



CONSORTIUM of SOCIAL SCIENCE ASSOCIATIONS

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August 14, 2015

The Honorable Cory Gardner
Committee on Commerce, Science and Transportation
United States Senate
Washington, DC 20510

The Honorable Gary Peters
Committee on Commerce, Science and Transportation
United States Senate
Washington, DC 20510

Dear Senators Gardner and Peters:

On behalf of the Consortium of Social Science Associations (COSSA), I would like to thank you for engaging with scientific stakeholders as you work to reauthorize the National Science Foundation (NSF). We appreciate the opportunity to provide input to the Committee on Commerce, Science and Transportation on maximizing the impact of basic research, particularly as it relates to NSF and social and behavioral science research. The following pages include responses to some of the questions posed by the Committee in the July 22, 2015 press release.

COSSA is a nonprofit national organization serving as a united voice for more than 100 professional associations, scientific societies, research centers and institutes, and colleges and universities who care about a robust social and behavioral scientific research enterprise. We represent the collective science policy interests of all fields of social and behavioral science research, including but not limited to sociology, anthropology, political science, psychology, economics, statistics, language and linguistics, population studies, law, communications, educational research, criminology and criminal justice research, geography, history, and child development.

Social and behavioral science research is supported across the federal government, including at the National Science Foundation, National Institutes of Health, Department of Justice, Department of Defense, U.S. Department of Agriculture, National Oceanic and Atmospheric Administration, federal statistical agencies, and many other departments and agencies that seek to answer complex, human-centered questions such as:

- How to convince a community in a path of a tornado to heed warnings;
- What are the best strategies for slowing the HIV/AIDS epidemic, or more recently, the Ebola crisis; and
- How to thwart cybercrime and protect Americans' privacy and security in an increasingly connected world.

The social and behavioral sciences are critical components of the STEM enterprise responsible for advancing knowledge about the human condition and uncovering the discoveries necessary for addressing complex societal challenges. I have enclosed examples illustrating ways that social and

American Anthropological Association • American Association for Public Opinion Research • American Economic Association • American Educational Research Association • American Historical Association • American Political Science Association • American Psychological Association • American Society of Criminology • American Sociological Association • American Statistical Association • Association of American Geographers • Association of American Law Schools • Law and Society Association • Linguistic Society of America • Midwest Political Science Association • National Communication Association • Population Association of America • Society for Personality and Social Psychology • Society for Research in Child Development

behavioral science research have made the U.S. safer, stronger, healthier, and more economically competitive.

I would be happy to provide additional information or answer any questions you may have in response to the points outlined below.

Question #1: What functions should the federal government, academia, and the private sector be encouraged to perform in driving the U.S. “innovation ecosystem” and how can they strengthen their partnerships to ensure the U.S. position as a global innovation leader?

It is important to understand the different roles—and appreciate the limitations—that the public, academic, and private sectors have in the U.S. “innovation ecosystem.” The function of the federal government in this ecosystem is to support the very best basic research—**across all fields of science**—in order to enhance our chances of uncovering the next big scientific breakthrough. By funding innovative, cutting-edge research across all disciplines, the U.S. is not betting on a single area of science to produce the next paradigm-altering finding. Instead, we are making investments that allow us to simultaneously uncover breakthroughs on all possible fronts, because we understand that it is impossible to predict where the path of basic research will lead us, other than forward. We as a country appreciate that the nature of basic science is to explore fundamental questions that may not have an immediate application, but that contribute to the scaffolding of knowledge that builds and progresses over time.

In 2013, more than 130 national associations, scientific societies, private sector entities, and colleges and universities signed on to a common set of [Guiding Principles for the America COMPETES Act Reauthorization](#). The joint statement laid out a number of shared recommendations for ensuring that the U.S. not lose momentum in the pursuit of new knowledge, especially at a time when our international competitors are ramping up their scientific investments. According to the guiding principles:

“Within the context of strong federal support for basic research, ensure that federal scientific agencies, guided by their scientific advisory committees and boards, continue to set priorities for funding within and among the full range of scientific disciplines. This principle has served the nation well for decades.”

The federal government has a unique role to play in supporting basic discovery across all fields of science.

