SOCIAL, BEHAVIORAL AND ECONOMIC SCIENCES $222,000,000

The FY 2008 Budget Request for the Directorate for Social, Behavioral and Economic Sciences (SBE) is $222.0 million, an increase of $8.24 million, or 3.9 percent, over the FY 2007 Request of $213.76 million.

Social, Behavioral and Economic Sciences Funding

(Dollars in Millions)

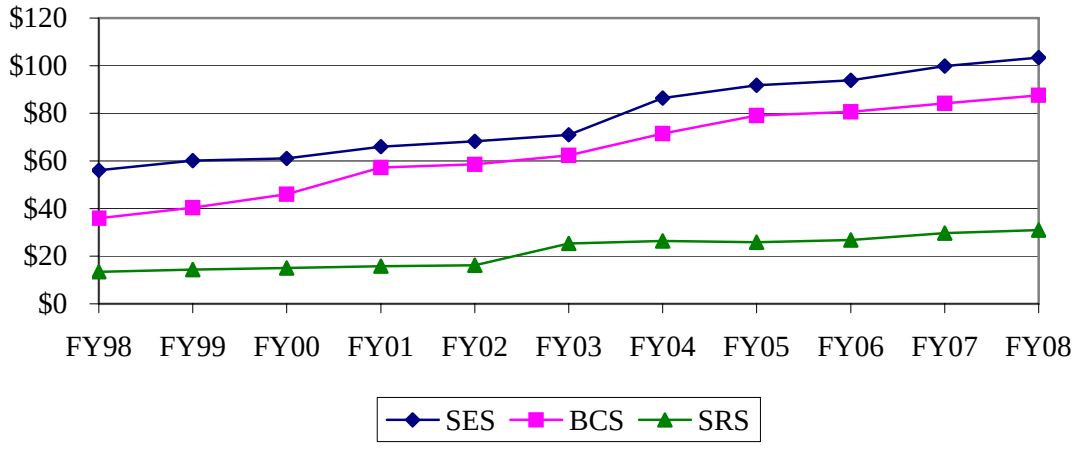
	FY 2006 Actual	FY 2007 Request	FY 2008 Request	Change over FY 2007 Request Amount	Percent
Social and Economic Sciences	$93.84	$99.92	$103.37	$3.45	3.5%
Behavioral and Cognitive Sciences	80.60	84.13	87.63	3.50	4.2%
Science Resources Statistics	26.79	29.71	31.00	1.29	4.3%
Total, SBE	$201.23	$213.76	$222.00	$8.24	3.9%

Totals may not add due to rounding.

The Directorate for Social, Behavioral and Economic Sciences supports research, infrastructure, and education primarily through grants to universities and other institutions. The research supported over the past decades has resulted in substantial advances in our understanding of human and social development; of perception, memory, linguistic, and reasoning processes; of how people behave as individuals and as members of groups and other more formal organizations; and of key social and economic institutions and indicators.

SBE Subactivity Funding

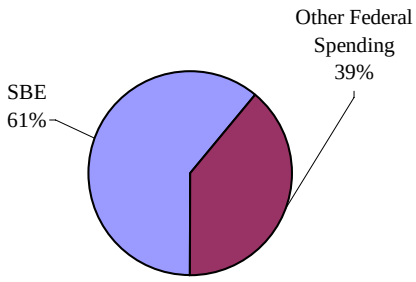
(Dollars in Millions)



RELEVANCE

SBE is a principal source of federal support for fundamental research on human cognition, behavior, social structures, and social interaction, as well as for research on the intellectual and social contexts that govern the development and use of science and technology. Overall, SBE accounts for 61 percent of federal support for basic research in anthropology, social psychology, and the social sciences at U.S. academic institutions. In some fields, including archaeology, political science, linguistics, and non-medical aspects of anthropology, psychology, and sociology, SBE is the predominant or exclusive source of federal basic research support.

Federal Support for Basic Research in Anthropology, Social Psychology, and the Social Sciences at U.S. Academic Institutions



The SBE Directorate supports research and education efforts related to broad Foundation-wide investments through its ongoing funding of work in such areas as humans in the polar regions, science and innovation policy, homeland security, disaster recovery, education and learning, the health of the economy, networking and information technology, ecology, climate change, biotechnology, and nanotechnology. Basic research improves our capacity to assess, prevent, respond to, and recover from terrorist activities and natural disasters. Topics of recently funded research include: brain activity associated with scene recognition, responding to stressors, and interpreting truth versus deception; documenting endangered languages; the influence of fear on perceptions and decision making; network modeling; and the effects of terrorist assaults and natural disasters on people who are directly affected as well as those removed from physical harm but emotionally engaged with the victims. Other recently funded projects investigate the human dimensions of ecological issues, such as climate change and the social and ethical issues that surround advances in nanotechnology.

