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From Barriers to Bridges: Turning Great Science into Effective Policy

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<u>Challenge</u>: Turning established knowledge in the hard and applied sciences into effective public policy

This white paper from faculty in multiple departments at Texas Tech University outlines our view of what constitutes "grand challenge questions that are both foundational and transformative" in the Social, Behavioral, and Economic Sciences. It also forms our statement on future funding emphases. We begin with a thought experiment, asking practicing research scientists in all areas to choose which of the following three statements most accurately captures their views concerning the research they conduct and its importance to the world at large:

- We could more quickly and effectively improve the state of the world if we had funding to do research that will produce more basic scientific knowledge,
- We could more quickly and effectively improve the state of the world if we had funding to conduct research on how to turn what we already know into policy actions that are implemented with broad support, or
- Both.

To be sure, many if not most scientists would select the third choice, "both," because clearly, to make the world a better place, both emphases are necessary. In spite of this, if we followed up this question by asking which of the first two choices scientists think has received more emphasis in terms of research dollars and actual research time, the answer would have to be the first statement.

This thought experiment leads to two conclusions. First, whether researchers work in the hard, applied, or social sciences, they know well the value of conducting more fundamental research. Ssuch basic research is needed not only to advance the frontiers of the various sub-fields of science in which they work but also to solve outstanding problems and improve the state of the world. At the same time, all scientists have experienced frustration knowing that findings they have reported in appropriate refereed outlets remain unutilized. They are used by other members of the specific scientific community in which they were deemed appropriate for publication but they remain removed from the larger world of public policy and, thus, are kept from having any larger impact. Across the many fields of scientific endeavor, results and insights exist that, if turned into clearly defined policy actions, could result in making the world at large better off.

The reasons for this state of affairs converge on the well known fact that creating scientific knowledge is a different process from turning such knowledge into useful public policy with broadly applicable positive impacts. We can think of social scientific research as resting on a continuum that, on one end, is pure research but on the other end is purely applied research. Creating scientific knowledge rests on the pure science side of the continuum while turning basic knowledge into policy rests on the applied side of the continuum. Funding agencies have

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emphasized the pure science side of the continuum but have not spent nearly as much time on the applied side. This is not because one side is more scientific than the other because the applied side has been studied extensively. Indeed, the Nobel Prize winning work of Elinor Ostrom, *Governing the commons*, is in this applied realm, but is no less scientific. The problem is that most funding goes to the pure side of research to the detriment of research that could expand our knowledge of how to turn what we already into policy level knowledge and, thus, improve the state of the world.

Another reason for this state is that creating scientific knowledge is the world of basic research, but the world of implementation touches on the world of politics. This world is viscerally familiar to all scientists, but is defined by defined by institutions and procedures from those in which scientific research explicitly takes place. This is not to say that science and policy have no connection because there are many areas of research where there are natural bridges between these two worlds. For example, bioterrorism is a national security policy area where the knowledge that biologists have of weapons-potential pathogens is clearly recognized, leading to an essential dialogue between scientists and specialty and bioterrorism policy elites. It does mean, however, that there are many more scientific areas where there are no such bridges have been built. This condition results in important research findings remaining unimplemented.

The result of the current state of affairs is that the potential for useful policy derived from many areas of hard and social sciences is not realized. We discuss five examples that demonstrate the need to build bridges between basic scientific knowledge and useful public policy.

1) Drug Policy: Research from the disciplines of Political Science, Economics, Sociology, and Psychology on the costs of the approach that the United States has pursued in its “war on drugs” has shown clearly why the current approach has failed despite the enormous costs it has generated. A supply approach is one that focuses on those non-U.S. countries as well as domestic individuals who produce and supply drugs to the users in the United States versus one that focuses on users and emphasizes reducing the demand for drugs. The latter approach, one that could actually reduce demand, would be more cost effective, because in reducing demand for controlled substances it would also reduce the price that such substances receive on the street and diminish the incentive for individuals to be involved in such activities by lowering this activity’s potential payoffs. Unfortunately, the U.S. has pursued a supply policy at extremely high costs and with very little success. In light of this lack of success, it makes sense that more research on the psychology of addiction and the economics of managing the distribution of controlled substances, especially how to pursue such avenues in a manner that involves widespread support (because they make more economic and effective sense) should be a high priority, even if from the strict position of efficiency.

