

The National Science Board

Communicating Science and Technology In the Public Interest



NATIONAL SCIENCE BOARD

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NATIONAL SCIENCE BOARD

COMMITTEE ON COMMUNICATION AND OUTREACH

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* Term ended May, 2000.

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Communicating Science and Technology in the Public Interest

INTRODUCTION

Science and technology are a pervasive presence in our lives. The way we work, communicate with one another, stay healthy, and play are all profoundly influenced by the results of scientific inquiry. In such a world, increasing the public's understanding and appreciation of science and technology is of paramount importance.

The science and engineering community has always recognized this imperative. Yet it has not been as successful as it needs to be in encouraging communication of science and engineering knowledge and research results to a wider public audience. There are few incentives — and in some cases, severe disincentives — for scientists to make their own work or that of others accessible through popular literature or the broadcast media.

The National Science Board Strategic Plan (NSB-98-215) has identified public understanding and appreciation of science and technology and public outreach by the science and engineering communities as essential for successful science and technology policy that will benefit society (Appendix I).

Scientists have wonderful stories to tell, yet too often they get told poorly, if at all. Educators and journalists have a role to play in communicating the achievements of science, but scientists must recognize that they, too, have a responsibility to increase the availability and salience of science to the public.

**Unlocking Our Future:
Toward a New National
Science Policy**, House
Committee on Science,
9/24/98

COMMITTEE CHARGE AND FOCUS

In spring 1999, the National Science Board Committee on Communication and Outreach was established to provide guidance on the role that the Board and the Foundation should play in expanding public awareness of science and engineering and of NSF's mission in promoting discovery and the development of the Nation's human resource base. The Committee was charged to:

- Communicate the importance, challenges, and opportunities of science and engineering to policymakers and government leaders; and
- Define the role that NSF should play in generating public appreciation and awareness of science and of the agency's mission to promote discovery and the development of the U.S. human resource base.

The complete charge to the Committee is provided in Appendix II.

In the course of its deliberations, the Committee focused particularly on:

- Defining the role the Board and NSF should play in generating public awareness of NSF's mission and of the contributions of science and engineering to society's well being;
- Strengthening outreach efforts already underway by the NSF Director; and
- Exploring the role the community should play in informing the public about the importance of science and engineering, and determining how NSF can support that role.

Science literacy, while related to the matter of the public's understanding of science, was not considered to be a primary focus of the Committee.

The Committee reviewed a variety of communication and outreach issues and initiatives to help shape its recommendations. This was done largely through guest speakers at Committee meetings (listed in Appendix III), a public symposium entitled “Communicating Science and Technology in the Public Interest” (agenda in Appendix IV), and a review of current efforts at NSF.

The Committee arrived at a set of findings and recommendations that can be grouped into three broad categories:

I. Need For Increased Advocacy For Science and Engineering

- The National Science Foundation plays a critical role in the advancement of science and technology, and its message needs to be developed and reiterated — an investment in NSF is an investment in discovery and in economic growth. The public regards basic science as important and prestigious work that deserves significantly more public funding than it is getting. However, despite the fact that over 80 percent of the public has a generally positive reaction to science, only four percent of the public can correctly identify the National Science Foundation.
- Several disturbing U.S. trends necessitate greater advocacy for basic science:
 - Dwindling number of science and engineering students;
 - A shortage of technically skilled workers;

- A persistent lack of interest in science and engineering among women and minorities;
- An increasing proportion of R&D carried out by industry (industry R&D tends to be more applied than basic);
- A decline in science news aimed at the public: for example, of the estimated 1,700 daily newspapers in the U.S., only about 30 of them cover science routinely, and the volume of that coverage is decreasing.