With federal government support, researchers in academia play the role of discoverer; they are the explorers pushing into new frontiers of the unknown. What could be more in the national interest than investing in the best scientific minds to answer questions of national (and global) significance? Federal basic research funding has the power to attract and harness one of our most valuable resources—American innovation. To fully reap the benefits, basic researchers should be afforded the freedom to follow what the science tells them, to truly innovate, and to take risks without fear of political interference.

Looking specifically at NSF, discoveries enabled by NSF’s investments in the social, behavioral, and economic sciences often have profound impacts on people’s lives. As a result of this research, we are:

- Learning how to respond to disasters;
- Enhancing teaching and learning in education, including STEM education;
- Improving the safety of our troops in combat areas;
- Reducing violence among our youth;
- Improving public health;
- Modeling water planning to enhance sustainability;
- Improving the effectiveness of the criminal justice system; and
- Helping paralyzed individuals communicate, to name a few.

Finally, the private sector can be viewed as the “users” of basic research. Because market forces do not incentivize supporting research with applications that are not immediately foreseeable or easy to monetize, the private sector cannot be relied upon to be the primary funders or drivers of basic research. But it should be relied upon to find new, creative ways to interpret and translate basic research findings

into products, therapies, or practices that have the potential to benefit us all. Taken together, these three components of the “innovation ecosystem” form a powerful continuum of American ingenuity that is the envy of the world. It must be supported if we are to maintain our position as the global innovation leader.

Question #2: How can the federal government best structure, coordinate, and/or prioritize its R&D investment portfolio to provide predictability for research initiatives, facilitate the discovery of new knowledge, drive lasting economic growth, and address critical emerging challenges?

If the U.S. is to maintain its scientific competitiveness on the global stage, we as a nation must continue to prioritize investments in science and technology and not abandon the aspirations set forth in the original America COMPETES Act of 2007 and its reauthorization in 2010. For this next iteration, we need a roadmap that is just as ambitious.

There are two issues when we talk about prioritizing research investments: (1) ensuring that funding for research and development remains a priority function of the federal government, especially among competing interests and during times of fiscal restraint; and (2) questions about prioritizing specific fields of research for investment over others.

To the first point, earlier this year, more than 250 leaders of industry, universities, and scientific societies and associations signed on to [Innovation: An American Imperative](#), which was a call to action for Congress to invest in and enact policies aimed at maintaining the U.S. as the global innovation leader. Among the recommendations is to provide “steady and sustained real growth in funding of at least four percent for basic scientific discovery” across several basic research agencies, including the National Science Foundation. The U.S. is at risk of falling behind other emerging global scientific leaders because our commitment to providing predictable, yearly R&D increases has not kept pace with advancements in scientific discovery. The economic, national security, or health benefits of our investments in basic research tend not to be immediately realized, making these investments an easy target for cuts when budgets are tight and priorities need to be set. Science takes time; unfortunately, divesting in science today significantly slows the timeline of discovery down the road. The scientific enterprise requires stability, predictability, and sustainable growth.

As former House Speaker Newt Gingrich pointedly stated during a recent [Forum on Federal Investments in Science Research](#), “To allow research funding to languish at a time of historic opportunity to save lives and save money takes a special kind of stupidity that is reserved for this city,” noting that under his leadership Congress doubled the budget of the National Institutes of Health (NIH) while at the same time balancing the federal budget for four straight years. He added that he regrets not tripling the budget of NSF when NIH was doubled during the 1990s and early 2000s. Speaker Gingrich’s remarks remind us that it is possible to maintain support for basic research, and even make necessary new investments, while still being responsible stewards of the nation’s finances. The key is to make such investments a national priority.

Once it is determined that investment in basic research is in fact in the national interest and should be prioritized for funding, questions start to arise about whether to prioritize specific fields of research. Efforts in the House to arbitrarily pick winners and losers among scientific disciplines supported by NSF are misguided and pose real risks to the entire scientific enterprise.

As stated in the 2013 Guiding Principles, Congress should:

“Support funding increases without offsets that would force significant and potentially detrimental tradeoffs between one field of science and another. To ensure our national competitiveness, we need to maintain a strong foundation of basic research across all scientific disciplines, from the physical, mathematical and life sciences, to engineering, to the social, economic and behavioral sciences.”

