in practice.

The importance of social science research to U.S. national security is discussed in several recent National Academies reports. This brief highlights key findings from three reports that describe work funded across different U.S. government agencies, each bringing value to different aspects of the broader knowledge base and making contributions that often cross-pollinate across the national security community:

- *The Value of Social, Behavioral, and Economic Sciences to National Priorities: A Report for the National Science Foundation* (2017)
- *Evaluation of the Minerva Research Initiative* (2019)
- *A Decadal Survey of the Social and Behavioral Sciences: A Research Agenda for Advancing Intelligence Analysis* (2019)
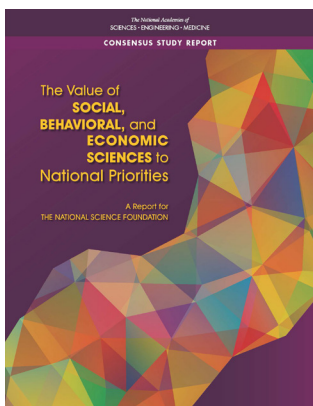
THE VALUE OF SOCIAL, BEHAVIORAL, AND ECONOMIC SCIENCES TO NATIONAL PRIORITIES

This report discusses how social, behavioral, and economic research furthers the mission of the National Science Foundation (NSF), as well as the missions and work of other federal agencies, industry, and business, in a variety of areas, including national defense. The report also makes the case that the federal government should fund this type of research.

NSF funds basic research in a broad range of fields, including the social, behavioral, and economic sciences. The grants do not specifically target research focused on national security topics. However, where applicable, NSF funded research is later used by its federal partners to develop mission specific tools and applications.

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NSF played an early role in supporting research on **terrorism and counterterrorism**, beginning in the late 1980s. Recognizing that terrorists' behavior responds to counterterrorism policies in rational ways, this research used game theory to develop a model to inform counterterror policy. The U.S. Departments of Homeland Security and Defense have sponsored subsequent applications of this research.

NSF has also funded research examining the root **causes of political instability** and indicators of early observable cues that a change in governance or political state is imminent. That research specifically studied cooperation and conflict, ethnic conflict, state stability, governance, and terrorism. This foundational research was applied through support from the Defense Advanced Research Projects Agency and the U.S. Navy to create the Worldwide Integrated Crisis Early Warning System, which provides policy makers, operational commanders, and intelligence analysts with insights and forecasts of changes in political stability.

Social network analysis identifies and allows people to understand the relationships among individuals, organizations, and other entities. It can illuminate key characteristics of relationships, such as the frequency of communication, affiliation, and other social relationships. Social network analysis can be applied to telephone data, school records, organizational structures, or any other relationship-based data. As an example, some NSF-supported research has combined social network analysis with automated text analysis techniques to provide valuable information about the patterns of behavior of hackers and the vulnerabilities of the nation's cyber networks. These tools analyze hacker chats and other data faster and more efficiently than had previously been possible, with the potential to improve predictions about future threats that are based on hackers' intentions. The U.S. Department of Defense and intelligence agencies have developed additional applications of social network analysis for military and intelligence operations.

The report concludes that overall, the social, behavioral, and economic sciences produce a better understanding of the human aspects of the natural world, contributing knowledge, methods, and tools that further the mission of NSF to advance health, prosperity and welfare, national defense, and progress in science.

EVALUATION OF THE MINERVA INITIATIVE

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CONSENSUS STUDY REPORT

Evaluation of the
MINERVA RESEARCH INITIATIVE

The Minerva Research Initiative is a Department of Defense (DoD) social science grant program that funds unclassified basic research relevant to national security. The program's scope is more focused than NSF's, because it funds only research relevant to national security, and prioritizes issues that are particularly important to DoD. At the request of DoD, the National Academies convened a committee of experts to evaluate the program's successes and challenges during its first decade of operation and to offer guidance on the best path going forward.
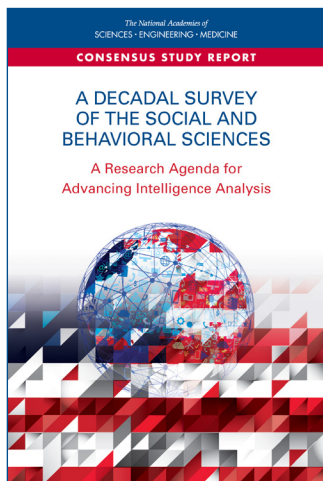
Between 2009 and 2017 the program funded over 100 competitively awarded grants. Minerva research has been published in top journals and tends to have strong citation records. The research has also resulted in books and produced policy-relevant statistical models, databases, and mapping tools, reflecting the value placed by the program on innovative outputs.

