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The Roles and Influence of Congressionally-Chartered Honorific Organizations on STI Policy Decision-making in the United States

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This paper provides an overview of Congressionally-chartered honorific organizations that are focused on science, technology, and innovation (STI). It describes the role these organizations play in policy-making and their influence on policy decisions.

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WHAT ARE CONGRESSIONALLY-CHARTERED HONORIFIC ORGANIZATIONS?

In order for Congress to charter an organization, it must do so by passing a law. Congressionally-chartered nonprofit organizations that have as their purpose the promotion of patriotic, charitable, and education activities are listed in Title 36 of the US Code and include organizations such as the American Chemical Society, the Boy and Girl Scouts of America, and the Daughters of the American Revolution.[1] There are about 100 such organizations. Within this broad category are organizations whose members are elected as an honor for their achievements. These Congressionally-chartered honorific organizations include the American Academy of Arts and Letters (founded in 1780), the National Academy of Sciences (NAS; founded in 1863), and the National Academy of Public Administration (NAPA; founded in 1967).

While generally independent in operation, with the ability to elect their members and officers, the organization may have certain obligations to the Federal Government. For example, the National Academy of Sciences section of Title 36 states that

> On request of the United States Government, the corporation shall investigate, examine, experiment, and report on any subject of science or art. The corporation may not receive compensation for services to the Government, but the actual expense of the investigation, examination, experimentation, and report shall be paid by the Government from an appropriation for that purpose.[2]

In addition, these organizations are sufficiently under Congressional jurisdiction that Congress can change the laws under which they operate. In the mid-1990s, several organizations objected to the National Academy of Sciences closed committee meetings, contending that the Academy was a quasi-governmental body and was subject to the Federal Advisory Committee Act (FACA). FACA requires not only that nearly all committee meetings be open to the public, but that committee membership be "fairly balanced in terms of the points of view represented" and that committee advice be objective and accessible to the public.[3] While NAS does attempt to balance bias and avoid conflicts of interest, its committee member deliberations are closed to the public to ensure committee independence. A series of legal actions ended with a Supreme Court ruling that let stand a lower court ruling that the National Academy of Sciences was subject to the FACA when developing reports for the Federal government. After the Supreme Court ruling, the U.S. Congress modified FACA (P.L. 105-153) in 1997.[4] In a compromise "Section 15" of FACA, which applies only to NAS and NAPA, Congress tried to balance both the court ruling to make NAS committees subject to FACA while maintaining some elements of the previous operation to maintain independence from legislative and executive branch influence. These included posting the biographical information of committee members and making their appointments provisional and open to public scrutiny for a limited period of time, opening committee information-gathering sessions while closing deliberative sessions of meetings, and providing the names of the originally anonymous reviewers in the final report. This was the first time Congress took action to influence the activities of these private organizations.[5]

Although both the NAS and NAPA conduct studies for the federal government focused on science, technology, and innovation, this paper will discuss only the activities of NAS.

WHAT IS THE ROLE OF THE NATIONAL ACADEMY OF SCIENCES IN ADVISING THE FEDERAL GOVERNMENT?

President Abraham Lincoln signed the congressional charter for the National Academy of Sciences in 1863.[6] The NAS, the National Academy of Engineering (NAE; founded in 1964), the Institute of Medicine (IOM; established in 1970) and their operating arm, the National Research Council (NRC; established in 1916), are known collectively as "The National Academies" and are private, non-profit organizations, not part of the federal government.[7] In all three academies, members are elected by current members for their contributions to science, engineering, and medicine, respectively.

Using committee report development and an extensive review process, the National Academies issue approximately 200 reports a year on a wide range of science and technology topics. Each academy individually, and the three academies collectively, conduct studies, but most are conducted through the NRC. NRC study committees consist primarily of individuals who are not members of the three academies, but who are experts in their field on the issue under discussion. Members of committees are not paid for their time, but are reimbursed for their expenses.

WHAT PRINCIPLES GOVERN HOW NATIONAL ACADEMIES STUDIES ARE CONDUCTED?

The key underlying principles under which all National Academies reports are developed are that they are "independent, objective, and non-partisan with high standards of scientific and technical quality."[8] Institutional credibility is one of the National Academies' most valuable assets. To maintain this credibility, a number of checks and balances are used

throughout the study process. These include:

- *Review of the study statement of task to ensure that the study is appropriately framed:* A study may be turned down by the governing board if it is not framed appropriately or not within the expertise of the National Academies.
- *Independent appointment of committee members:* Study sponsors and the public can suggest committee members, but the NRC chair selects who is appointed.
- *Selection process:* Committee members are selected based on their expertise, not their organizational affiliations; overall committees have a balance of perspectives and no members have a conflict of interest related to the report outcome.
- *Confidential process:* Closed and confidential committee deliberations, report drafts, data, and analyses ensure that there is no outside influence on a committee's report until the report is reviewed and released to the public.
- *Peer review:* The committee's report is reviewed by individuals with expertise that mirrors that of the committee and with a variety of perspectives. The names of reviewers are not revealed to the committee members until after the report is approved for release.
- *No spoilers:* Sponsors and members of Congress and the Administration interested in the study's results are not informed of the report's findings, conclusions, and recommendations until a few days prior to public release.