- The NSB Strategic Plan states that “... the public has a reasonable expectation that scientists will contribute to demystifying for others what is so personally and professionally engaging to them. The challenge to do so is the essence of what former NSF Director Neal Lane has called ‘civic science.’” Scientists and engineers need to be more accessible and more accountable; they need to be articulate and clear about their work and the good it is doing for society; and they need to be willing to lead or participate in public information efforts in a wide variety of public forums, from schools to the media.
- Nonprofit membership organizations supporting grassroots public education and advocacy in specific areas of research have proven effective in informing the public. Specifically, the model used by Research!America has helped inform the public about the biomedical sciences. A similar type of multi-organizational group, established to address disciplines supported by NSF, would heighten public understanding of and appreciation for the role of science and engineering in society.

Recommendation I:

The National Science Board encourages the science and engineering community to establish a broad-based public information group to increase the American public’s appreciation for science, engineering, and fundamental research.

Action:

Consistent with its statutory responsibility to encourage policies that promote research and education in science and engineering, the National Science Foundation should regularly provide requested information to public information groups to support their outreach efforts.



FINDINGS AND RECOMMENDATIONS

II. Need For Increased Collaboration Among NSF Communication Efforts

The National Science Foundation has a number of distinctive strengths in its current and planned activities for supporting research on communication, as well as education and training efforts to disseminate information about science and engineering. Specifically:

- Basic research in the Directorate for Social, Behavioral and Economic Sciences (SBE) provides a foundation on which to build an understanding of effective communication. NSF funds at least 10 programs within SBE that address communications research (Appendix V). These programs are constantly evolving in response to the growth and changes in their respective communities.
- The Directorate for Education and Human Resources (EHR) has a vital contribution to make toward an ongoing NSF effort to support education, training, and public understanding of science and engineering. EHR is planning a new public education initiative involving cross-directorate coordination, multi-agency collaboration, and industry partnerships. This initiative will inform the public about contemporary research on a regular basis using a wide variety of media outlets.
- The NSF Office of Legislative and Public Affairs (OLPA) plays a critical role in disseminating current information about science and engineering research and education to the media and the public. OLPA develops and distributes a wide variety of useful materials to the Congress and to the public.

Recommendation II:

The National Science Board urges increased collaboration among NSF programs that focus on communication research, education and training, and information dissemination.

Action 1:

NSF should leverage the agency's communication and outreach efforts by increasing collaboration among the directorates and offices. In particular, NSF should pursue a coordinated, agency-wide initiative that would:

- *Explore how new communication technologies can be used to reach wider audiences;*
- *Identify research findings and "best practices" that can be applied to communicating science and engineering;*
- *Increase efforts to form liaisons with and disseminate information to higher education organizations such as the American Association of State Colleges and Universities (AASCU), the Association of American Universities (AAU), the American Council on Education (ACE), and the National Association of State Universities and Land Grant Colleges (NASULGC);*
- *Support training opportunities for increasing the active involvement of scientists and engineers in science communication;*
- *Support graduate education initiatives that enhance media and public communication skills; and*
- *Develop metrics for assessing the effectiveness of NSF public understanding and outreach communication activities.*

Action 2:

NSF should develop appropriate programmatic responses and report progress to the Board in May 2001.

III. Need For an Expanded Role of NSB Members in Communicating Science and Engineering

The status, knowledge, and visibility of the National Science Board places it in a unique position to promote understanding and appreciation of science and engineering. Individual Board members have a variety of untapped communication assets that can and should be strategically employed. Each NSB member, in a manner most appropriate and available to him or her, should become a “personal ambassador” of fundamen-

tal science and engineering. This will require NSF to provide:

- Briefing materials and talking points with a focused, consistent message about key issues facing the science, engineering and education communities;
- Educational materials for general dissemination to the public; and
- Information that could be useful in discussions between NSB members and congressional staff and members of Congress.

Recommendation III:

National Science Board members should expand their roles as “personal ambassadors” of fundamental science and engineering and of the NSF mission.

Action:

NSF should proactively, and in a timely manner, provide members with materials about key issues in science and engineering research and education so they can fulfill their roles as personal ambassadors. Responsibility for developing these materials will be determined internally by NSF. Examples of materials that could be useful to NSB members include selected speeches and visual presentations by the Director and Deputy Director, opinion and editorial statements, and published articles.