The American Competitiveness Initiative (ACI) calls for a better understanding of the economic and institutional mechanisms that enable our Nation's workforce to generate and harness scientific and technological developments. SBE's Science of Science and Innovation Policy (SciSIP) activities will develop an evidence-based platform from which policymakers and researchers may assess the impacts of the Nation's science and engineering (S&E) enterprise, and improve their understanding of its dynamics and predict outcomes. Specifically, data collection, research, and community development components of SciSIP's activities will: (1) improve and expand science metrics, datasets and analytical tools, yielding changes in the bi-annual S&E indicators and other data collections; (2) develop usable knowledge and theories of creative processes and their transformation into social and economic outcomes; and (3) build a community of experts in this area across the federal government, industry, and universities. SciSIP will support the development of new data, models, and tools, as well as facilitate transformative research on an immensely policy-relevant topic — the ecology of innovation. SBE is at the forefront internationally on the collection of data on the S&E workforce and research and development statistics. These data, in conjunction with the new theoretical models and analytical tools that will be developed with support from SciSIP, will inform and enhance the success of the ACI. In addition, SBE awards foster the development of new information technology systems and software, the sharing of data within and across disciplines, the development of new cyberinfrastructure-based data extraction techniques, and the development of new social research infrastructures and education at all levels in the SBE sciences.

SBE's Division of Science Resources Statistics (SRS) is the federal statistical agency responsible for the compilation and analysis of data on the S&E enterprise. SRS conducts, analyzes, and disseminates survey results relating to research and development (R&D) funding and facilities, the S&E workforce, and the education of scientists and engineers. SRS also gathers information on the international S&E enterprise and uses available information to describe the U.S. S&E role in a global economy. SRS activities, products, and services provide critical benchmarking information on R&D, the S&E workforce, and the outputs of the S&E enterprise such as patents and scientific publications. SRS provides access to a variety of data on S&E through its website (www.nsf.gov/statistics) and online databases.

Summary of Major Changes by Division ***(Dollars in Millions)***

SBE FY 2007 Request…….…….…….....$213.76

Social and Economic Sciences (SES) +$3.45

Disciplinary and interdisciplinary research in SES increases by $3.45 million for the following research priorities: $1.35 million supports SciSIP research by contributing to the design of new metrics of sciences and related international collaborations; $1.0 million strengthens disciplinary and interdisciplinary research in the SES core that has transformative potential for disciplines within the social and economic sciences; and $1.10 million makes initial Cyber-enabled Discovery and Innovation (CDI) investments through programmatic support for interdisciplinary collaboratories and cybertools research that helps SciSIP.

Behavioral and Cognitive Sciences (BCS) +$3.50

Disciplinary and interdisciplinary research in BCS increases by $3.50 million for the following research priorities: $750,000 supports SciSIP's international research collaborations that promote understanding of discovery and innovation processes in individuals as well as teams; $1.25 million strengthens transformative and collaborative core disciplinary research; and $1.50 million supports research on behavioral and cognitive processes relating to physical systems, brains, and human intelligence.

Science Resources Statistics (SRS) +$1.29

SRS increases by $1.29 million for funding of enhancements to data collections on the S&E workforce, especially work related to postgraduates; beginning work on a module on innovation for industry; and design of new indicators and data on research and development by nonprofits. All of these are significant enhancements directly related to the ACI and SciSIP.

Subtotal, Changes +$8.24

FY 2008 Request, SBE.....$222.00

Summary of Major Changes by Directorate-wide Investments ***(Dollars in Millions)***

SBE FY 2007 Request…….…….…….....$213.76

Discovery Research for Innovation +6.95

Disciplinary and interdisciplinary research
Increased funding will support the following areas:

- *Science of Science and Innovation Policy (+$2.10 million).* $600,000 contributes to SciSIP investment by supporting fundamental research that leads to improved and expanded science metrics, datasets, and analytical tools from which researchers and policymakers may assess the impacts and improve their understanding of the dynamics of the Nation's S&E. The remaining $1.50 million supports international research collaborations that promote global and comparative understanding of the dynamics of science and technology. This investment in SciSIP is supplemented by a $700,000 investment in transformational infrastructure, which is discussed below. In all, SBE's total three-year commitment, which began in FY 2006, is $25.89 million.

- *Strengthening the Core (+$3.75 million).* $2.25 million supports core programs, including potentially transformative research with implications for methods, methodologies, or theories that transcend fields, as well as cross-disciplinary collaborations that include psychological, economic, anthropological, sociological, geographic, and management sciences. An additional $1.50 million will support a special emphasis on research that links behavioral and cognitive processes to related advances in neuroscience. This research focuses on developing new collaborations, approaches, and tools to address issues such as complex pattern recognition, feedback and homeostatic mechanisms, social and motivational processes, action planning and coordination, learning and communication; information integration across multiple modalities; and adaptability and plasticity.

- *Cyber-enabled Discovery and Innovation (+1.10 million).* $1.10 million funds SciSIP's interdisciplinary collaboratories and data extraction research and is supplemented by a Transformational Facilities and Infrastructure investment of $590,000, discussed below, bringing the total investment in CDI to $1.69 million.

Transformational Facilities and Infrastructure +$1.29

$1.29 million will allow SRS to redesign data collections to better reflect how science is conducted in the 21st century and to contribute to the design and development of new science and technology indicators. Of this additional amount of funding:

- $700,000 supports SciSIP (see discussion above); and

- $590,000 supports SciSIP through the investment in Cyber-enabled Discovery and Innovation, as mentioned above.

Subtotal, Changes +$8.24

FY 2008 Request, SBE…….…….....$222.00

NSF-WIDE INVESTMENTS

In FY 2008, the SBE Directorate will support research and education efforts related to broad, Foundation-wide investments in a number of areas, including NSF's multidisciplinary investment areas and the Administration's interagency R&D priorities.