HOW ARE NATIONAL ACADEMIES REPORTS DEVELOPED?

There are five major steps to the National Academies report development process:

1. Defining the study and approval of the study scope and plan by the NRC Governing Board, including the study budget (typically $500,000 to $1 million) and time frame (usually 12–18 months).
2. Selection and approval of the committee, including: suggestion of committee members by internal and external organizations; approval by the NRC chair; posting of provisional slate for public comment; review of balance and expertise of committee slate; review and investigation of potential sources of conflict of interest both before and during the study; and final approval.
3. Deliberation on answers to the study questions by the committee, including in-person and virtual meetings, information gathering via in-person discussions and data collection, and report drafting.
4. Report review by experts in the field and those with different points of view, including responding to the review comments in writing, and final approval by the Report Review Committee and National Academies leadership.
5. Release of the report, including pre-briefings of sponsors and key leaders a few days prior to the report issuance; provision of the final report on an embargoed basis to reporters; and release of the report to the public, often as part of events where members of the public can ask questions either in person or virtually.[9]

WHAT IS THE IMPACT OF NATIONAL ACADEMIES STUDIES ON U.S. STI POLICY?

The impacts on public policy of the many studies that the National Academies have issued are innumerable, but provided below are some examples from a recent analysis conducted for the 150th anniversary of the National Academy of Sciences as to public policies where the National Academies provided "the foundation for some of the U.S.'s most significant accomplishments:

- Creating a national forest system and the National Park Service;
- Forming the U.S. Geological Survey;
- Opening the Panama Canal;
- Building a national highway system;
- Establishing uniform nutritional guidelines;
- Launching the U.S.'s first earth-orbiting satellite;
- Developing ways to mass-produce penicillin and other lifesaving medicines;
- Mobilizing conservation and protection of natural resources and the environment; and
- Mapping the human genome.[10]

WHAT CHALLENGES ARE CREATED BY THE NATIONAL ACADEMIES PROCESS?

One key issue is funding. Although the president, executive branch agencies, and members of Congress can request that the National Academies conduct a study, the study must be funded for it to be undertaken. This funding supports committee member expenses, staff, and administrative and operating expenses. Typically, reports requested by members of Congress are funded via a federal agency, but agencies are not required to do so unless funds are appropriated.[11] For example, the Clean Air Act Amendments of 1990 proposed a number of studies, but only a small number were funded.

In addition, because National Academies studies are funded by "soft money" (the employment of the vast majority of staff is dependent on funding for studies), there are concerns that a particular NRC entity might be "captured" by a Federal agency—that is, more likely to produce results that

are supportive of an agency's action in order to increase the likelihood of future funding—or, alternatively, staff leave as funding dwindles or ends, resulting in high staff turnover rates and loss of institutional memory.

Other concerns that have been expressed about National Academies studies are that they are too expensive, take too long, and are more likely to result in a "lowest common denominator" result due to the policy of achieving consensus. An overriding issue is that the quality of National Academies studies varies depending on the nature of the charge, the committee chair, and the staff involved. A particular concern is if a study is "orphaned" when the staff member managing it leaves and thus the institutional memory is lost.

A general issue is that the goal of maintaining neutrality on most policy issues influences the ability of the National Academies to issue statements of importance to the science, engineering, and medical community. While some believe this approach is appropriate, others believe that this action limits the voice of the community as a whole.

WHAT ARE ALTERNATIVES TO THE NATIONAL ACADEMIES REPORT DEVELOPMENT PROCESS?

Policymakers who are interested in alternatives to the National Academies process have a number of options. They can pose the same question to a federal agency-managed advisory committee. Examples include the President's Council of Advisors on Science and Technology, the Environmental Protection Agency's Science Advisory Board, and the Defense Science Board. Since these committees generally are already funded and staffed, they can begin quickly so the time for a response to the policymaker question is shorter and they are likely to better understand funding and implementation challenges; however, because they are funded and managed by agencies or political appointees (including selecting who is on the committee), they are viewed as less independent.

Another alternative is asking a non-partisan think tank with no political agenda to conduct the study. Organizations such as RAND, the Institute for Defense Analysis, and the Battelle Memorial Institute have the ability to gather new information and data while the National Academies primarily relies on existing information; however, these are not "consensus studies" among top experts from throughout the country so, in some cases, they reflect the point of view of their analysts and are thus more analogous to a journal paper.

A third option is relying on existing analytical resources such as the Congressional Research Service, Government Accountability Office, Congressional Budget Office, and Federally Funded Research and Development Centers. These organizations may fall into a category of being so neutral that they are unwilling to make the leap to recommendations or are specifically limited from doing so based on their statute.

HOW DOES THE UNITED STATES COMPARE TO OTHER NATIONS?