CONCLUSION

Since its founding 50 years ago, the National Science Foundation has been an important and vital catalyst for discovery and innovation. NSF-supported fundamental research has consistently changed and enriched our world. With its mission to support and fund the underpinnings for all research disciplines, and the connections between and among research disciplines, NSF has a distinct set of responsibilities. The agency must keep all fields of science and engineering focused on the furthest frontier, recognize and nurture emerging fields, and prepare coming generations of scientific talent. In addition, the agency must find ways to improve the way it communicates with the public about the value and meaning of science and engineering.

This report has focused on three broad recommendations to enhance communication efforts. Implemented successfully, these recommendations will contribute to an increase in public appreciation for the role of science and engineering in society and a greater understanding of the benefits of support for fundamental research.



NATIONAL SCIENCE BOARD STRATEGIC PLAN STATEMENT ON PUBLIC UNDERSTANDING AND ENRICHMENT

Excerpt from: *Toward The 21st Century: The Age of Science and Engineering*, National Science Board Strategic Plan, NSB-98-215, November 19, 1998.

Public Understanding and Enrichment

The ability of all members of society to participate in the 21st century will depend on literacy in science and technology at home and in the workplace. Far from being luxuries, public understanding of science and some degree of science and mathematics literacy are tools for workaday problem solving and essential to individual and collective decision-making. They undergird the long term investments that invariably characterize a successful science and technology policy, both with respect to enhancing the public's familiarity with the growing number of funding and policy issues that have science and technology content and its appreciation for the uncertainty that necessarily accompanies the process of discovery.²⁷

Retrieving and applying knowledge to new problems and situations will become an even more important life skill in the 21st century. Information technology has enormous potential for nurturing this skill efficiently and creatively, powerfully engaging the interest and sense of play of individual explorers. Images in an electronic age have a profound impact. They provide opportunities to excite us all, but especially students, to learn more about the natural world and how it works. The burden of creating these opportunities falls not only on the formal K-12 system, but also on "informal science" — on museums, science centers, the mass media, and the Internet — that has the

ability to deliver wondrous educational experiences outside a classroom setting.

Too few Americans – about one in five – either comprehend or appreciate the value or process of scientific inquiry.²⁸ While the scientist may expect the lay citizen, by dint of interest and initiative, to educate her or himself to the mysteries of the natural world, the public has a reasonable expectation that scientists will contribute to demystifying for others what is so personally and professionally engaging to them. The challenge to do so is the essence of what former NSF Director Neal Lane has called "civic science."²⁹

Through its outreach activities and policy guidance, the Board will:

- Enlist the science and engineering communities to engage with the public and communicate the joy and fascination of science, as well as its utility;
- Communicate the significance, challenges, and opportunities of science and engineering to policy makers and government leaders whose decisions regarding national investments will affect the ability of science and engineering to benefit society; and
- Take advantage of the revolution in access made possible by information technology to promote public understanding of science, mathematics, and technology, and build bridges between formal and informal science education.

Footnotes:

²⁷ James Sensenbrenner, Chairman, House Committee on Science, 105th Congress, 2d session, introduction to *The Role of Science in Making Good Decisions*, National Science Policy Study Hearing (10 June 1998).

²⁸ *Science and Engineering Indicators - 1998*, pp. 7-8 through 7-10.

²⁹ Neal Lane, "Thin Ice Over Deep Waters: Science and the American Dream: Healthy or History," Remarks at the AAAS Annual Meeting (Baltimore: 9 February 1996).

CHARGE TO THE COMMITTEE
ON COMMUNICATION AND OUTREACH

NSB 99-94
June 1, 1999

CHARGE
NSB COMMITTEE ON COMMUNICATION AND OUTREACH

At a time when science and engineering are critically important to society, to the economy, and to individual well-being, the public's awareness of their importance remains limited. This limited appreciation of the impact of discovery and innovation on all facets of life discourages meaningful engagement by all sectors of society on a broad range of national and local issues. Within its Strategic Plan (NSB-98-215), the National Science Board identified public understanding of science and technology and outreach by the science and engineering communities to the public as essential to the long term investments that characterize a successful science and technology policy.