SBE NSF-wide Investments
(Dollars in Millions)

	FY 2006 Actual	FY 2007 Request	FY 2008 Request	Change over FY 2007 Request Amount	Change over FY 2007 Request Percent
Biocomplexity in the Environment	$0.15	$1.08	-	-$1.08	-100.0%
Climate Change Science Program	15.48	15.48	15.48	-	-
Cyber-enabled Discovery & Innovation	-	-	1.69	1.69	N/A
Cyberinfrastructure	20.54	20.54	20.54	-	-
Human and Social Dynamics	31.40	31.40	31.40	-	-
International Polar Year	2.40	5.00	2.00	-3.00	-60.0%
Mathematical Sciences	1.40	0.75	-	-0.75	-100.0%
National Nanotechnology Initiative	1.56	1.67	1.67	-	-
Networking and Information Technology R&D	12.47	12.47	14.47	2.00	16.0%

Biocomplexity in the Environment and **Mathematical Sciences:** With the conclusion of these priority areas in FY 2007, key components of these investments will be retained for core programs. Through collaborations with the Biological Sciences and Geosciences Directorates, SBE is providing core funding to continue support for cross-disciplinary research focused on Coupled Natural and Human Systems. This will continue to foster increased collaborations across the natural, social and behavioral sciences to address complex environmental issues and processes.

Climate Change Science Program (CCSP): Support for CCSP remains level with the FY 2007 Request at $15.48 million. SBE's CCSP investments are concentrated on "Human Contributions and Responses," focusing on how people (individually, in groups, or through organizations) interact with natural environmental systems, and how these interactions affect and are affected by environmental change.

Cyber-enabled Discovery and Innovation: SBE will provide $1.69 million in support of interdisciplinary collaboratories and data extraction research.

Cyberinfrastructure: Cyberinfrastructure support remains at $20.54 million, level with the FY 2007 Request. Substantial investments will be made in major social and behavioral science data collections and will address issues such as confidentiality protections and means for securing worldwide, user-friendly access. Breakthrough technologies, large-scale data capture research in progress, and the capacities of high performance computing will enable SBE sciences to grapple with and model complexity in ways that were heretofore impossible. Continued investments will prepare scientists and educators to use, design, develop, and support cyberinfrastructure with the needs of the SBE sciences in mind.

Human and Social Dynamics (HSD): Support for this SBE-managed priority area totals $31.40 million, unchanged from the FY 2007 Request. Almost every major challenge this country faces, ranging from climate change, to terrorism, to the need for an educated, diverse, and innovative workforce, has at its

core important human and social dynamics. HSD builds upon unprecedented opportunities for fruitful synergies across the social and behavioral sciences and other fields of sciences and engineering, by supporting multidisciplinary approaches to understanding the complex dynamics involving human and social systems and their environments, at scales ranging from cellular to global and from nanoseconds to millennia. HSD aims to increase our ability to anticipate the complex consequences of change to understand the cognitive and social structures that create and define change and to help people and organizations manage profound or rapid change. HSD used the Small Grants for Exploratory Research mechanism to provide funding rapidly to interdisciplinary teams seeking to study social, behavioral and organizational aspects of the response to natural disasters such as Hurricane Katrina. The knowledge gained from this type of research will better inform our ability to anticipate and respond to future events.

International Polar Year (IPY): SBE will participate in IPY activities through collaboration with the Office of Polar Programs for a total of $2.0 million. Although SBE is reducing its participation by $3.0 million, it will continue to augment its IPY investments through related core activities. Through its "gold-standard" General Social Survey (GSS), SBE provided a survey vehicle for IPY specific questions in 2006 that addressed Americans' knowledge of the polar regions. SBE plans to continue this series of questions in future GSS cycles so as to provide longitudinal data on this topic. The FY 2008 resources will support interdisciplinary, and where appropriate, international research on human adaptation and change within polar environments that focus on human-environment interactions from a range of perspectives, including physical anthropology, cultural anthropology, cognitive neuroscience, sociology, geo-political relations, and economics, as well as science and technology studies. Human adaptations reflected in native languages and cultures will be documented. Social and economic aspects of nutrition, mental well-being, and infectious diseases will also be examined.

National Nanotechnology Initiative (NNI): This priority area support is maintained at $1.67 million. SBE's support for NNI enables research and educational activities that focus on issues of nanotechnology R&D and societal consequences, on both a domestic and global scale. This will enable continuing interdisciplinary participation in NSF-wide nanotechnology areas.

Networking and Information Technology R&D (NITRD): NITRD funding increases $2.0 million over the FY 2007 Request, for a total of $14.47 million. SBE's major investments in NITRD will continue to support (1) the social, economic and workforce aspects of Information Technology (IT), focusing on the nature and dynamics of IT impacts on technical and social systems; and (2) human-computer interaction and information management to increase the benefit of computer technologies to scientists as well as non-science users.

QUALITY

SBE maximizes the quality of R&D it supports through the use of a competitive, merit-based review process. In FY 2006, the last year for which complete data exist, 95 percent of research funds were allocated to projects that underwent external merit review.

To ensure the highest quality of processing and recommending proposals for award, SBE convenes Committees of Visitors (COVs), composed of qualified external evaluators, to review each program every three years. These experts assess the integrity and efficiency of the proposal review process and provide a retrospective assessment of the results of NSF's investments.