In addition, the [Coalition for National Science Funding](#) stated in April:

“For the United States to remain globally competitive, it is essential that Congress continue to provide NSF the ability to fund grant proposals that advance knowledge in promising scientific areas, whether within or across fields, including the physical, mathematical, natural, social and behavioral sciences, engineering and computer sciences. This broad-based approach has driven

American pre-eminence in innovation for decades and will continue to serve us well long into the future.”

The scientific community strongly contends that experts at NSF, the merit-review process, and the vast network of scholars around the country who provide technical and content expertise to NSF leadership are best suited to advise the agency on how to use the funding it receives each year. We must support all areas of basic science, not place scientific disciplines in competition with one another for what are already scarce resources, thereby discouraging interdisciplinary science.

Efforts that take direct aim at social science suggests a lack of understanding about what social scientists do and the impact their research has on society. So many of the questions facing us today are left unsolved because we do not understand the human dimensions. Consider this: There are as many people dying from tornadic events today as there were 60 years ago, despite the tremendous advancements in weather prediction and modeling. Why? Because in the end, this is a human problem; technology is useless if we do not invest in furthering our understanding about how humans process information, make decisions, communicate with one another, and engage with technology.

NSF requires a reauthorization that preserves its authority to allocate funding based on an assessment of what is best for science.

Question #4: What principles should guide federal agencies in ensuring adequate transparency, oversight, and rigor in the process of funding, conducting, reviewing, and reproducing research?

The 2014 report, [*Restoring the Foundation: The Vital Role of Research in Preserving the American Dream*](#), published by the American Academy of Arts and Sciences, calls on Congress to “reinforce the use of expert peer review in determining the scientific merit of competitive research proposals in all fields.” NSF, which utilizes a merit-review system that is the best in the world, should be commended for its ongoing efforts to articulate the benefits of the research it funds across all scientific fields to the national interest of the United States. In particular, the requirement that grantees use non-technical language to explain their project and its national significance will help to communicate to all audiences the value of the work.

As the Committee works to reauthorize NSF, I hope you will take care to ensure that “political review” does not seep into the process of selecting research projects worthy of taxpayer support. Singling out certain areas of research—and singling out individual research grants—adds a layer of “political review” that is unworthy of the world-renown review process agencies such as NSF employ. Oversight of the use of taxpayer dollars is an important function of Congress. Unfortunately, actions in the name of oversight, specifically in the House, have taken the form of political interference, motivated by unilateral assessments about what defines research in the “national interest,” even if that research has been deemed meritorious by a panel of scientific peers. Political review should have no place in the U.S. basic research enterprise. It offers no contribution to ensuring the best science is funded and instead promises to discourage researchers from proposing high-risk ideas and reviewers from funding them.

Thank you again for the opportunity to express these views. I have enclosed additional materials that speak to the value of social and behavioral science research. Please do not hesitate to contact me at (202) 842-3525 or wnaus@coffa.org with any questions or if you require additional information.

Sincerely,



Wendy A. Naus
Executive Director
Consortium of Social Science Associations



CONSORTIUM of SOCIAL SCIENCE ASSOCIATIONS

CONTRIBUTIONS of SOCIAL and BEHAVIORAL SCIENCE RESEARCH to ISSUES of NATIONAL SIGNIFICANCE

The following pages include summaries of social and behavioral science research projects that have yielded important results for national security, public health and safety, and the economy.

ADDRESSING PUBLIC HEALTH

Youth Smoking Prevention. Adolescents tend to be more powerful in influencing their friends to start smoking than in helping them to quit, according to Penn State sociologists. In a study of adolescent friendship networks and smoking over time, the researchers found that friends exert influence on their peers to both start and quit smoking, but the influence to start is stronger because of availability of tobacco. While most current adolescent smoking prevention programs are aimed at building resistance to peer pressure, the study shows that school nurses and other health professionals may be able to design programs that use peer pressure to positively to influence behavior. For example, they could design programs to help nonsmoking adolescents help their smoking friends.