The Committee on Communication and Outreach is established to develop guidance on specific strategies that the Board and the Foundation might employ to enhance communication and outreach to the public. The committee will develop guidance and recommendations on strategies to:

- Communicate the significance, challenges, and opportunities of science and engineering to policymakers and government leaders whose decisions regarding national investments will affect the ability of science and engineering to benefit society; and
- Define the role that the National Science Foundation should play in generating public awareness of science and of the NSF mission to promote discovery and the development of the Nation's human resource base, with specific attention to:
 - Enlisting the science and engineering communities to communicate to the public both the fascination and utility of science and engineering;
 - Capitalizing on the revolution in information technology to promote the public understanding of science, mathematics, and technology, and build bridges between formal and informal science education.

The Committee on Communication and Outreach will report to the Board at the July 1999 NSB meeting, and present a preliminary plan of action. The committee will present a final report to the Board at the May 2000 meeting of the National Science Board.

Eamon M. Kelly
Chairman



INFORMATION GATHERING ACTIVITIES

To inform the formulation of its recommendations, the Committee reviewed a variety of communication and outreach issues and initiatives. This was done largely through guest speakers, a review of current efforts at NSF, and teleconferences among Committee members.

July Committee Meeting

At the July 1999 NSB meeting, the Committee met with four internal NSF speakers and two external speakers. NSF Director **Rita Colwell** encouraged CCO members to concentrate on increasing general acknowledgment and understanding of NSF, considering how best to communicate this to our most important audiences, and coordinating activities with NSF's Public Affairs Advisory Group. NSF General Counsel **Larry Rudolph** clarified the legal limits on legislative advocacy by NSB members. NSF Office of Legislative and Public Affairs (OLPA) Director **Julia Moore** described the basic elements of a communications plan. OLPA Deputy Director **Joel Widder** provided an overview of the Congressional budget process as it relates to NSF.

Two external guests discussed the effectiveness of science and engineering communication from Congressional and media perspectives. Former Staff Director of the House Appropriations Subcommittee **Dick Malow** emphasized that NSB has a strong message that needs to be reiterated and developed — an investment in NSF is an investment in discovery and in economic growth. He urged Board members to learn and understand the Congressional budget process, cultivate key staff members, and develop non-partisan approaches and messages.

Washington Post science editor and writer **Curt Suplee** asserted that the past 15 years have been science reporting's "hey-day." However, he identified three trends that alarm him: (1) the Nation's daily newspapers are losing readers; (2) the remaining readers are growing older; and (3) advertising for science sections is drying up. Of some 1,700 daily newspapers in U.S., only 30 (at most) cover science

regularly; and the volume of that coverage is decreasing. New technologies, such as the web, are changing the face of news business, and nobody knows quite where it's going. Mr. Suplee observed that the science and engineering community is a silent constituency — editors don't hear enough from them. He concluded with a bit of "good" news: there is a massive outreach by major newspapers toward schools and youth, through Newspapers in Education (NIE), with focus on 9-13 year olds.

February NSB Symposium

At the NSB Chair's request, the Committee organized a public symposium at the Board's annual policy meeting in February 2000. The Symposium agenda (Appendix IV) was designed to focus on four topical areas: what we know, what we see ahead, what others are doing, and what NSB and NSF must do.

The Symposium keynote address on *Public Advocacy and Polling* was presented by **Mary Woolley**, president of Research! America, a nonprofit membership organization supporting grassroots public education and advocacy in the area of health-related research. Woolley reviewed polling data showing that the public regards basic science as important and prestigious work that deserves significantly more public funding than it is getting. Translating public support into actual funding increases, however, requires a greater willingness among scientists to act as advocates and communicators, both to the public and to policymakers and opinion leaders in government. To be more effective in this regard, Woolley concluded that scientists should be more accessible and more accountable; they should be vocally passionate about their work and the good it is doing for society; and they should be willing to lead or participate in orchestrated advocacy campaigns in a wide variety of public forums, from schools to the media.