The directorate also receives advice from the Advisory Committee for the Social, Behavioral and Economic Sciences (SBEAC) on the missions, programs, and goals that best serve the scientific

community; the promotion of quality graduate and undergraduate education in the social, behavioral, and economic sciences; and priority investment areas for research. The SBEAC meets twice a year and its Chair regularly consults with the SBE Assistant Director. Members represent a cross section of supported disciplines, with representatives from many sub-disciplines and members from academic institutions and industry. SBEAC includes women, underrepresented groups, and people from all geographic regions.

PERFORMANCE

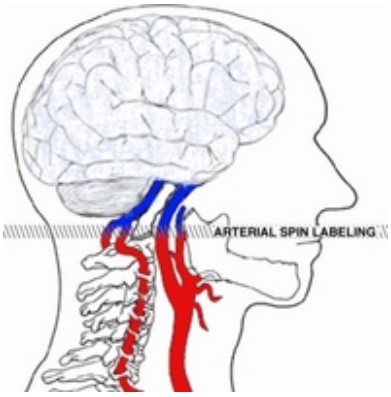
The FY 2008 Budget Request is aligned to reflect funding levels associated with the Foundation's four strategic outcome goals stated in the FY 2006-2011 Strategic Plan. These goals provide an overarching framework for progress in fundamental research and education and facilitate budget and performance integration.

Social, Behavioral and Economic Sciences
By Strategic Outcome Goal
(Dollars in Millions)

	FY 2006 Actual	FY 2007 Request	FY 2008 Request	Change over FY 2007 Request Amount	Change over FY 2007 Request Percent
Discovery	$156.04	$156.39	$163.34	$6.95	4.4%
Learning	8.88	9.27	9.27	-	-
Research Infrastructure	33.59	44.30	45.59	1.29	2.9%
Stewardship	2.72	3.80	3.80	-	-
Total, SBE	$201.23	$213.76	$222.00	$8.24	3.9%

Totals may not add due to rounding.

Recent Research Highlights



The continuous arterial spin labeling (CASL) method is very similar to positron emission tomography (PET) scanning but does not require injections or radioactivity. To measure blood flow in the brain, the technique uses a functional magnetic imaging (fMRI) magnet to "tag" water molecules in the patient's blood, which then serve as a natural contrast agent. *Credit: University of Pennsylvania School of Medicine.*

► **A New Method for Measuring Effects of Stress on the Brain:** John Detre and his colleagues at the University of Pennsylvania are developing and testing improved functional magnetic resonance imaging (fMRI) methods for visualizing human brain function. As in conventional fMRI studies, these methods estimate the amount of neural activity at any given point in the brain by measuring how fast the blood is flowing there – quantities that turn out to be closely linked. Unlike the conventional studies, which measure the blood flow by indirect means, Detre and his coworkers are measuring blood flow directly with a technique called continuous arterial spin labeling (CASL). In effect, they magnetically "tag" the water molecules in a person's blood on its way to his or her brain.

As a demonstration, the researchers used CASL on individuals subjected to mental stress in the form of a demanding mental arithmetic task. They detected an increase in blood flow in the right prefrontal cortex, which is where such tasks are carried out. Moreover, they found that the change continued even after the task was completed, suggesting that the effects of a transient mental stressor are more persistent than commonly thought. Improvements in perfusion MRI for measuring changes in brain function could yield superior sensitivity to conventional fMRI methods for measuring prolonged

cognitive or emotional states such as those imposed by mental stress. (BCS).

► **"Thinking Like A Scientist" Helps Underrepresented Youth Use Science in the Real World:** High-school science courses traditionally focus on a subject's content – genes in biology, for example, or the periodic table in chemistry. Yet many studies have shown that students quickly lose interest in such courses. They find the material abstract, lifeless, and irrelevant. They quickly forget what they have learned. Even when they do not forget, they have a great deal of trouble transferring their knowledge to new problems, situations, or domains.

Now, however, Cornell University psychologist Wendy M. Williams has developed a program that explicitly teaches high-school students how to use the problem-solving methods of science to deal with situations they encounter in daily life. Williams' "Thinking Like A Scientist" program is designed to be taught by regular science teachers who assign tasks and quizzes that reinforce its themes. Their basic strategy is to talk about everyday topics, while simultaneously smuggling in principles of effective thinking using the scientific method.

Williams tested this approach on 400 students from high schools in North Dakota, Arizona, Alabama, Iowa, and New York, with additional trials in summer school and after-school venues in other states. The results showed success in virtually all groups. That success, in turn, suggests that underrepresented youth may have competencies in science that are not brought out by traditional science instruction. (BCS).

► **Including Public Attitudes in Wetland Restoration Priority Setting:** To assist managers in assessing the tradeoffs among different wetland restoration projects, an interdisciplinary team at the University of Rhode Island has developed a method to estimate the public benefits of each one. The team, which included both social scientists and natural scientists, worked in close collaboration with state officials. They first linked how the physical attributes of wetlands contribute to habitat functions for various species, and then identified public values associated with changes in salt marsh functions. Public values were assessed regarding habitat, mosquito control, recreational access, and cost.

Table 1. Species Groups in Restoration Assessment Methodology

Species Group:	Example Species:
Wading birds:	Egrets, herons
Waterfowl	Ducks, geese, swans
Shorebirds:	Killdeer, plovers, sandpipers
Marsh dependent songbirds:	Seaside sparrows, sharptail sparrows
Other songbirds:	Thrushes, warblers
Marsh resident fish:	Killifish, mummichogs, silversides, sticklebacks
Marsh non-resident fish:	Bluefish, menhaden, mullet, striped bass, flounder
Shellfish	Clams, crabs, mussels, oysters, scallops, snails

Credit: Table courtesy of James Opaluch.