Preventing the Spread of Flu in Schools. Stanford University social scientists investigated methods to prevent the spread of flu-like infectious disease in school settings. Every student, teacher and staff member of one high school was outfitted with a credit card-sized wireless sensor to monitor contact for one whole school day and model social networks. The resulting models simulated how influenza infection would spread through the community based on real-world contact. The models also allowed researchers to explore strategies for deficient disease management such as vaccinations and school closings. Most vaccination strategies were no more effective than random vaccinations in preventing the spread of disease. However, social distancing strategies in which schools were intermittently closed (e.g., two days open, two days closed) interrupted the contact network, and were nearly as effective as a complete three-week school shutdown. These findings provide useful insight for school administrators and public health officials into the development of effective prevention strategies.

Organ Donation Matching. To address the high demand for kidneys and the challenge of finding a donor, economists have developed algorithms to facilitate kidney matching for patients who have willing but biologically incompatible donors. Based on their knowledge in game theory and market dynamics, a team of researchers from Harvard University, Boston College, and the University of Pittsburgh developed powerful match-making software that optimizes the process of identifying an appropriate live donor match with compatible blood types and antibodies. This system creates kidney exchanges that match an incompatible donor-patient pair with a similarly incompatible pair so that each of the patients receives a kidney from a compatible donor. The medical programs that use this software have already saved many lives

nationwide. The researchers are now investigating the increased efficiency between two-way and three-way matches, as well as more extended transplant chains. Alvin Roth of Harvard was a co-recipient of the 2012 Nobel Prize in Economic Sciences for his research on the practical applications of matching theory.

CONTRIBUTING TO NATIONAL DEFENSE & SECURITY

Nonverbal Communication to Transcend Language Barriers. A Washington University in St. Louis researcher and collaborators investigated emotion recognition using nonverbal cues such as facial expressions, vocal tones and body language. Based on this research, the Army Research Institute now incorporates education on nonverbal communication into soldier training, thereby assisting troops in understanding cross-cultural, nonverbal communication with non-English speaking citizens with whom they interact overseas. Thus, this research has the potential to provide human solutions in military situations. Enhancing troops' interpersonal skills can enable them to anticipate and diffuse conflict, as well as facilitate cooperation, negotiation and compromise.

Improving Port Security by Maximizing Efficiency. To ensure the safety of U.S. ports, a reliable process to inspect the millions of shipping containers that pass through U.S. ports each year is required. While several types of tests are available to inspect cargo and detect dangerous or illicit substances, including nuclear materials, developing a system that maximizes inspection efficiency while minimizing costs is a challenge. Researchers at Rutgers University considered these factors in developing new algorithms to improve port safety. These algorithms identified optimal decision-making for shipping container screening by analyzing types of inspection tests and shipping manifests. These tools not only have the potential to increase cost-effective methods of hazardous materials detection, they also can benefit decision-making in other areas such as public health.

THE COMMUNICATIONS REVOLUTION

Game Theory Revolutionizes Telecommunications. NSF-supported researchers provided the Federal Communications Commission (FCC) with its current system for apportioning the airwaves via a fruitful, practical application of game theory and experimental economics. Since their inception in 1994, FCC "spectrum auctions" have netted over \$60 billion in

revenue for the federal government. As wireless communication blossomed in the early 1990s, the FCC received a concomitant increase in requests to use the limited commercial frequencies of the electromagnetic spectrum. The upsurge rendered the FCC's lottery-based licensing method inadequate, but economists Paul Milgrom and Robert Wilson of **Stanford University**, and collaborator Preston McAfee had a solution: an auction system based on their research. The team's NSF-funded studies had already documented conditions under which the proposed spectrum auction was expected to perform well, and experiments in NSF-supported labs run during the FCC's decision-making process provided additional evidence that the new system surpassed the proposed alternatives. The U.S. system of partitioning airwaves is now emulated in several other countries around the world, resulting in **total worldwide revenues in excess of \$200 billion.**

ENSURING PUBLIC SAFETY

Keeping Tabs on Sex Offenders, Keeping Kids Safe. A team of researchers from **Drexel University, Indiana University, and Arizona State University** developed **spatial models to help manage the location of sex offenders.** Their research addressed concerns regarding the impact of sex offender residency laws on a community, as their end results are often unknown. They considered important factors such as whether residency restrictions lead to high concentrations of offenders in specific areas, distribute the risk across a community equitably, and keep sex offenders from living near minors. **These modeling techniques can provide legislators, law enforcement and public policy officials with the unique ability to make informed decisions about new policies prior to their actual implementation.** Thus, improving the development and evaluation of sex offender residency policies in advance of any legislation will allow public officials the opportunity to consider the resulting distribution of offenders in terms of local residents, better meeting the needs of communities.