A panel on *Public Affairs* featured three speakers: **Mary Good** (Venture Capital Investors); **Jon D. Miller** (Northwestern University); and **Skip Stiles**

(former Chief of Staff to Rep. George E. Brown Jr.). The panelists noted several disturbing U.S. trends that necessitate greater advocacy for basic science:

- Dwindling number of science and engineering students,
- Shortage of technically skilled workers,
- Increasing proportion of R&D carried out by industry (which tends to be more applied than basic), and
- Flat rate of growth for physical and engineering research funding as compared to the life sciences.

In response to these and other trends, the panelists made several points, including:

- As citizens and policymakers become better informed about how science is conducted and how it benefits daily life, public support for basic science should grow.
- It is important that scientists overcome their aversion to participating in public outreach and advocacy activities.
- The National Science Board can facilitate a change in the culture of university-based science so that science outreach activities will be rewarded rather than discouraged.
- The status, knowledge, and visibility of the National Science Board places it in a particularly good position to advocate for science and engineering.

A panel on the *Entertainment Industry and News Media* featured David Yarnold (*San Jose Mercury News*); Joanne Rodgers (Johns Hopkins University); and Ira Flatow (National Public Radio). The speakers shared their views of how the public's understanding of science is arbitrated by popular media. They agreed that scientists should reach out to print and broadcast journalists and fashion their messages in simple, clear ways that appeal to the story-telling needs of the media. Science institutions should market themselves more directly to the public without journalists as a conduit, for example, through the development of new web sites or through branding campaigns.

Panelists endorsed conclusions from the Public Affairs panel that universities need to find ways to reward

scientists for participating in public outreach.

In a dinner speech, Elizabeth Daley (University of Southern California) challenged the research community to “learn about media rather than complain about it.” She stressed the importance of understanding the story-telling perspective of journalists and filmmakers. Effective communicators analyze the intended audience and shape the message to meet their needs and interests.

Four speakers participated in a panel on *New Technologies*: David Baltimore (California Institute of Technology); Anita Borg (Institute for Women and Technology); Judy Estrin (Cisco Systems, Inc.); and Jim Mitchell (Sun Microsystems). The speakers noted that the Internet and related technologies have changed virtually every aspect of life, and more change is imminent, including expanded bandwidth, pervasive wireless communications, and collaborative, interactive classrooms and labs. Borg warned that the computer “elite” should not only reach out to the public but should also be ready to listen, thereby ensuring that new technology developments will be informed by the concerns and participation of the many rather than the few. Estrin and others observed that new technologies not only change what we do, but also how we plan for an uncertain future. Questions about privacy and regulation on the web occupied the speakers and several members of the audience, with concern expressed that the commercial need to withhold information conflicts with the academic and Internet traditions of openness.

The symposium concluded with a presentation from Rick Borchelt (Vanderbilt University). Borchelt is Chair of NASA's Research Roadmap for Communication of Science and Technology for the 21st Century Working Group, a 15-member blue-ribbon panel of journalists, scientists, and public relations professionals that is undertaking a three-year study of how science can best be communicated to the public. In addition to collecting “best practices” from the Nation's research institutions, Borchelt's working group is investigating what research has been done, or should be done, in the area of science communication.

Among the Working Group's interim conclusions are:

- There is no such thing as the "general public" — especially with the advent of new media, target audiences have become diffuse and lack the kind of shared assumptions that make mass communication possible.
- When designing programs for public communication, it is important to distinguish whether the goal is greater understanding of science or simply a greater appreciation of science's benefits.
- Scientists and engineers are themselves the best communicators of their work and should be integrated into the communication mix.