Based on their results, the team created a web-based application (http://simlab.uri.edu/saltmarsh/) that can be used by decision makers and the public to assess and prioritize restoration actions. All sites are existing wetlands that were subject to various impacts, such as ditching, impoundment, disposal of dredge spoils, runoff from development, erosion, and sedimentation. (BCS).

► **Summer Economics Training Program Reaches Minority and Disadvantaged Students:** The American Economics Association's summer training program has been continuously successful in providing American minority students and students from disadvantaged backgrounds with coursework and research experience in preparation for graduate study in economics. Overall, the program is likely to increase the long-term supply of minority economists by at least 25 percent.

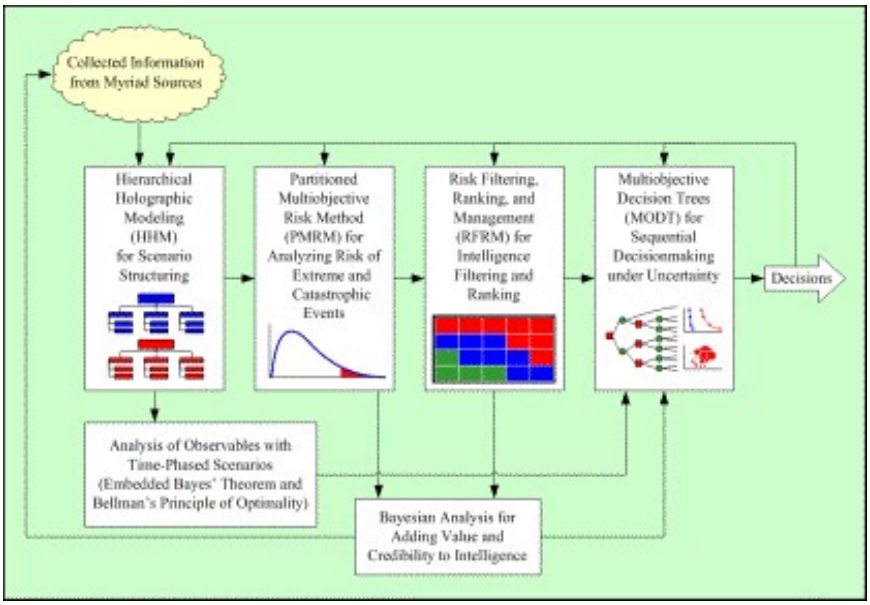
The program recruits overwhelmingly from non-research institutions with predominantly minority and low-income student bodies. The 2005 program had 39 students from 37 colleges or universities in 24 states. In the program's two years at Duke University, 44 percent of the participants were female, 55 percent were African American, and 31 percent were Hispanic.

AEA summer training program participants in the Federal Reserve boardroom. *Credit: Prof. Charles Becker, Director, AEA Summer Training Program.*

When students were surveyed at the end of the 2005 summer, about four in five of those who completed the program indicated they were either certain or very likely to enter a Ph.D. program in economics, compared to just over half of the students surveyed at the beginning of the summer. Of the 132 participants during the period 2001-2005, 57 students are expected to be enrolled in a Ph.D. program during the 2006-2007 academic year. (SES).

► **A Scenario-based Method for Identifying Terrorism Targets:** Yacov Haimes and his colleagues at the University of Virginia have developed a scenario-based "game" for identifying and prioritizing security vulnerabilities related to critical infrastructure. The game is built around an interactive, multidimensional analysis method called the hierarchical holographic method (HHM) developed by the same team.

The team has refined and extended this innovative risk-assessment methodology by working on real terrorism-assessment problems. By combining research and development with application studies, the risk assessment method is simultaneously tested, improved and used to help solve a pressing national problem.



The Methodological Framework: A process for scenario-based tracking used to identify and prioritize security vulnerabilities of critical infrastructure. *Credit: Yacov Haimes, University of Virginia.*

Working with the Virginia Department of Transportation, the researchers have used the game to identify security vulnerabilities around a gubernatorial inauguration. Additionally, working with the Department of Homeland Security, they have used it to aid decision analysis associated with the department's color alert system. They have also analyzed risks to U.S. Army critical infrastructure to help prioritize protection of critical army assets. (SES).

► **Improvements in NSF's Survey of Industrial Research and Development:** The National Science Foundation's Science Resources Statistics program is in the midst of a major redesign of its Industrial Research and Development Survey to better reflect how research and development (R&D) is conducted in

the 21st century. The redesign was emphasized as a major priority in the NRC report, *Measuring Research and Development Expenditures in the U.S. Economy.*

The Survey is the primary source of information on R&D performed by industry in the United States and is widely used by government agencies, corporations, and research organizations. In its redesigned form, it will be a major analytical tool helping to inform policymakers in support of the ACI. One unique aspect of the redesign is an extensive series of interactions with survey respondents and data users. Over 40 recordkeeping visits to a broad range of companies have already been carried out, with many additional visits expected as the redesign continues. In addition, an Industry Experts Panel, composed of major industrial leaders, held three meetings to advise on the development of the survey and subsequent meetings will be held as the redesign progresses. Extensive data-user meetings and workshops have been held to ensure that the redesigned survey meets user needs. (SRS).