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2) Economic Sanctions in U.S. Foreign Policy: Economic sanctions are an often-used tool of U.S. foreign policy, but our basic research tells us that they are more often than not ineffective and do not lead to the results for which they were originally imposed. This is not problematic in and of itself, but it is a problem because imposed economic sanctions come with costs to the U.S. Sanctions result in losses to U.S. business firms and, thus, allow other foreign corporations to enjoy the fruits of the lost business to which they are partner. Despite this problem, sanctions have become more and more popular in the post-Cold War era. They may not be completely ineffective, but with the right information and influences, decision-making could be better informed, so that U.S. economic interests do not lose because of a dominant political calculation on the part of decision-makers.

3) Climate Change: The decisions that individual business and political actors make can hasten or slow the pace of climate change. This is particularly problematic when the fundamental science at the base of what we know about climate change is actively rejected and transformed into a campaign issue to achieve public office. The point is that, while we naturally need more basic research to understand the dynamics and implications of climate change, such knowledge is unhelpful when a significant class of elected officials, possessive of a broad swath of support, does not accept the science that the phenomenon even exists.

4) Educational Reform: As captured in standardized test scores, the performance of American students in science, math, and even English, overall, is not much better than dismal (Committee on Science, Engineering, and Public Policy, 2007). Ironically, cognitive research offers clear paths to improvement. To implement reform requires breaking down powerful administrative, political, and parental barriers. Given the increased pace of globalization and the growing importance of ensuring that our youth are indeed adequately educated, the question is why significant change has not occurred. Studying the mechanisms by which improvements can be implemented and made permanent would be useful and worthy of funding.

5) Population Forecasts: We all know that population projections are important, but the scientific aspects of such projections are very different from the way they are treated in the political process. Scientifically, population projections concern advances in demographic projections and other issues such as advances in human reproduction and diagnosis. Contrarily, the political aspects are consumed with such issues as abortion and illegal immigration, which is unfortunate because much of what is important in the science is not addressed in the policy process. Consider, for instance, the fact that populations with low levels of education have much higher birth rates than populations with higher levels of education. Such differential trends will have profound implications. One example concerns the future make up of U.S. scientists and the consumption of natural and social resources. In addition to this, consider the problem of immigration. Although we are still without a general theory of migration, we do have enough information that can help shape migration policies. Several studies show that networks are a

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central component of migration flows, and once a migration flow has started it is hardly possible to stop it by improving border control (Massey, Alarcon, Durand, González, 1990). Alternative methods, such as lowering push factors through economic development and pull factors by offering feasible alternatives to employers who hire undocumented workers, can work better and cost less than current employed policies.

These examples from the hard and social sciences represent just a few bits of scientific knowledge that could improve the state of the world, but fail to do so because they remain in journals and do not get into the policy process. There are clearly more examples but most important is the fact that they tell us that the United States excels at producing and publishing scientifically reputable results, but lags substantially at translating them into outcomes that could improve the lots of all affected by the research. The question then is not simply why this is the case, because we have good answers that range from the perfunctory to the detailed. Rather, the more important point is that we do not spend our research dollars and time studying how to overcome the barriers to why great science does not become great public policy. The challenge is to study how to change this state of affairs, a question that will require some fundamental research into how it is that scientific findings that have the potential to improve life on this planet can overcome the political, cultural, or other barriers that prevent what we know from being put to work to improve the state of the world. While this is the realm of the social and behavioral sciences, it has not received much attention from the National Science Foundation in terms of research dollars. That is where we here at Texas Tech University propose to focus, believing that assistance from NSF in this process will lead to foundational research that is truly transformative.

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