March Committee Meeting

At the March 2000 NSB meeting the Committee reviewed material presented at the Symposium and heard from NSF staff about current communication and outreach activities.

Steve Breckler, Acting Division Director for the NSF Behavioral and Cognitive Sciences Division, described ten programs within the Directorate for Social, Behavioral, and Economic Sciences that address communications research. He characterized these

programs as laying a strong foundation for building an understanding of effective communication, and constantly evolving in response to the growth and changes in their respective communities. Breckler asserted that the challenge is translate and utilize basic research for improving the quality and effectiveness of communication and dissemination.

Hyman Field, Senior Advisor for Public Understanding of Research in the Directorate for Education and Human Resources, discussed a new public education effort involving cross-directorate coordination, multi-agency collaboration, and industry partnerships. The objective of this initiative is to inform the public about contemporary research on a regular basis using a wide variety of media outlets.

Mary Hanson, Head of the Media and Public Affairs Section of the NSF Office of Legislative and Public Affairs (OLPA), summarized the wide variety of materials currently being developed and distributed routinely by OLPA to the Congress and to the public.

Jan Stout, Public Affairs Specialist, OLPA, briefly described the membership and the first meeting of the Public Affairs Advisory Group (PAAG).

AGENDA OF THE NSB SYMPOSIUM

*National Science Board Symposium:
Communicating Science and Technology in the Public Interest*

The Arnold & Mabel Beckman Center
Irvine, California
February 2 – 3, 2000

Wednesday, February 2, 2000

10:30 a.m. – 10:45 a.m. *Welcome and Introduction*

Eamon Kelly, Chair, National Science Board
Overview of Symposium Agenda
M.R.C. Greenwood, Chair, Committee on Communication and Outreach

Session Theme:

What We Know: Exploring the External Environment for S&E Communications

10:45 a.m. – 11:15 a.m.

Opening Keynote Address: Public Advocacy and Polling

Introduction: Bob Suzuki, NSB
Presentation: Mary Woolley, President and CEO, Research!America

11:15 a.m. – 11:45 a.m.

Discussion

11:45 a.m. – 1:00 p.m.

Lunch: Refectory, Beckman Center (NSB, DPG, Invited Guests)

1:00 p.m. – 2:00 p.m.

Public Affairs Panel

Moderator: Chang-Lin Tien, NSB
Mary Good, Partner, Venture Capital Investors; Former Chair, NSB
Jon Miller, Vice President, Chicago Academy of Sciences and
Director, Center for Biomedical Communications, Northwestern
University Medical School
Skip Stiles, Consultant; Former chief of staff for Rep. George E.
Brown, Jr., and former legislative director for the House Science
Committee

2:00 p.m. – 2:45 p.m.

Discussion

2:45 p.m. – 3:00 p.m.	<i>Break</i>
3:00 p.m. – 4:00 p.m.	<p><i>Entertainment & News Media Panel</i> <i>Moderator: George Langford, NSB</i> David Yarnold, Senior Vice President & Executive Editor, <i>San Jose Mercury News</i> Joann Rodgers, Director of Media Relations, The Johns Hopkins Medical Institutions Ira Flatow, Host/Executive Producer, “Science Friday,” National Public Radio; News Director, Science and Technology News Network, Sananna Productions, Inc.</p>
4:00 p.m. – 4:45 p.m.	<i>Discussion</i>
4:45 p.m. – 5:30 p.m.	<p><i>General Discussion</i> M.R.C. Greenwood, NSB, Moderator Concluding Remarks: Eamon Kelly</p>
5:30 p.m.	<i>Recess</i>
6:30 p.m. – 9:00 p.m.	<i>Reception & Dinner: Hyatt Newporter Hotel (by invitation)</i>
6:30 p.m. – 7:15 p.m.	<i>Reception</i>
7:30 p.m. – 9:00 p.m.	<p><i>Dinner and Evening Keynote Address</i> Eamon Kelly, Chair NSB, Welcome M.R.C. Greenwood, Introduction Dinner Address: Elizabeth Daley, Dean, School of Cinema-Television, University of Southern California, & Executive Director, Annenberg Center for Communication</p>
<u>Thursday, February 3, 2000</u>	
7:30 a.m. – 8:30 a.m.	<i>Breakfast: Beckman Center (NSB, DPG, Invited Guests)</i>
8:30 a.m. – 12:15 p.m.	<i>NSB Open Session, continued, Lecture Hall</i>
8:30 a.m. – 8:45 a.m.	<p><i>Welcome and Introduction</i> Eamon Kelly, Chair, NSB M.R.C. Greenwood, Chair, NSB Committee on Communication & Outreach</p>