Other Performance Indicators

The tables below show the estimated number of people benefiting from SBE funding, trends in award size and duration, number of awards, and funding rates.

Number of People Involved in SBE Activities

	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate
Senior Researchers	3,033	3,100	3,150
Other Professionals	453	475	500
Postdoctorates	196	200	210
Graduate Students	1,661	1,650	1,675
Undergraduate Students	1,208	1,220	1,220
K-12 Teachers	10	10	10
Total Number of People	6,561	6,655	6,765

SBE Funding Profile

	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate
Statistics for Competitive Awards:			
Number	1,145	1,215	1,265
Funding Rate	25%	25%	25%
Statistics for Research Grants:			
Number of Research Grants	713	760	790
Funding Rate	22%	22%	22%
Median Annualized Award Size	$85,136	$86,000	$86,000
Average Annualized Award Size	$102,527	$103,000	$103,000
Average Award Duration, in years	2.4	2.4	2.4

SOCIAL AND ECONOMIC SCIENCES $103,370,000

The FY 2008 Budget Request for the Division of Social and Economics Sciences (SES) is $103.37 million, an increase of $3.45 million, or 3.5 percent, over the FY 2007 Request of $99.92 million.

Social and Economic Sciences Funding

(Dollars in Millions)

	FY 2006 Actual	FY 2007 Request	FY 2008 Request	Change over FY 2007 Request Amount	Change over FY 2007 Request Percent
Social and Economic Sciences	**$93.84**	**$99.92**	**$103.37**	**$3.45**	**3.5%**
Major Components:					
Research and Education Projects	93.84	99.92	103.37	3.45	3.5%

Totals may not add due to rounding.

About SES:

The Division of Social and Economic Sciences supports research and related activities, conducted within the U.S. and globally, to improve systematic understanding of political, economic, and social institutions and how individuals and organizations behave within them. It also supports research and other activities related to risk assessment and decision making by individuals and groups; the nature and development of the various sciences and technologies and their implications for society; methods and statistics applicable across the social, economic, and behavioral sciences; scholarly career development; and broadening participation in the social, behavioral, and economic sciences. Its programs include the established disciplines of economics, political science, and sociology, and such vibrant interdisciplinary fields as decision making and risk, law and social science, and science and technology studies. In many of its program areas, SES is the major (sometimes only) source of federal funding for fundamental research, and SES is a principal investor in the data resources and methodological advances that produce transformative research.

In general, 52 percent of the SES portfolio is available for new research grants. The remaining 48 percent is used primarily to fund continuing grants made in previous years. SES supports research and education through grants that range in size from small supplements for undergraduates to collaborate with faculty on research projects to multi-million-dollar survey awards such as the *Panel Study of Income Dynamics*, the *American National Elections Studies*, and the *General Social Survey*. These are national resources for research and decision making that have become models for similar efforts in other societies.

SES is strengthening these surveys through investments in cyberinfrastructure that increase response rates, improve quality, and shorten the time required to design, field, and analyze questionnaire surveys. The Time-sharing Experiments for the Social Sciences (TESS) uses the internet as a medium for conducting survey-based experiments. Not only does TESS allow innovative research design, it also widens access to high-quality survey data and lowers the research costs for participating investigators.

SES contributes to Foundation-wide efforts to understand the ethical, legal, and social dimensions of science, engineering, and technology by coordinating the Ethics Education in S&E Program, by supporting (with other NSF directorates) the Online Ethics Center for Engineering and Science, and by taking a lead role in managing the Centers for Nanotechnology in Society. These collaborative activities

contribute to the education of scientists and engineers and shape the trajectory of research and development.

SES Priorities for FY 2008:

- Assume a major role in the development of SciSIP to improve understanding of the research and innovation processes and to design better metrics of science. Investments will initiate fundamental research into the organization and dynamics of science and innovation, with special attention to their implications for science metrics. Funds will also be used to strengthen international collaborations among researchers concerned with science and innovation dynamics, metrics and policies.
- Strengthen core social science programs through targeted investments in potentially transformative research areas. Within these sciences, SES will increase support for research that uses or develops qualitative and quantitative methods and for research concerned with knowledge production and the process of innovation.
- Support research in Cyber-enabled Discovery and Innovation that will build a foundation for SciSIP. Computers and related technologies applied to new data resources provide analytic access to cognitive and social phenomena that had been invisible and unmeasured. New cybertools and institutional arrangements for organizing and analyzing such data will offer new insights into the processes of knowledge production and innovation.

Changes from FY 2007:

Support for the SES Division increases by $3.45 million:

- $1.35 million will support SciSIP research contributing to the design of new metrics of science ($600,000) and related international collaborations ($750,000). These investments will initiate fundamental research into the organization and dynamics of science and innovation, and will contribute to the development of new metrics of science. Funds will also be used to start and strengthen international research collaborations concerned with science and innovation.
- $1.0 million will strengthen fundamental research in core programs that has transformative potential for the social and economic sciences. SES will give particular emphasis to the development and use of new qualitative and quantitative methods and to studies of the production, dissemination, and use of knowledge.
- $1.10 million will make initial CDI investments through programmatic support for interdisciplinary collaboratories and cybertools that extract and organize data from large-scale qualitative databases. New computer and communications technologies, applied to newly-created data resources, will reveal patterns of behavior that had been invisible, unmeasured, and unexamined.