Using Modeling to Cut Crime. With support from the National Science Foundation, a team of anthropologists, criminologists, and mathematicians at the **University of California, Los Angeles** created a mathematical computer simulation model of **crime pattern formation.** The model revealed that additional policing in certain crime "hot-spots" resulted in two alternate responses: relocation of the criminal activity to different areas or complete disbanding of the activity. In 2010, those **researchers collaborated with police departments** in Santa Cruz and Los Angeles to map crime hot spots in those cities. Their findings are helping police predict when crime can be suppressed by intensified police actions and when crime might merely be displaced to other neighborhoods. **As a result of this research, burglaries in Santa Cruz declined by 19% over a six-month period.** In 2011, *Time* magazine included predictive computer modeling as one of its *50 Best Inventions* for that year.

MANAGING NATURAL RESOURCES

Managing Natural Resources through Cooperation. Elinor Ostrom of **Indiana University** challenged conventional

wisdom and long-held theories on how best to **manage common natural resources.** She explored the role of **cooperation among people and the impact on overall economic benefit,** especially during a time of increasing global population and subsequent strain on available resources. Ostrom investigated efficient management of shared community resources such as forests, fish and water. She found that cooperative management of these resources by individuals, compared to outside agencies such as governments or private companies, can be highly efficient, resulting in greater sustainability and mutual economic benefit. **Ostrom is the first, and thus far only, woman to be awarded the Nobel Prize in Economic Sciences (2009).**

UNDERSTANDING HUMAN DECISION-MAKING

Making Good Choices Easier. Daniel Kahneman's (**Princeton University**) pioneering work in **behavioral economics** addressed how people make decisions when presented with potential risks and uncertain outcomes. He challenged standard economic theory that depicted people as largely rational and logical decision-makers in these situations. Kahneman demonstrated that the way information is presented can strongly influence people's decision-making. Such information framing is also referred to as "anchoring." Kahneman is known, too, for his work on prospect theory, in which he and collaborator Amos Tversky investigated how people make decisions, especially with respect to finances, when presented with alternatives that have known outcomes regarding gain or loss. They found that people often make predictably irrational decisions, due in part to a disproportionate aversion to losses compared to their level of desire for gain and a tendency to deny true risks that carry the potential for negative outcomes. **Kahneman received the Nobel Prize in Economic Sciences in 2002,** the first psychologist to win the award in economics.

Advancing Democracy. In 2010, the **University of Michigan and Stanford University** received a total of \$10 million as part of the **American National Election Studies (ANES)** project to inform explanations of **election outcomes.** [The] goal is to support the legitimacy and vibrancy of American democracy by producing credible measures of individuals' relationship to their government and to their country. For over 60 years, researchers have used this data to clarify many important aspects of how people feel about past actions of government, and how such feelings affects their willingness to contribute to society in a range of different ways, from the workplace, to the ballot box, to a range of volunteer organizations. The ANES is used by tens of thousands of scholars, teachers, journalists, and citizens around the world to not only better understand the current state of American democracy, but to compare the present to the past. Moreover, the ANES studies are **considered a benchmark for election surveys around the world.** In established democracies and new democracies, **National Election Studies support governmental legitimacy** by providing powerful and valid measures of the factors that affect citizens' feelings about, and contributions to, the nations in which they live.

American Sociological Association, http://www.asanet.org/press/peer_influence_leads_teen_to_start_stop_smoking.cfm
Association of American Universities, <https://www.aau.edu/WorkArea/DownloadAsset.aspx?id=14695>

Bringing People Into Focus: How Social, Behavioral and Economic Research Addresses National Challenges, National Science Foundation (NSF 13-62)

Out of Focus: A Critical Assessment of the Senate Report, "The National Science Foundation: Under the Microscope," A Staff Report by the Democratic Staff of the House Committee on Science, Space, and Technology,

<http://democrats.science.house.gov/sites/democrats.science.house.gov/files/coburn%20memo%20with%20cover.pdf>