

THE ROLE OF SCIENCE IN POLICY

Scientists who contribute to policy are most effective when they have clear goals and a strategy for achieving them. Developing those goals and strategies starts, in my view, with thinking carefully about the role of science in policymaking.

In broad terms, there are two possible goals for engaging the policy process and two primary strategies for achieving those goals. The goals are either to improve policies that affect science (policy for science) or to improve policies that can benefit from scientific understanding (science for policy). Scientists attempt to achieve their goals by either providing information (i.e., educating policymakers about science) or by championing particular policy outcomes (e.g., by using persuasive arguments, political pressure, or positive incentives to achieve particular policy goals).

These goals and strategies for policy engagement can be combined in different ways, and they aren't necessarily exclusive: some combine both goals and strategies simultaneously. However, the different goals and strategies confer different risks and opportunities, and tensions can arise among those whose goals and strategies differ.

Most scientists recognize that the pursuit of objectivity in research, though perhaps impossible for any human to fully achieve, is a cornerstone of science. Science generates knowledge and understanding by attempting to eliminate potential sources of bias, often through controlled experiments. This pursuit of objectivity increases the credibility of scientific advances and expands society's willingness to take up and use the new knowledge and understanding science provides.

However, societal choices necessarily involve both objective information (e.g., what the potential response options are, what benefits and risks may be associated with those options, and how benefits and risks may be distributed among different groups or individuals) and subjective value judgments (what are the most desirable outcomes, how do we balance competing interests, or what we "should" do). This means that people can agree on a common set of facts relating to a societal challenge but disagree on appropriate policy responses.

The need for societal decision making to go beyond objective information contributes to a long-running and often contentious disagreement within the scien-

tific community on the appropriate role of scientists in civic discussions. Some argue that scientists should maintain their objectivity by avoiding civic engagement altogether or by focusing exclusively on providing information relevant to civic discussions. This helps, the argument goes, to ensure that scientific insights are as free from external influences as possible and are perceived as unbiased, accurate, and legitimate.

Other scientists argue that membership in society confers a right or even a responsibility to engage more actively in civic discussions. Scientists possess specialized knowledge relating to societally relevant topics and best understand how to integrate that knowledge into decision making, this argument goes. Direct participation increases the likelihood that society will make choices that help manage risks and realize opportunities.

Even among scientists disposed to civic engagement, differences arise based on the range of ways that scientists can choose to participate in policy discussions. The difference between scientific debates and courtroom advocacy is particularly illustrative.

In the courtroom, advocates make the strongest case on behalf of their client that they possibly can. It isn't the lawyer's job to make the counter case. That falls on the other side. This can be a powerful approach for winning a public debate or influencing a decision. Science, in contrast, relies on a full and objective assessment of the evidence. Scientists have an obligation to identify conflicting evidence, expose weaknesses in their analysis, and offer plausible alternative interpretations. This is a powerful approach for expanding knowledge and understanding and for building credibility as a source of information.

The policy process includes elements of both courtroom advocacy (e.g., the two-party system in the United States) and scientific assessments of information (e.g., the role of scientific advisory boards, or the Congressional Budget Office and the Congressional Research Service). Scientists who engage with the policy process must decide whether to engage in a manner that is consistent with science but that is sometimes at odds with the norms of the policy process, or vice versa.

Notably, the difference between those who favor one approach or another is based on value judgments. It is a philosophical difference of opinion relating to the appropriate role of scientists in society for which

there is no clear scientific answer. However, the different approaches do have potentially significant implications for how effectively science can contribute to the broader society and how others in society will view science. There are opportunities and risks associated with each approach.

A focus on providing information, which is the approach the AMS takes, increases credibility and helps open doors, particularly over time as trust builds with policymakers. For institutions, a focus on information also makes it possible for people with divergent views and interests to come together and coexist. However, providing information isn't always the most effective approach to achieving a specific policy objective or outcome.

One partial and imperfect solution, that in my view can work well, is to explicitly and assiduously differentiate scientific information from personal opinions when engaging in civic discussions. With this approach, a scientist can say what policy choices

(s)he thinks are best as long as it is clear to the policymaker that the conversation has moved beyond scientific questions.

Of course, no single approach to issues as complex as these will apply in all cases or for all members of our community, but there is great value in understanding what the options are and the risks and opportunities associated with each. This helps insure that individuals and organizations that choose to engage the policy process will be cognizant of the potential implications of their choices for the broader scientific community. As a result, careful consideration of the role of science in policy is a critical first step for anyone interested in contributing to the policy process.

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FOR FURTHER READING

Higgins, P. A. T., K. M. A. Chan, and S. Porder, 2006: Bridge over a philosophical divide. *Evidence & Policy*, **2**, 251–257.