BEHAVIORAL AND COGNITIVE SCIENCES $87,630,000

The FY 2008 Budget Request for the Division of Behavioral and Cognitive Sciences (BCS) is $87.63 million, an increase of $3.50 million, or 4.2 percent, over the FY 2007 Request of $84.13 million.

Behavioral and Cognitive Sciences Funding
(Dollars in Millions)

	FY 2006 Actual	FY 2007 Request	FY 2008 Request	Change over FY 2007 Amount	Change over FY 2007 Percent
Behavioral and Cognitive Sciences	**$80.60**	**$84.13**	**$87.63**	**$3.50**	**4.2%**
Major Components:					
Research and Education Projects	80.60	84.13	87.63	3.50	4.2%

Totals may not add due to rounding.

About BCS:

The Division of Behavioral and Cognitive Sciences supports research and related activities that advance fundamental understanding in the behavioral, cognitive, anthropological, and geographic sciences. The division seeks to develop and advance scientific knowledge and methods focusing on human cognition and behavior including perception, thought processes, language, learning, and social behavior across neural, individual, family, and group levels. The division supports research and related activities that focus on human variation at the scales of society, culture, and biology as well as how these variations and related patterns develop over time. The division also supports efforts to increase basic understanding of and capabilities to explore geographic distributions and relationships, with an emphasis on interactions of human, physical, and environmental systems on the Earth's surface. Strong core programs are complemented by active involvement in competitions that support collaborative and cross-disciplinary projects to advance knowledge and build capacity by bridging multiple fields.

In general, 62 percent of the BCS portfolio is available for new research grants. The remaining 38 percent is used primarily to fund continuing grants made in previous years. The BCS portfolio mainly supports research and education grants ranging in scope from dissertation and individual-investigator awards to larger group projects that span multiple disciplines and institutions. Major activities include:

- Understanding fundamental human processes including language, cognition, perception, reasoning, and action planning, in relation to adult and childhood developmental processes;
- Providing fundamental understanding of human social behavior including attitude formation and change, social cognition, affective and motivational influences, and personality processes;
- Integrating qualitative and quantitative analyses to better understand cultures;
- Understanding human biological variation, human adaptation, and human ontology;
- Using a geographic framework for understanding social, political, and economic transformations;
- Facilitating research to address the complexity in human-environmental interactions;
- Using non-linear models to understand dynamics of human behavior on time scales from the momentary to the millennial; and
- Creating platforms for annotating and archiving textual, audio, and video language samples, as well as accessing the material for analyses.

Within BCS, there is a continuing emphasis on integrating findings from multiple perspectives to elucidate how human beings think, learn, and behave as individuals and as members of various socially and culturally-defined groups. Through support of basic research, the behavioral and cognitive sciences are advancing knowledge of the relations between brain and thought processes, between individual differences and cultural contexts, and between human and environmental systems. As examples, BCS research is helping us to prepare for and mitigate the effects of natural and manmade disasters, to predict and address how people respond to stressors, to improve methods for effective learning, to enhance the quality of social interaction, and to respond to issues such as globalization, terrorism, and climate change.

Ongoing initiatives within BCS include human and social dynamics, documenting endangered languages, understanding child learning, studying human origins, and understanding the interplay between humans and the environment. Cyberinfrastructure investments will continue to provide significant opportunities for breakthroughs in cognitive and behavioral sciences. New methods are transforming how we understand the links between behavior, cognition, and their biological substrates. These advances are strengthening the core programs and their relations to each other.

BCS Priorities for FY 2008:

- Participate in the development of SciSIP to increase understanding of the discovery and innovation processes, with special emphasis placed on cognitive, affective and motivational processes that enhance creativity and innovative thinking; improved measurements of psychological outcomes such as success, well-being, and satisfaction; and identification of group processes that facilitate idea generation, team coordination, and translation into successful applications. These efforts will bring together international collaborative teams to advance fundamental knowledge regarding how discoveries are encouraged, nourished and disseminated.
- Strengthen the basic research enterprise and encourage transformative research in the behavioral, cognitive, anthropological, and geographic sciences through enhancement of the support provided to core programs that serve these critical research communities. In particular, BCS will emphasize additional funding in areas that are expanding in new directions and increasing cross-disciplinary interactions such as social cognition and human-environment interactions.
- Advance understanding about the interplay among physical systems, brains, and human intelligence, with research focused on developing new collaborations, approaches, and imaging techniques to discover the brain mechanisms involved in the cognitive functions of language, perception, memory, emotion, etc.

Changes from FY 2007:

Support for the BCS Division increases by $3.50 million:

- $750,000 supports international research collaborations as part of the SciSIP activity to promote fundamental understanding of discovery and innovation processes in individuals and teams.
- $1.25 million strengthens core disciplinary research to enhance the number of transformative projects in areas that expand in new directions and increase cross-disciplinary interactions.
- $1.50 million supports research on cognitive and behavioral processes associated with physical systems, brains, and human intelligence, including research on language, learning, social processes, cognition, and higher-order perception.

SCIENCE RESOURCES STATISTICS $31,000,000

The FY 2008 Budget Request for the Division of Science Resources Statistics (SRS) is $31.0 million, an increase of $1.29 million, or 4.3 percent, over the FY 2007 Request of $29.71 million.