Many of the projects have been built on interdisciplinary collaborations that have incorporated perspectives from a variety of social and behavioral sciences, as well as other fields, such as computer science, engineering, and mathematics. Grantees reported that the program has had a positive impact on the amount of dialogue between DoD and the social science community, the number of social science researchers with an interest in research relevant to national security, and the amount of collaboration among researchers working on topics relevant to national security. In recent years, DoD emphasized alignment of Minerva research with the National Defense Strategy (NDS) and greater interaction between Minerva researchers and DoD policy staff to inform the NDS.

The committee's report concludes that the Minerva program has demonstrated its ability to make meaningful contributions to the body of social science research on a range of topics related to national security. The report also highlights ways to build on the Minerva Research Initiative's vision to strengthen the program's foundations and take advantage of opportunities for broadening its reach and usefulness.

A DECADAL SURVEY OF THE SOCIAL AND BEHAVIORAL SCIENCES: A RESEARCH AGENDA FOR ADVANCING INTELLIGENCE ANALYSIS

This report provides an overview of the ways that research in the social and behavioral sciences can strengthen national security. The committee that produced the report conducted a "decadal survey," which is a signature method developed by the National Academies to gather ideas and feedback from the research community in order to develop a plan that shapes future research initiatives. This decadal report was the first that presented guidance on social and behavioral research that will be critical for the Intelligence Community over the next decade.

The primary function of the intelligence analyst is to make sense of information about the world, and the report argues that the way analysts do that work will look profoundly different a decade from now. Technological changes will bring both new advances in conducting analysis and new risks related to technologically based activities and communications around the world. Because these changes are virtually inevitable, the Intelligence Community will need to make sustained collaboration with researchers in the social and behavioral sciences a key priority if it is to adapt to them in the most productive ways.

The report argues that the social and behavioral sciences offer insights into human behavior, capacities, and limitations that the Intelligence Community can integrate into both the content of intelligence analysis (understanding what people and adversaries do) and the technical means of analysis (improving and supplementing the analyst's human capacities).

Some examples of targeted social and behavioral research topics with the potential to benefit the Intelligence Community are described below.

Stronger intelligence assessments

Social and behavioral research provides the essential theoretical and empirical bases for designing and using sophisticated tools and methodologies for analyzing new types of information and understanding complex social and political forces. Developing research on narratives, social networks, complex systems, and affect and

emotion can enhance understanding of the individuals and groups that are the primary targets of intelligence analysis, the potential impact of actions taken by the Intelligence Community, and individual and social processes relevant to security threats.

Tools and technologies designed for human use and human–machine interaction
Technology used for analysis is only as strong as the understanding of the human behavior it is being used to model or explain. Social and behavioral research will be needed for the design of tools that use artificial intelligence and machine learning to support the development of an ecosystem for intelligence analysis composed of human analysts and autonomous artificial intelligence agents, supported by other technologies, with the capacity to derive meaning efficiently from multiple sources of information.

Optimal readiness to confront evolving security threats
Ongoing work is illuminating security-relevant phenomena such as the nature of social networks and complex systems, protections against social cybersecurity threats, evolving ways adversaries influence hearts and minds, and the ways individuals are drawn into radicalization and extremism. The developing field of social cybersecurity can offer tools, tactics, procedures, and policies for assessing, predicting, and mitigating the impact of adversarial social cyberattacks.

SUMMARY AND WAYS OF ACCESSING THE REPORTS

The reports discussed in this brief paint a picture of the national need for investing in basic research in social science and creating paths to integrate findings to inform national security actions and policies. Together, the reports highlight the necessity of different forms of federal funding to support social science research.

The three reports, along with other National Academies reports can be downloaded free of charge at https://www.nap.edu.

The Value of Social, Behavioral, and Economic Sciences: https://www.nap.edu/catalog/24790

Evaluation of the Minerva Initiative: https://www.nap.edu/catalog/25482

A Decadal Survey of the Social and Behavioral Sciences: https://www.nap.edu/catalog/25335

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