**Session Theme:
Looking Forward – What We See Ahead**

8:45 a.m. – 10:00 a.m.

New Technologies Panel — The Changing Climate for S&E Communications

Moderator: Maxine Savitz, NSB

David Baltimore, President, California Institute of Technology

Anita Borg, President, Institute for Women and Technology

Judy Estrin, Chief Technology Officer, Cisco Systems

Jim Mitchell, Vice President, Sun Microsystems & Director, Sun Laboratories

10:00 a.m. – 10:30 a.m.

Discussion

10:30 a.m. – 10:45 a.m.

Break

**Session Theme:
What Others are Doing – An Example**

10:45 a.m. – 11:15 a.m.

Research on How to Communicate Science and Engineering

Moderator: M.R.C. Greenwood, NSB

Rick Borchelt, Chair of NASA's "Research/Roadmap for Communication of Science and Technology for the 21st Century" Working Group

11:15 a.m. – 11:30 p.m.

Discussion

11:30 a.m. – 12:15 p.m.

Concluding Session

Wrap Up Discussion: M.R.C. Greenwood, Chair, NSB Committee on Communication & Outreach

Concluding Remarks: Eamon Kelly, Chair, NSB

12:15 p.m.

Adjourn



COMMUNICATIONS RESEARCH PROGRAMS WITHIN THE DIRECTORATE FOR SOCIAL, BEHAVIORAL AND ECONOMIC SCIENCES (SBE)

Division of Behavioral and Cognitive Sciences

1. The [Human Cognition and Perception Program](#) supports grants on such topics as organization of memory, how people develop an understanding of concepts, and how current knowledge influences the interpretation and understanding of new information.
2. The [Linguistics Program](#) supports research on how language is involved in the communication of information. Research in this area tells us how characteristics of the speaker and of the listener influence what gets communicated and what gets understood.
3. The [Social Psychology Program](#) funds research on the role of culture and social context in interpersonal and mass communication.
4. [Child Learning and Development](#) is a new program that is building a portfolio of research grants focusing on the cognitive, social, and biological processes related to child and adolescent learning in both formal and informal settings.

Division of Social and Economic Sciences

5. The [Sociology Program](#) supports a number of studies on learning and on public attitudes and perceptions. The General Social Survey, for example, provides a wealth of information about societal attitudes and public opinion.
6. The [Decision, Risk and Management Science Program](#) funds an array of projects on the role of communication in decision making contexts, especially on the communication of risk, and research on how the choice of modality – e-mail, voice, etc. – influences the nature of communication.
7. The [Political Science Program](#) funds research on how communication occurs in workplace and other important daily settings in people's lives, how the mass media are involved in the setting of agendas and the framing of information, and how people process and understand such information.

8. Programs on Societal Dimensions of Engineering, Science, and Technology support research on public understanding of science and technology, and on how scientists communicate their fields to one another and to the public.

9. The Methodology, Measurement, and Statistics Program supports pioneering work on the technology, the methods, and the statistics that are used to measure public attitudes and understanding.

Division of Science Resources Studies

10. The Science and Engineering Indicators Program contributes valuable insight to understanding of science communication with the biennial publication of the *Science and Engineering Indicators Report*. Every volume of *Indicators* includes a chapter on public attitudes toward and understanding of science and technology.



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