Many nations have academies of science (over 100 worldwide), but they widely differ in operation and all have evolved over time.[12] The first academy of science, the Royal Society in the United Kingdom, which celebrated its 350th anniversary in 2010, is focused on the discussion of scientific research. Unlike the National Academy of Sciences, the Royal Society does not have a formal, official governmental role. That being said, it does have a Royal Charter (1662), and one of the first activities conducted by the Royal Society was a study on the state of Britain's forests for King Charles II in 1664.[13] Today, the Royal Society's policy studies focus on four themes—diplomacy, governance, innovation, and sustainability—and includes studies on topics such as the "changing nature of global science, the implications for society for developments in rapidly developing areas of science and technology, science funding, and how science can inform debates about sustainability."[14]

The Chinese Academy of Sciences (CAS), founded in 1949, "was set up under the administration of the State Council, as a government institution for the management of the nation's scientific research," and has a mission

> to conduct research in basic and technological sciences; to undertake nationwide integrated surveys on natural resources and ecological environment; to provide the country with scientific data and advice for governmental decision-making, and to undertake government-assigned projects with regard to key S&T problems in the process of social and economic development; to initiate personnel training; and to promote China's high-tech enterprises by its active involvement in these areas.[15]

In contrast, the National Academy of Sciences does not conduct research per se; however, in 2012 "as part of legal settlements with the companies involved [in the Deepwater Horizon oil rig explosion], the federal government asked the National Academy of Sciences to establish a new 30-year research program focused on human health and environmental protection in the Gulf region."[16] Besides research and development, the program will include education, training, and environmental monitoring.

On innovation, the Chinese Academy of Sciences prepared a report on "2020 Leapfrog Development of the Knowledge Innovation Program (KIP)," which perhaps was not that different in focus from the National Academies report "Rising Above the Gathering Storm: Energizing and Employing America for a Brighter

Economic Future" that also focused on science, technology, and innovation. The CAS report made recommendations that were reviewed by the national government and then passed back to the Academy to implement. In the case of the "Gathering Storm" report, which was developed in response to a Congressional request, the report went back to Congress and resulted in passage of the "America Competes Act" a few years later. The National Academy of Sciences, however, does not play a role in implementation. That role instead fell to the White House and federal agencies such as the National Science Foundation, the Department of Energy, and the National Institute of Standards and Technologies.

Other academies of science actively providing advice to their government include the Royal Swedish Academy of Sciences (1739) which indicates that part of its mission is "to act as a voice of science and influence research policy priorities,"[17] the Royal Netherlands Academy of Arts and Sciences in Amsterdam (1808) founded as "an advisory body to the Dutch Government" and is currently conducting studies on the value of research, biosecurity, and healthcare technology,[18] and, more recently, the German Academy of Sciences, Leopoldina, which was recognized by its government officially in 2007 and issues studies on topics such as "climate change, energy supply, disease control and health, demographic change, global economic systems, conflict research and the use of natural resources."[19] The German Academy of Sciences principles for conducting its studies are similar to those of the National Academies:

- Transparent working methods that are documented in a reproducible way
- Open and unbiased design of advisory process through inclusion of different disciplines
- Statements that are developed independently of any economic and political interests giving recommendations on how to approach specific problems facing society
- Clear presentation and broad dissemination of recommendations in order to encourage public debate[20]

In addition, there are academies of science in emerging countries in Africa, a third-world academy of sciences, and the Interacademy Panel, an international body that brings academies of science together to make policy statements. The panel has made statements on issues such as the teaching of evolution, climate change, biosecurity, and access to scientific information.[21]

SUMMARY

As the importance of S&T has increased over the centuries, so has the role of honorific academies in providing science, technology, and innovation advice to their governments. Their degree of independence may vary, but the influence of that advice is clear and illustrates the respect these governments and the public have for scientific, technical, and medical advice—even when they disagree with that advice. This does not mean, however, that the process used by the U.S. National Academy of Sciences could not be improved. Table 1 summarizes what works well and related areas for improvement.

Table 1. What works and what does not in the National Academies process

Areas that Work Well	Related Area for Improvement
Enhanced policymaker decision-making based on science and technical information	Decrease study time to shorten response time relative to policymaker decision-making needs
Independence of study activities from political process by non-governmental National Academies leadership selecting committee members and closing deliberative discussions	Increase understanding of policymaker challenges such as public opinion, budget, and other issues to improve likelihood of recommendation implementation
Volunteer committee members who contribute their time for public service, providing substantial economic resources	Reduce costs and delays due to lengthy process of study prospectus approval, fundraising, and management; and avoid "capture" of board by funding agency
Balanced committee membership that includes demographics, balance of bias (points of view), and no financial conflicts of interest	Incorporate other's knowledge and perspectives such as those with strong points of view or financial interests
Synthesis of data and information to produce a consensus point of view, versus individual papers	Collect and analyze new data and information to expand what is available
Anonymous review process that ensures report answers questions in its charge and is based on sufficient scientific and technical information	Avoid weak recommendations with limited policymaker utility, sometimes caused by reviewer comments when they have not learned all committee has during study

Endnotes

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