Science Resources Statistics Funding
(Dollars in Millions)

	FY 2006 Actual	FY 2007 Request	FY 2008 Request	Change over FY 2007 Amount	Change over FY 2007 Percent
Science Resources Statistics	**$26.79**	**$29.71**	**$31.00**	**$1.29**	**4.3%**

About SRS:

The legislative mandate for the Division of Science Resources Statistics as stated in the National Science Foundation Act of 1950, as amended, is "…to provide a central clearinghouse for the collection, interpretation, and analysis of data on scientific and engineering resources and to provide a source of information for policy formulation by other agencies of the Federal Government…." To meet this mandate, SRS, in its role as a federal statistical agency with responsibility to cover the S&E enterprise, provides policymakers, researchers, and other decision makers with high quality data and analysis for making informed decisions about the Nation's science, engineering, and technology enterprise. The work of SRS involves survey development, methodological and quality improvement research, data collection, analysis, information compilation, dissemination, web development and customer service to meet the statistical and analytical demands of a diverse user community, as well as preparation of the congressionally mandated *Science and Engineering Indicators* and *Women, Minorities and Persons with Disabilities in Science and Engineering* biennial reports. The data collected by SRS serves as an important tool for ACI.

The funding portfolio for SRS includes ongoing, cyclical surveys, reports, and projects accomplished primarily through contracts and also a few standard grants. Funding is provided annually; SRS makes limited use of multi-year commitments. In FY 2008 SRS will:

- Continue to conduct surveys and engage in analytic activities that produce information for carrying out NSF's statutory mandate, for meeting NSF strategic goals, and for developing *Science and Engineering Indicators* and *Women, Minorities and Persons with Disabilities in Science and Engineering*. In FY 2008, SRS will continue activities designed to improve the relevance and quality of the data it collects and the information it disseminates. Such activities will lead to further quality improvements and additions to current activities in subsequent years.
- Significantly improve the *Survey of Graduate Students and Postdoctorates in Science and Engineering* with further implementation of redesigned survey components after significant testing.
- Continue collection and dissemination of breakthrough data collections on cyberinfrastructure in academic and biomedical facilities. Data were first collected in FY 2004 and similar data with an updated questionnaire will go into the field in FY 2008, collecting data covering parts of 2006-2009.
- Maintain continuous improvement in the relevance and quality of all its products. In FY 2008, SRS will implement the results of prior methodological, analytical, and planning activities directed toward improving the quality, relevance, timeliness, and accessibility of all SRS products, including implementing redesigns/improvements to major components of many SRS surveys and continuing to explore the feasibility of new information collection efforts begun in prior years to meet the needs of the ACI, SciSIP, and a broad range of data users.

- SRS is responsible for the major data components of SciSIP. In support of SciSIP and ACI, in FY 2006 and FY 2007 SRS held a series of workshops with Industry and S&E workforce experts, data users and innovation experts. These workshops have significantly enhanced the redesigns underway for the SRS surveys and additional workshops will be held in FY08.
- Enhance and expand existing on-line systems for user access to SRS data and the SRS database archive to support the SciSIP initiative. Continue efforts to enhance information on the globalization of the S&E enterprise, through continued interaction with OECD, EUROSTAT, the UNESCO Institute for Statistics and other international and national statistical agencies.
- Continue the redesign of the Academic Research and Development Survey so it reflects the major changes that have occurred and are taking place in the academic sector as to how research and development are funded and conducted.

SRS Priorities for FY 2008:

As the federal statistical agency responsible for data on the U.S. S&E enterprise, SRS will:

- Continue dissemination of data from the 2006 cycle of data collections for the *National Survey of College Graduates, National Survey of Recent College Graduates,* and the *Survey of Doctorate Recipients* and plan the 2008 surveys, which will begin data collection in October 2008. Data from the three surveys comprise the Scientists and Engineers Statistical Data System (SESTAT), the primary source of statistical data on the S&E workforce.
- Develop plans, based on pilot activities in FY 2007, for data collection activities to gather information about individuals in postdoctorate positions, including individuals with foreign doctorates.
- Complete and release the *2008 Science and Engineering Indicators* report. Plan and develop the *2009 Women, Minorities and Persons with Disabilities in Science and Engineering* report, including updates to the web version of the report as new data become available.
- Continue work with the Census Bureau and Office of Management and Budget to add a field of degree item to the *American Community Survey* to facilitate sampling for the *National Survey of College Graduates* in the next decade and enhance analysis of the occupations and income of those with S&E degrees. Final decisions on the format of the question will be made as well as analytical plans for the data. The question will provide ongoing data on the size and characteristics of the S&E workforce and important critical data on inflows of foreign science and engineers.
- Major progress will be made on redesigning the *Survey of Industrial Research and Development* (*SIRD*). Following extensive data user and supplier interactions, final decisions will be made on content and preliminary drafts of the questionnaire will be developed. Plans for procedures, methods and development of the pilot design will be underway.

Changes from FY 2007:

Funding increase of $1.29 million to a total of $31.0 million is for work connected with the SciSIP:

- Use $590,000 under the CDI Investment area to design a module on innovation to be used in conjunction with the Survey of Industrial Research and Development. SRS will draw upon input from practitioners in the field of innovation to develop a very small module to provide much needed innovation data.
- Use $700,000 for design and development of new indicators related to R&D funded and conducted by nonprofit institutions. A major component of SciSIP is to provide the data for an enhanced understanding of how research is conducted in the United States.